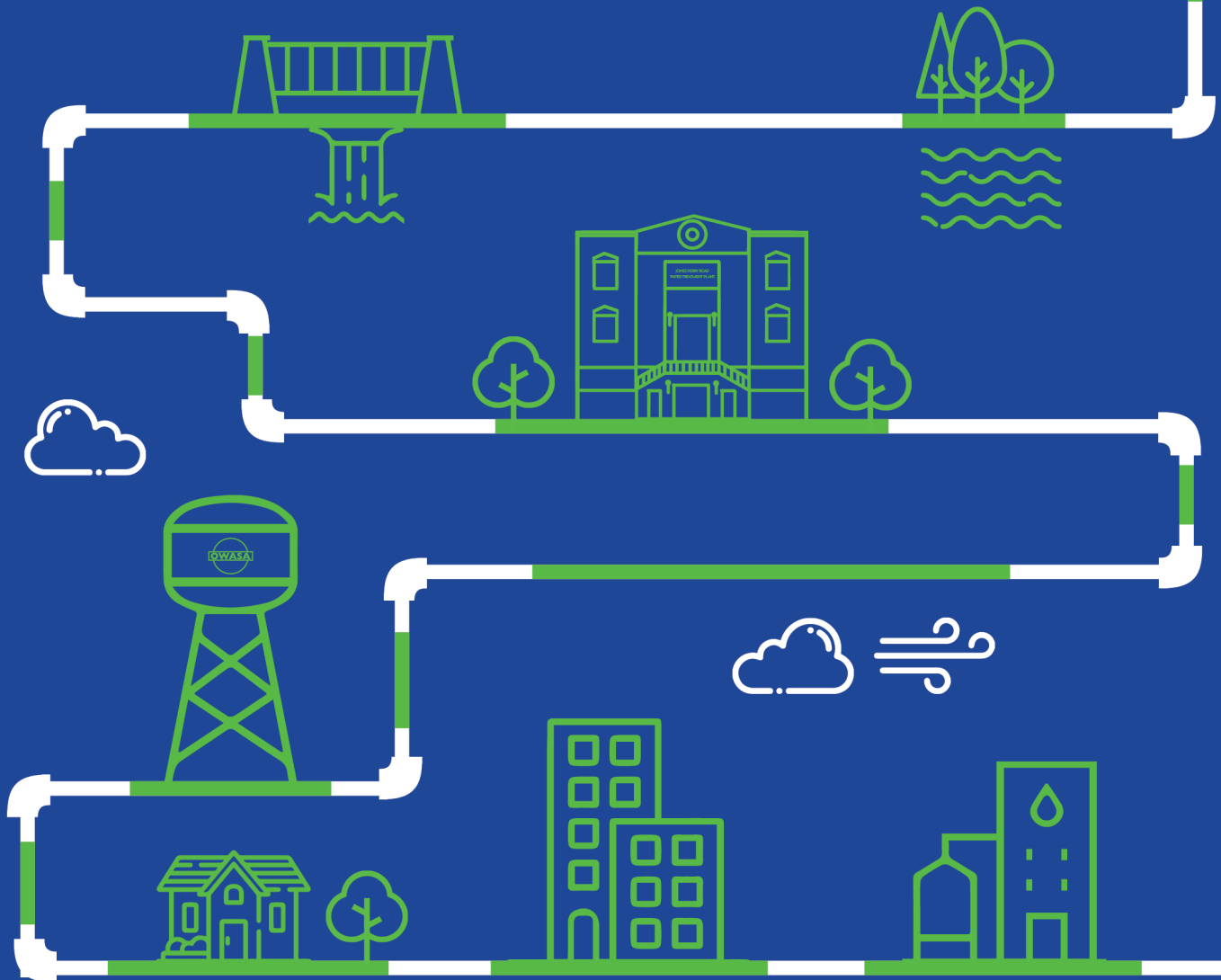


# Capital Improvements Program



FISCAL YEARS 2024 - 2028



ORANGE WATER AND SEWER AUTHORITY

*OWASA is Carrboro-Chapel Hill's not-for-profit public service agency delivering high quality water, reclaimed water, and wastewater services.*



## Orange Water and Sewer Authority

OWASA is Carrboro-Chapel Hill's not-for-profit public service agency delivering high quality water, wastewater, and reclaimed water services.

### **Subject: Capital Improvements Program for Fiscal Years 2024-2028**

I am pleased to present the Capital Improvements Program (CIP) for Fiscal Years 2024-2028.

The CIP is the culmination of an annual process of capital needs assessment and prioritization completed as part of OWASA's [Asset Management Program](#). This five-year CIP outlines an approximately \$154 million plan for the community's investment in its water, wastewater, and reclaimed water infrastructure and represents OWASA's commitment to providing high quality and reliable service into the future.

The CIP includes over \$17 million for replacement of approximately 6.3 miles of aging water mains and other improvements for the water distribution system, \$26 million for the evaluation, rehabilitation, and upsizing of approximately 15.4 miles of wastewater collection (sewer) mains and pump stations, \$68 million for rehabilitation and upgrade work at our water treatment plant (WTP), \$14 million for our wastewater treatment plant (WWTP) and wastewater pumping facilities, and \$24 million for our water supply reservoirs (including OWASA's participation in the Western Intake Partnership projects), along with \$5 million for the rehabilitation or replacement of other operations facility assets and buildings. In contrast to prior year's CIPs, the vast majority of the FY 2024-2028 CIP is dedicated to the enhancement of existing infrastructure (roughly 77% for the five-year period), as opposed to system rehab (6%), or system growth (16%). This change from prior years is largely driven by the large dollar values for the planned treatment upgrades needed at the water treatment plant (WTP) to comply with new regulations along with the participation in the Western Intake Partnership.

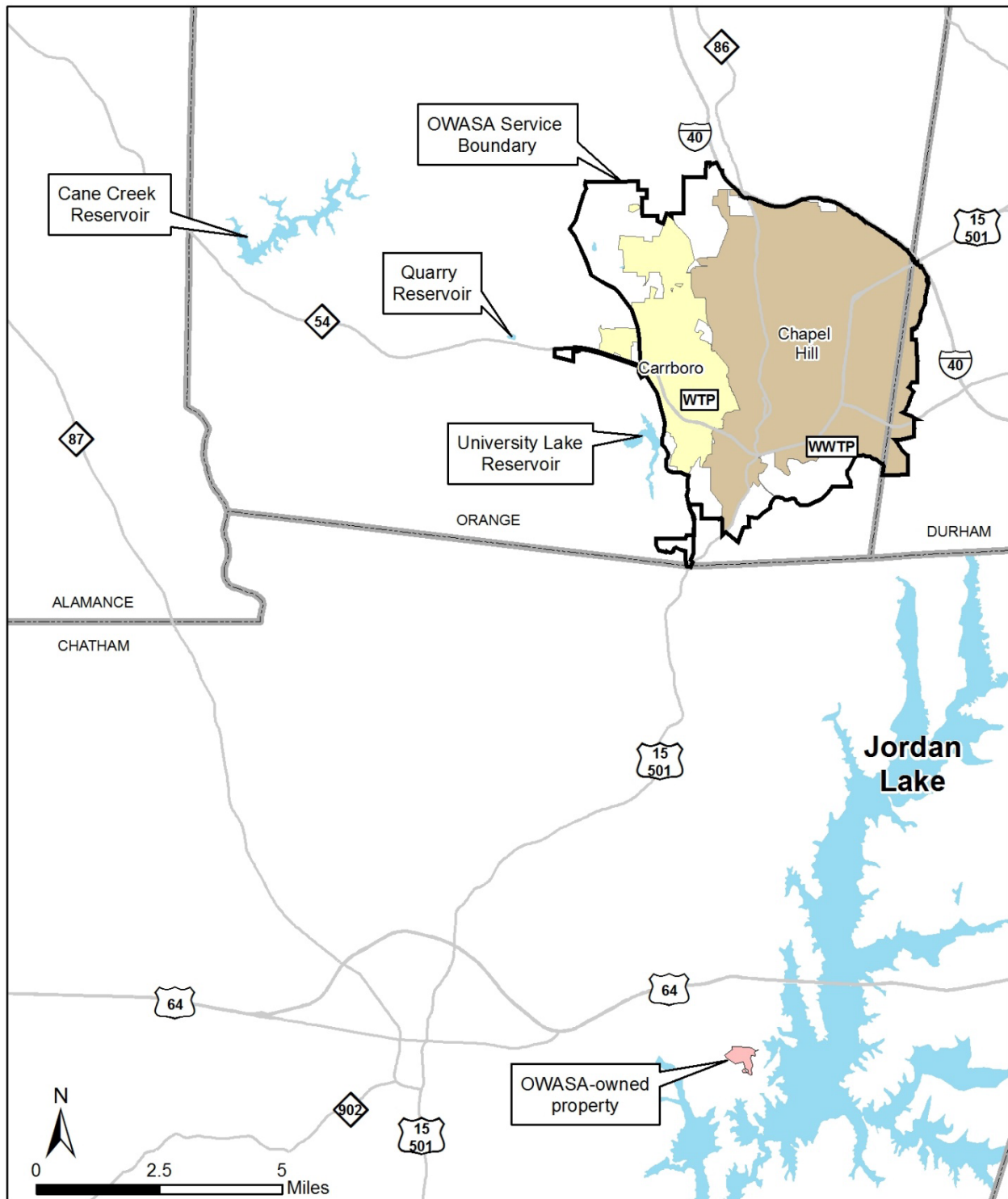
As implied by the subtotals above, renewal and upgrade of water treatment facilities is a major focus of the CIP, and the upcoming years will see major improvements and treatment additions at the Jones Ferry Road Water Treatment Plant. Additionally, there will be water main replacement projects along Rosemary Street, the Briarcliff and Ridgefield neighborhood, and other neighborhoods throughout the service area. Furthermore, there will be capacity improvements along the Morgan Creek Interceptor. Other notable projects in this CIP include supervisory control and data acquisition (SCADA) system improvements at the WTP and wastewater treatment plant (WWTP), and major process improvements at the WWTP.

The CIP also includes funding for various needs assessments and planning efforts used to evaluate asset risks and to determine future capital investments required for the water distribution system, the wastewater collection system, water treatment plant, and the wastewater treatment plant.

The level of investment presented in this CIP leaves OWASA well-positioned to remain the sustainable, responsible, and environmentally-focused organization that our community deserves and has come to expect.

Allison Marie Spinelli, P.E.  
Engineering Manager – Capital Projects

## Orange Water and Sewer Authority Service Area and Raw Water Supplies



**OWASA Capital Improvements Program  
Fiscal Years 2024 - 2028  
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# **Orange Water and Sewer Authority**

## **Capital Improvements Program and Budget**

### **Fiscal Years 2024-2028**

#### **Objective**

This document summarizes OWASA's long-range Capital Improvements Program (CIP) and Budget for the 5-year period including Fiscal Years (FY) 2024 through 2028. Its objective is to help guide OWASA's efforts to meet the community's evolving needs for sustainable, reliable, and high-quality water, wastewater (sewer), and reclaimed water services.

#### **Background**

OWASA is a public, non-profit water, wastewater, and reclaimed water agency established in 1977 to serve the Carrboro-Chapel Hill community. OWASA's service area is defined as the Urban Services Area delineated by the Water Sewer Master Planning Boundary Agreement boundary adopted by Orange County and the towns of Carrboro and Chapel Hill. OWASA provides service to approximately 86,300 residents through about 22,000 customer accounts. OWASA owns and maintains 3 raw water reservoirs, over 14 miles of raw water lines, the Jones Ferry Road Water Treatment Plant (WTP), 385 miles of drinking water lines, 6 drinking water storage tanks, 4 water booster pumping stations, 336 miles of wastewater collection lines (14 miles of this total are pressurized force mains), 21 wastewater pumping stations, the Mason Farm Wastewater Treatment Plant (WWTP), 5 miles of reclaimed water (RCW) lines, 2,400 fire hydrants, over 13,400 valves, and over 11,000 manholes.

OWASA's current service area population has grown steadily from approximately 15,000 in 1960 to approximately 86,300 today. Utility service needs have increased accordingly and will continue to grow in the future.

Meeting the community's needs requires ongoing rehabilitation and periodic expansion of the water, wastewater, and reclaimed water systems. Carrying out these long-range improvements while maintaining the high level of service expected by OWASA's customers requires a substantial and sustained financial commitment. In addition to the funding requirements for the capital projects outlined in this document, adequate support is needed for annual operating expenses, such as treatment plant chemicals, maintenance, electricity and natural gas, general supplies, and personnel costs. Federal and state standards for drinking water, wastewater, and reclaimed water will likely continue to become even more stringent in the future, resulting in additional capital and operating costs.

Large amounts of energy are required to pump, treat, and deliver drinking water and reclaimed water to OWASA's customers, as well as to collect and treat the community's wastewater. OWASA recognizes the important link between water and energy and is committed to reducing energy use and greenhouse gas emissions associated with its operations. Critical to that effort is prioritizing energy efficiency and sustainability in the CIP. Installation of more efficient pumps and motors, heating and air conditioning systems, and controls are planned for several areas of our operations and incorporated into several capital projects. To the extent practical, capital projects are designed to reduce future energy requirements and costs as well as OWASA's carbon footprint. In 2021, OWASA updated its [Energy Management Plan](#) which outlines the use of energy in OWASA facilities and a plan for meeting specific objectives for using energy more efficiently, using renewable energy sources, and reducing our greenhouse gas (GHG) emissions. By reducing overall energy use and increasing the use of renewable energy sources, the plan will help reduce

the demand for water resources, improve environmental impact of OWASA's operations, reduce costs, and improve reliability.

### **Purpose of Capital Improvements Planning and Budgeting**

Capital outlays differ from annual operating expenses. They are typically large and irregular in frequency and involve the construction of assets that last for decades. The effects of major capital decisions tend to be longer lasting than annual operating and maintenance decisions and require somewhat different planning and budgeting methods.

OWASA has prepared this CIP in response to those needs. This document includes water, wastewater, and reclaimed water projects anticipated to be needed during the next five years.

The CIP incorporates information and analyses from our [Asset Management Program](#) and other planning efforts. Projects are developed using the Asset Management Program's Rehabilitation and Replacement Forecast Model, hydraulic models and risk prioritization models for both the collection system and distribution system, the [Long Range Water Supply Plan](#), the WWTP hydraulic and treatment capacity study, the WTP and WWTP Reliability and Risk Assessment Evaluation and numerous other planning tools. These projects are then prioritized using a CIP Prioritization Model.

The Capital Improvements Budget (CIB) is the financing component for the program and is a major factor in OWASA's financial management decisions. To a significant extent, the CIB drives OWASA's periodic adjustment of rates and fees and affects the timing and extent of revenue bond initiatives, which enable OWASA to borrow money. Before issuing revenue bonds, OWASA must complete a financial feasibility evaluation, including a five-year projection of revenues, operating and maintenance expenses, debt service payments, and capital expenditures. The CIB is an important element of that analysis.

The preparation and annual update of the CIP/CIB accomplishes several important objectives:

1. It helps plan for the orderly repair and replacement of existing facilities; provides the ability to deal with a broad range of needs as a whole; and develops a balanced long-range program for meeting OWASA's objectives;
2. It helps provide adequate lead time for project coordination and planning, regulatory permitting, project design, land acquisition, construction, etc. in order to ensure that the necessary facilities are in place when they are needed;
3. It provides a framework for analyzing a wider range of acceptable (and less costly) alternatives than might otherwise be considered under a narrower and more time-limited evaluation.;
4. It provides a long-term perspective for assessing the adequacy of rates and fees and the timing and amount of debt-financing (revenue bond issues, State Revolving Fund loans, etc.);
5. It provides a framework for identifying, ranking, and executing projects for which the needs are most urgent, thereby minimizing customer inconvenience, project delays, and unnecessary carrying costs, and enabling the targeting of limited funds to the highest priority projects.

### **Framework**

The CIP book is organized into sections that provide descriptive information on OWASA's proposed capital improvements for FY 2024 through 2028. Projects have been grouped along functional lines into the following 11 major categories (numbered 270 through 280; please note that some categories are covered

by two numbers, e.g.. 275/375) which generally correspond to the overall movement of water through the OWASA system:

270	<b>Raw Water Supply Sources</b>
271	<b>Raw Water Transmission</b>
272	<b>Water Treatment Facilities</b>
273	<b>Drinking Water Pumping</b>
274	<b>Drinking Water Storage</b>
275/375	<b>Drinking Water Transmission and Distribution</b>
276/376	<b>Wastewater Collection Lines</b>
277	<b>Wastewater Pump Stations and Force Mains</b>
278/378	<b>Wastewater Treatment and Recycling</b>
279	<b>Reclaimed Water</b>
280	<b>Central Office and Operations</b>

Information within each project category generally is provided as follows: a general description of existing facilities; the need for additional or modified facilities; a summary table showing estimated costs of the suggested improvements; and specific information for each proposed project.

### **Assumptions**

Major facility needs are based on [demand forecasts](#) developed for OWASA's update of its Long-Range Water Supply Plan. The basic assumptions that underlie these demand forecasts through 2070 include the following:

1. OWASA's service area, which is defined in the Water and Sewer Management, Planning and Boundary Agreement, will remain unchanged. (Note: the local governments and Chamber of Commerce are considering the potential to expand the southern boundary. Given OWASA's current raw water supply and treatment plant capacities, this expansion can be accommodated, but could result in an earlier need to expand these facilities).
2. Future demand projections will continue to be based on retail water sales within the Carrboro-Chapel Hill Urban Services Area, as delineated by the Towns of Carrboro and Chapel Hill. Future demands do not anticipate any retail or wholesale delivery outside of this service area.
3. Future demand projections are based on the growth projections developed for the regional Metropolitan Transportation Plan using the CommunityViz model. As part of this process, the



Triangle J Council of Governments used the CommunityViz tool to estimate where population and employment growth would occur. Those growth projections included data for 2045 and for build-out conditions, which staff assumed would occur in 2070.

4. The regulatory environment for water and wastewater treatment will remain substantially as it is today, with the notable exception being the currently proposed drinking water regulations for per- and poly-fluoroalkyl substances (PFAS); the CIP has been developed to account for the proposed PFAS regulations. Regulations will allow us to continue with our reclaimed water program and our water treatment plant process water recycling system.

Capital cost projections assume the continuation of existing OWASA policies; e.g., that OWASA funds will not be used for water/wastewater/reclaimed water extensions into new developments.

Future cost projections are escalated at an annual rate of 4% (the average over the last 20 years' worth of inflation).

Many long-range project needs and cost estimates are based on preliminary analyses that will be further refined in subsequent CIP/CIBs as projects enter the design/construction phase and the scope and cost estimates are refined.

### **Projected Expenditures**

Summary Table 1 presents an overview of the entire five-year planning period and lists the total estimated costs of the capital projects proposed in each of the 11 major categories. Total projected expenditures are approximately \$154 million for the five-year period.

### **Financing**

Guidance for funding the improvements outlined in this document is provided in OWASA's [Financial Management Policy](#). OWASA's capital improvement costs are funded mostly through revenue received from customers. Where possible, OWASA pursues grant funding and/or low- or no-interest loans through state and federal revolving loan and grant programs.

### **Summary**

The development, review, and continuous refinement of the CIP/CIB, as part of the overall planning and budgeting process, contributes significantly to OWASA's ability to take the proactive measures necessary to meet the needs and expectations of its customers today and in the future. Allocating the appropriate amount of investment in our infrastructure to ensure reliability and resiliency without over-burdening the community with costs will remain an ongoing challenge which will require diligent management and planning.

**Orange Water and Sewer Authority**  
**Capital Improvements Program 2024-2028**  
**Summary Table 1**

<u>By Category:</u>		FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Five-Year Total
270	Raw Water Supply Sources	\$ 1,805,000	\$ 1,842,000	\$ 3,533,000	\$ 1,492,000	\$ 14,692,000	<b>\$23,364,000</b>
271	Raw Water Transmission	\$0	\$0	\$0	\$0	\$125,000	<b>\$125,000</b>
272	Water Treatment Facilities	\$4,300,000	\$12,020,000	\$13,855,000	\$20,714,000	\$16,736,000	<b>\$67,625,000</b>
273	Drinking Water Pumping	\$75,000	\$0	\$0	\$0	\$68,000	<b>\$143,000</b>
274	Drinking Water Storage	\$0	\$0	\$0	\$0	\$312,000	<b>\$312,000</b>
275 / 375	Drinking Water Transmission and Distribution	\$ 3,004,000	\$ 1,460,000	\$ 7,236,000	\$ 3,197,000	\$ 1,935,000	<b>\$16,832,000</b>
276 / 376	Wastewater Collection	\$ 2,765,000	\$ 6,535,000	\$ 7,395,000	\$ 3,870,000	\$ 2,870,000	<b>\$23,435,000</b>
277	Wastewater Pump Stations and Force Mains	\$ 645,000	\$ 440,000	\$ 710,000	\$ 600,000	\$ 850,000	<b>\$3,245,000</b>
278/ 378	Wastewater Treatment and Recycling	\$ 2,455,000	\$ 4,505,000	\$ 2,672,000	\$ 3,510,000	\$ 340,000	<b>\$13,482,000</b>
279	Reclaimed Water	\$75,000	\$0	\$0	\$80,000	\$80,000	<b>\$235,000</b>
280	Central Office and Operations	\$1,000,000	\$1,500,000	\$500,000	\$1,000,000	\$1,000,000	<b>\$5,000,000</b>
<b>TOTALS</b>		<b>\$16,124,000</b>	<b>\$28,302,000</b>	<b>\$35,901,000</b>	<b>\$34,463,000</b>	<b>\$39,008,000</b>	<b>\$153,798,000</b>

<u>By Funding Source:</u>		FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Five-Year Total
<b>Cash</b>		\$9,764,000	\$14,865,000	\$23,762,000	\$28,610,000	\$22,905,000	<b>\$99,906,000</b>
<b>Potential Bonds/Loans</b>		\$6,360,000	\$13,437,000	\$12,139,000	\$5,853,000	\$16,103,000	<b>\$53,892,000</b>
<b>Grants</b>		\$0	\$0	\$0	\$0	\$0	<b>\$0</b>
<b>TOTALS</b>		<b>\$16,124,000</b>	<b>\$28,302,000</b>	<b>\$35,901,000</b>	<b>\$34,463,000</b>	<b>\$39,008,000</b>	<b>\$153,798,000</b>

## Category 270: Raw Water Supply Sources

### **Background**

Ninety percent of OWASA's water supply originates as rainfall and surface runoff from within Orange County. The remaining ten percent comes from nearby portions of our watersheds in Alamance and Chatham Counties. Because natural streamflow is not sufficient to meet customer demands at all times, OWASA relies on three storage reservoirs to capture and store excess water during periods of higher flow.



### **Existing Facilities**

OWASA's existing raw water supplies are University Lake, Cane Creek Reservoir, and the Quarry Reservoir. OWASA also holds a storage allocation at the B. Everett Jordan Reservoir (Jordan Lake) in Chatham County. OWASA's oldest supply source is University Lake, which was impounded on Morgan Creek in 1932. It is located near Jones Ferry Road adjacent to the western corporate limits of Carrboro. This 212-acre reservoir drains a 30-square mile watershed and has a usable storage capacity of about 450 million gallons (MG). The lake and about 500 acres of adjacent lands are owned by the University of North Carolina (UNC). OWASA is entitled to use University Lake as a water supply source and controls all land within 100 feet of the shoreline through a contractual agreement with UNC.

The 540-acre Cane Creek Reservoir, completed in 1989, is located near N.C. Highway 54 about 11 miles west of Carrboro and can store approximately 3 billion gallons (BG) of water derived from its 32-square mile drainage area. More than 2,000 acres of surrounding watershed land is either owned by OWASA or protected through conservation easements.

OWASA's third existing water supply source is the Quarry Reservoir, located on N.C. 54 about 5 miles west of Carrboro in the University Lake watershed. It was acquired in 1979 to supplement raw water supplies during severe droughts or other emergencies. It can be filled with excess water from the Cane Creek Reservoir and currently has a usable storage volume of about 200 MG. OWASA purchased additional land around the quarry in 2000, which it leases to American Stone Company. Approvals were obtained in 2001 to expand the American Stone Company's quarrying operations in the direction of OWASA's Quarry Reservoir. Mining operations will cease by 2030 and the large remaining quarry pit will be available for use as raw water storage, providing a total storage volume of about 2 BG. Improvements completed in 2007 increased the pumping capacity from the Quarry Reservoir and provide additional operational flexibility for the overall water supply system. Current work is underway to plan for the expansion of the storage volume into the additional land currently leased by the American Stone Company.

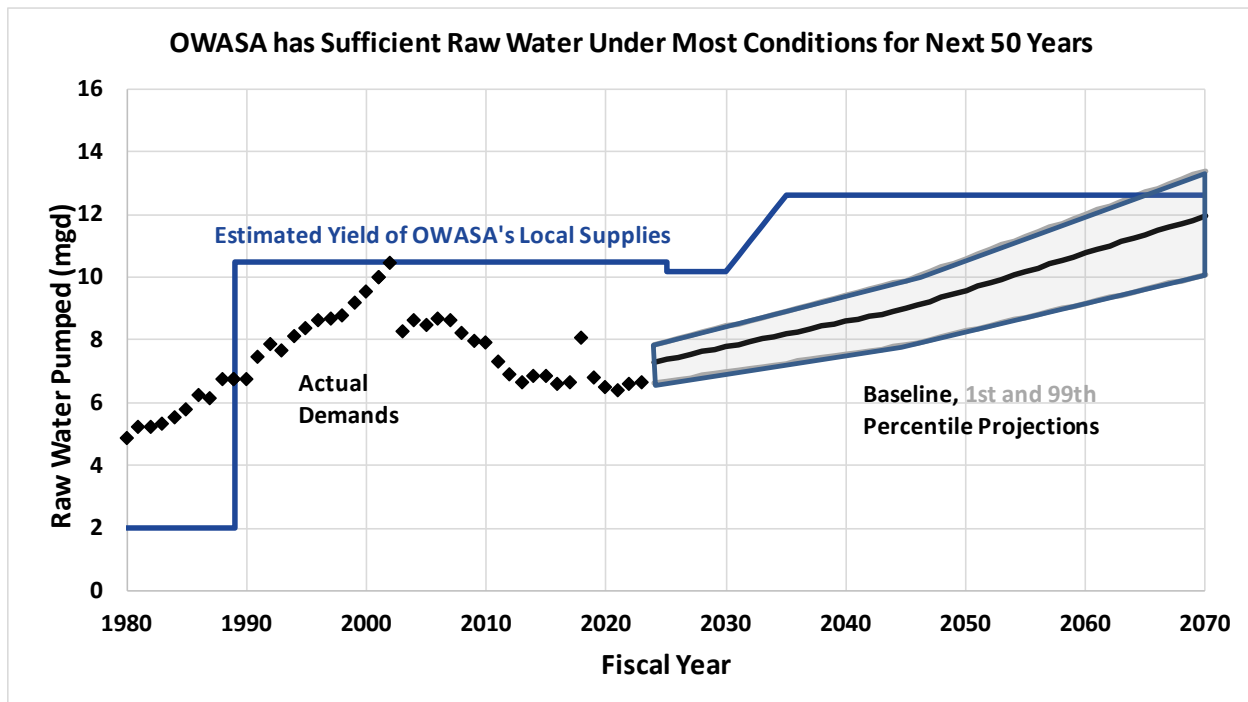
Cane Creek Reservoir, University Lake, and the existing Quarry Reservoir receive sufficient streamflow and have enough storage and transmission capacity to support an average yield of approximately 10.5 million gallons per day (MGD) while still retaining an emergency storage reserve of 700 MG (~20% of capacity) under the worst drought of record conditions for OWASA (2001-2002). Expansion of the Quarry Reservoir will eventually provide a total system yield of approximately 12.6 MGD based on a contractual

rock extraction agreement with American Stone. When OWASA has access to its Jordan Lake allocation, our estimated yield will be higher.

Existing interconnections provide the capacity to receive approximately 7 MGD of treated drinking water from the City of Durham and 3 MGD from the Town of Hillsborough, but due to capacity constraints at Hillsborough's WTP, the transfer ability may be limited to 1 or 1.5 MGD. OWASA also has an interconnection with Chatham County. OWASA can receive approximately 1 MGD through this connection. The combined capacity of our interconnections is about 9.5 MGD, which is about 142 percent of our Fiscal Year 2023 average-day drinking water demands.

OWASA updated its [Long-Range Water Supply Plan](#) (LRWSP) to ensure we have water to meet our needs through 2070. Key findings of that Plan included the following: (1) OWASA's locally protected water supplies (with the expanded Quarry Reservoir) can meet most expected needs through 2070, but we are vulnerable during droughts and will need supplemental supplies later in the planning period; (2) we are moving forward with expanding the Quarry Reservoir; (3) accessing our Jordan Lake allocation by partnering with the City of Durham, Town of Pittsboro, and Chatham County on a new intake and transmission infrastructure on the west side of Jordan Lake is the best method to address our drought vulnerability and to meet our long-term water supply needs.

As part of this update of the LRWSP, the OWASA Board of Directors authorized the use of raw water demand projections, which include a range to capture uncertainty in demand projects, as the basis to evaluate water supply and demand management options to meet the community's water needs in March 2019. Projections of future demand developed as part of the LRWSP comprise a range of population growth, density, development, and water consumption scenarios that may occur through 2070. The figure below shows the updated raw water demand projections developed as part of that project.



The diamond-shaped data points in the figure above represent actual raw water demand since 1980. Because of the significant uncertainty in projecting growth and water demands out 50 years, a range of projections was developed (grey lines). Further information on the methodology is included in this [report](#). The dark blue line indicates the operational yield of OWASA's existing reservoir/quarry system (Cane Creek Reservoir, University Lake and Quarry Reservoir), including the additional yield that will result from a 1.3 BG expansion of Quarry Reservoir storage. This amount is based on the least volume that would be available after 2030 per American Stone Company's minimum production commitment and would be accessible with OWASA's existing pumping facilities; i.e., with little need for major capital improvements, but there will be permitting required to bring the facility online. Yield calculations assume that 20% of usable reservoir storage is held in reserve for extreme (emergency) drought conditions.

OWASA currently holds an allocation of 5% of Jordan Lake's water supply storage capacity, which can provide a yield of about 5 MGD. OWASA's allocation was converted from Level II (long-term future use) to Level I (nearer term use in the event of severe drought or water supply emergency) in March 2013. Although OWASA's goal is to maximize use of the Cane Creek Reservoir/University Lake/expanded Quarry Reservoir system, Jordan Lake represents an important supplemental source for meeting water demands under certain conditions of supply and demand.

OWASA and our utility neighbors must address the resiliency of water supply and storage, especially for periods of severe and extended droughts as well as the capacity of our reclaimed water system, which may face higher peak demands as temperatures increase with climate change. OWASA worked with our utility neighbors through the Jordan Lake Partnership (JLP) to develop the Triangle Regional Water Supply Plan to ensure all Partners have sufficient and reliable water supply through 2070. The JLP also contracted a regional interconnection study to evaluate the interconnection capacity of our drinking water systems and to identify needed infrastructure improvements to meet future needs. In 2018, the JLP was replaced with the Triangle Water Supply Partnership (TWP). The TWP is building on the work of the JLP and recently updated the interconnection model and used it to run planning scenarios to identify strategies to improve the region's resiliency to planned and unplanned water supply challenges such as water treatment plant

outages. The TWP recently began work to update the Triangle Regional Water Supply Plan.

OWASA is also working with the City of Durham, Town of Pittsboro, and Chatham County (Western Intake Partners) to plan, design, and permit new water supply intake, treatment, and transmission facilities on the western side of Jordan Lake. OWASA does not yet need access to its Jordan Lake allocation on a regular basis so is participating in a limited capacity to have ownership in parts of the infrastructure that are difficult or costly to expand later, such as the intake and transmission infrastructure. OWASA will postpone ownership in the proposed water treatment facility until a later phase.

### **Planned Improvements**

The CIP includes \$23.4 million to fund several projects to improve and ensure the long-term viability of the raw water supply system. At University Lake, construction to build a chemical facility to address taste and odor concerns ([270-28](#)) is wrapping up and additional work to improve the dam will be started ([270-35](#)). At Cane Creek Reservoir, the CIP provides funds for improvements at the pump station ([270-16](#)) and dam ([270-30](#)) and the dam diversion tunnel ([270-36](#)). The CIP also includes OWASA's participation in the Western Intake Partnership Projects ([270-34](#)).

Planned improvements are listed in the table on the following page.

<b>Category 270: Raw Water Supply Sources</b>							
		<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>FY 2028</b>	<b>Five-Year Total</b>
270-04	Jordan Lake Raw Water Supply Allocation	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	<b>\$50,000</b>
270-09	Quarry Reservoir Development	\$95,000	\$15,000	\$15,000	\$15,000	\$15,000	<b>\$155,000</b>
270-16	Cane Creek Pump Station Improvements	\$25,000	\$250,000	\$2,041,000	\$0	\$0	<b>\$2,316,000</b>
270-28	University Lake Permanganate Facility	\$1,000,000	\$0	\$0	\$0	\$0	<b>\$1,000,000</b>
270-30	Cane Creek Dam Rehabilitation	\$50,000	\$0	\$0	\$0	\$0	<b>\$50,000</b>
270-34	Western Intake Partnership Projects	\$500,000	\$1,467,000	\$1,467,000	\$1,467,000	\$14,667,000	<b>\$19,568,000</b>
270-35	University Lake Dam Improvements Project	\$75,000	\$0	\$0	\$0	\$0	<b>\$75,000</b>
270-36	Cane Creek Dam Diversion Tunnel Improvements	\$50,000	\$100,000	\$0	\$0	\$0	<b>\$150,000</b>
<b>270</b>	<b>Category Total</b>	<b>\$1,805,000</b>	<b>\$1,842,000</b>	<b>\$3,533,000</b>	<b>\$1,492,000</b>	<b>\$14,692,000</b>	<b>\$23,364,000</b>

## 270-04 Jordan Lake Raw Water Supply Allocation

### Description/Background:

OWASA currently holds an allocation of 5% of Jordan Lake's water supply storage capacity, which can provide a yield of about 5 MGD. OWASA's allocation was converted from Level II (long-term future use) to Level I (nearer term use in the event of severe drought or water supply emergency) in March 2013. Funding is provided for the annual operation and maintenance (O&M) costs associated with this allocation of water supply storage in Jordan Lake. Although OWASA's goal is to maximize use of the Cane Creek Reservoir/University Lake/expanded Quarry Reservoir system, Jordan Lake represents an important supplemental source for meeting water demands under certain conditions of supply and demand.

**Benefits:** increases reliability and reduces operational risk due to water shortages

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$50,000
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$10,000</b>	<b>\$10,000</b>	<b>\$10,000</b>	<b>\$10,000</b>	<b>\$10,000</b>	<b>\$50,000</b>

**Current Status:** Planning

## 270-09 Quarry Reservoir Development

### Description/Background:

In 2000, OWASA acquired the property north of N.C. Highway 54 and west of (Old) Bethel-Hickory Grove Church Road on which the American Stone Company's active quarry operations are currently located. The final land acquisition payment was made in FY 2006. Ongoing annual payments of \$15,000 are made to Orange County's "No-fault Well Repair Fund" in compliance with the Special Use Permit conditions under which OWASA will expand the Quarry Reservoir. The payments will end in FY 2030, which is when quarrying operations will cease. Additional funding is included in FY 2024 to conduct a planning study for the Quarry Reservoir expansion to better understand future permitting and construction needs.

**Benefits:** required by permit for future quarry expansion

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$95,000	\$15,000	\$15,000	\$15,000	\$15,000	\$155,000
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$95,000</b>	<b>\$15,000</b>	<b>\$15,000</b>	<b>\$15,000</b>	<b>\$15,000</b>	<b>\$155,000</b>

**Current Status:** Planning



## 270-16 Cane Creek Pump Station Improvements

### Description/Background:

Funds are included in FY 2024 through FY 2026 for adding automatic generator transfer switchgear, building a permanent enclosure for the generator, and installing variable frequency drives (VFD). SCADA improvements at this location may also be included. Planning and design are funded for FY 2024 and FY 2025, and the majority of construction is expected to occur in FY 2026. This work was identified by OWASA maintenance staff.

**Benefits:** replaces aging assets; reduces operational risk through safer and faster transfer to backup power; may reduce energy use

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$20,000	\$0	\$0	\$0	\$0	\$20,000
<b>Design/Land</b>	\$0	\$225,000	\$0	\$0	\$0	\$225,000
<b>Construction</b>	\$0	\$0	\$1,650,000	\$0	\$0	\$1,650,000
<b>Inspection</b>	\$0	\$0	\$93,000	\$0	\$0	\$93,000
<b>Construction Admin</b>	\$0	\$0	\$93,000	\$0	\$0	\$93,000
<b>Contingency</b>	\$5,000	\$25,000	\$205,000	\$0	\$0	\$235,000
<b>TOTAL</b>	<b>\$25,000</b>	<b>\$250,000</b>	<b>\$2,041,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$2,316,000</b>

**Current Status:** Not yet started, designer selection to be initiated in FY 2024

## 270-28 University Lake Permanganate Facility

### Description/Background:

A FY 2013 study of the existing dry potassium permanganate feed system recommended relocation of the permanent feed system from the WTP to the two raw water reservoirs, Cane Creek Reservoir and University Lake, in order to increase contact times. Furthermore, the study concluded that liquid sodium permanganate feed systems would be more economical and safer than equivalent dry potassium permanganate feed systems. The Cane Creek Reservoir permanganate facility was completed in FY 2018.

Design and permitting of a new permanganate facility at University Lake began in FY 2019, was complete in FY 2021, construction started in FY 2023 and is expected to be complete in FY 2024. The new facility will include a chemical storage tank and containment area, a chemical storage and feed building, metering pumps, auxiliary building systems, and associated site, electrical, and piping improvements.

This project has been approved for a low interest loan under the Drinking Water State Revolving Fund program.

**Benefits:** reduces safety risk; increases reliability and reduces operational risk; increases performance

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
Planning	\$0	\$0	\$0	\$0	\$0	\$0
Design/Land	\$0	\$0	\$0	\$0	\$0	\$0
Construction	\$730,000	\$0	\$0	\$0	\$0	\$730,000
Inspection	\$100,000	\$0	\$0	\$0	\$0	\$100,000
Construction Admin	\$100,000	\$0	\$0	\$0	\$0	\$100,000
Contingency	\$70,000	\$0	\$0	\$0	\$0	\$70,000
TOTAL	\$1,000,000	\$0	\$0	\$0	\$0	\$1,000,000

**Current Status:** Under Construction

## 270-30 Cane Creek Dam Rehabilitation

### Description/Background:

This project provides funds for replacement of joint sealant on the concrete spillway at the Cane Creek Dam as identified by a recent engineering inspection of the dam and adjacent facilities. Work began in FY 2023 and is expected to be complete in FY 2024.

**Benefits:** reduces operational risk, replaces aging assets

### Funding:

	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	5-Year Total
Planning	\$0	\$0	\$0	\$0	\$0	\$0
Design/Land	\$5,000	\$0	\$0	\$0	\$0	\$0
Construction	\$30,000	\$0	\$0	\$0	\$0	\$30,000
Inspection	\$5,000	\$0	\$0	\$0	\$0	\$5,000
Construction Admin	\$5,000	\$0	\$0	\$0	\$0	\$5,000
Contingency	\$5,000	\$0	\$0	\$0	\$0	\$10,000
TOTAL	\$50,000	\$0	\$0	\$0	\$0	\$50,000

**Current Status:** Underway, design and construction to be complete in FY 2024.

## 270-34 Western Intake Partnership Projects

### Description/Background:

This project provides funds for OWASA's participation in the Western Intake Partnership. The allocated funds are for investment in the projects related to the planning, permitting and design of the intake and transmission infrastructure on the western side of Jordan Lake as supported in the Long-Range Water Supply Plan. FY 2028 funds also include construction monies which are contingent upon Board approval of the interlocal agreement with the other entities of the Western Intake Partnership.

**Benefits:** reduces operational risk

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$460,000	\$580,000	\$580,000	\$580,000	\$0	\$2,200,000
<b>Design/Land</b>	\$0	\$837,000	\$837,000	\$837,000	\$667,000	\$3,178,000
<b>Construction</b>	\$0	\$0	\$0	\$0	\$8,000,000	\$8,000,000
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$2,000,000	\$2,000,000
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$2,000,000	\$2,000,000
<b>Contingency</b>	\$40,000	\$50,000	\$50,000	\$50,000	\$2,000,000	\$2,190,000
<b>TOTAL</b>	<b>\$500,000</b>	<b>\$1,467,000</b>	<b>\$1,467,000</b>	<b>\$1,467,000</b>	<b>\$14,667,000</b>	<b>\$19,568,000</b>

**Current Status:** Planning, permitting and design is underway through the Western Intake Partnership Program

## 270-35 University Lake Dam Improvements Project

### Description/Background:

This project provides funds for rehabilitating concrete at the University Lake Dam in FY 2024. The 2021 University Lake Dam annual inspection identified the need to address spalling and deteriorated joints in the non-overflow sections of concrete and along the adjoining concrete walls.

**Benefits:** reduces operational risk, rehabilitates aging infrastructure

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
Planning	\$0	\$0	\$0	\$0	\$0	\$0
Design/Land	\$15,000	\$0	\$0	\$0	\$0	\$15,000
Construction	\$50,000	\$0	\$0	\$0	\$0	\$50,000
Inspection	\$2,500	\$0	\$0	\$0	\$0	\$2,500
Construction Admin	\$2,500	\$0	\$0	\$0	\$0	\$2,500
Contingency	\$5,000	\$0	\$0	\$0	\$0	\$5,000
<b>TOTAL</b>	<b>\$75,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$75,000</b>

**Current Status:** Design is under contract.

## 270-36 Cane Creek Dam Diversion Tunnel Improvements Project

### Description/Background:

This project provides funding for dredging the Diversion Tunnel at the Cane Creek Dam. Accumulated sediment at the tunnel has raised safety and access concerns. In addition to addressing these concerns, this work is anticipated to restore the ability to properly monitor seepage discharges. It is anticipated that permitting and design work will begin in FY 2024 with construction activities occurring in FY 2025. This work was identified in the 2021 Cane Creek Dam inspection report.

**Benefits:** reduces safety risk; reduces operational risk

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$45,000	\$0	\$0	\$0	\$0	\$45,000
<b>Construction</b>	\$0	\$85,000	\$0	\$0	\$0	\$85,000
<b>Inspection</b>	\$0	\$5,000	\$0	\$0	\$0	\$5,000
<b>Construction Admin</b>	\$0	\$5,000	\$0	\$0	\$0	\$5,000
<b>Contingency</b>	\$5,000	\$5,000	\$0	\$0	\$0	\$10,000
<b>TOTAL</b>	<b>\$50,000</b>	<b>\$100,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$150,000</b>

**Current Status:** Design is under contract

## Category 271: Raw Water Transmission

### Background

Water from OWASA's raw water supply storage reservoirs is pumped through transmission mains to the Water Treatment Plant (WTP). These mains, in combination, are sized to carry the maximum daily flow demands in the service area. Where economically feasible, transmission mains are also sized to maximize the available yield from the system and to provide redundant capacity.

### Existing Facilities

Raw water is pumped from University Lake to the WTP in Carrboro by three electrically-driven pumps, each with variable frequency drives, and one diesel engine-driven pump, with a combined maximum effective operating capacity of 20 million gallons per day (MGD). Water is conveyed through two separate transmission mains: a 6,000 foot, 20-inch concrete main constructed in 1963 and a 7,000 foot, 42-inch ductile iron pipe (DIP) main built in 2003.

Water is pumped from the Cane Creek Reservoir by two 2-speed pumps, each originally capable of delivering 12 MGD at high speed, and 6 or 8 MGD at low speed. The pumps are not configured to operate simultaneously. Water is pumped through 33,300 feet of 24-inch DIP located along N.C. 54, where it can be diverted to either the Quarry Reservoir or University Lake via Phil's Creek. An additional 24,500 feet of 30-inch raw water transmission piping, completed in 1991, allows delivery of Cane Creek Reservoir water directly to the WTP. The actual transmission capacity of the Cane Creek raw water line is 10.7 MGD.

The current Quarry Reservoir configuration provides 200 million gallons of additional storage capacity. The pump station, completed in 2007, has a capacity of 4 to 6 MGD, depending on the water level in the quarry. The quarry water is delivered to the WTP through a connection to the Cane Creek raw water transmission main.

### Planned Improvements

The CIP includes funding for condition assessments of raw water transmission mains from Cane Creek Reservoir ([271-05](#)).

## Category 271: Raw Water Transmission

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Five-Year Total
271-05 Cane Creek Raw Water Transmission Main Study	\$0	\$0	\$0	\$0	\$125,000	<b>\$125,000</b>
<b>271 Category Total</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$125,000</b>	<b>\$125,000</b>

## 271-05 Cane Creek Raw Water Transmission Main Study

### Description/Background:

Funding is provided in FY 2028 to test the friction coefficient in the existing 24-inch diameter raw water main from the Cane Creek Reservoir to the Quarry Reservoir in order to determine if the main needs to be cleaned to restore its carrying capacity.

**Benefits:** determines asset risk; may reduce energy use

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
Planning	\$0	\$0	\$0	\$0	\$115,000	\$115,000
Design/Land	\$0	\$0	\$0	\$0	\$0	\$0
Construction	\$0	\$0	\$0	\$0	\$0	\$0
Inspection	\$0	\$0	\$0	\$0	\$0	\$0
Construction Admin	\$0	\$0	\$0	\$0	\$0	\$0
Contingency	\$0	\$0	\$0	\$0	\$10,000	\$10,000
TOTAL	\$0	\$0	\$0	\$0	\$0	\$125,000

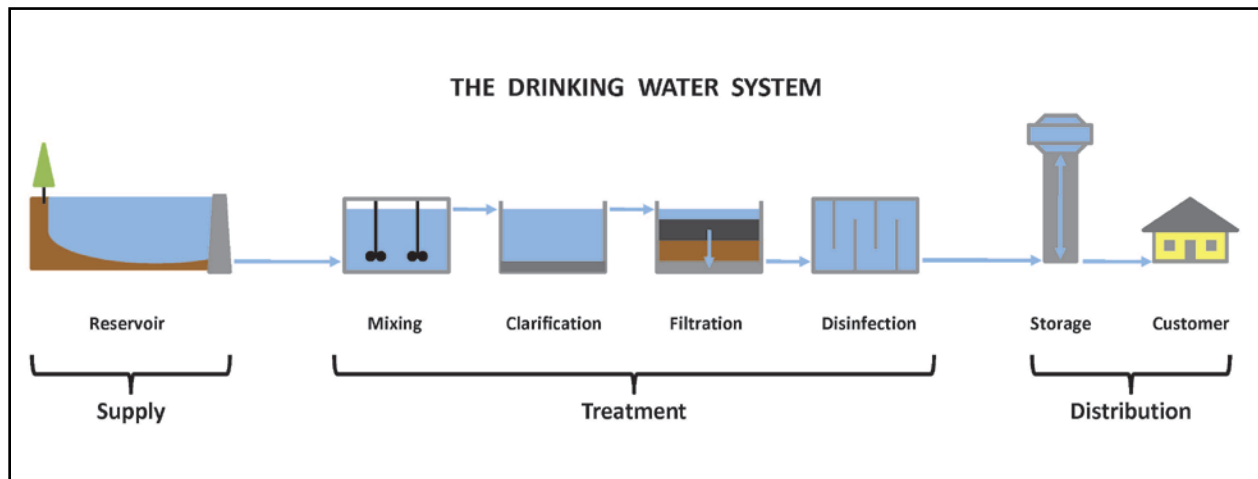
**Current Status:** Not yet started



## Category 272: Water Treatment Facilities

### Background

Raw water withdrawn from OWASA's water supply reservoirs is treated by chemical and physical processes at the Water Treatment Plant (WTP). Unlike our reservoirs, which are sized to meet average daily demand calculated over a year, the WTP must be able to meet the maximum or peak demand on any given day.



### Existing Facilities

Water from University Lake, Cane Creek Reservoir, and the Quarry Reservoir is treated at the WTP, which is located on a 17-acre site on Jones Ferry Road in Carrboro. The WTP is configured with a chemical flash mixer followed by two parallel (independent) treatment trains:

1. Conventional coagulation/flocculation chamber followed by five gravity settling basins which can be operated at variable rates with a combined capacity of 10 million gallons per day (MGD);
2. Two upflow clarifiers with a combined capacity of an additional 10 MGD

The two clarification processes are operated together to meet system demands. Clarified water is further treated through ten dual-media filters with a total surface area of 3,880 square feet. When operated at the permitted filtration rate of 4.0 gallons per square foot per minute the filters have a combined capacity of 22.3 MGD.

Chemicals used in the treatment process include ferric sulfate for coagulation, liquid caustic (sodium hydroxide) for pH control, sodium permanganate and powdered activated carbon for organic removal and taste and odor control, a blend of orthophosphates and polyphosphates for corrosion control, sodium hypochlorite and ammonia (ammonium sulfate) for chloramine disinfection, and hydrofluorosilicic acid for community-wide dental health. The 1.5 million-gallon clearwell (underground water reservoir) stores drinking water at the WTP before it is pumped into the distribution system.

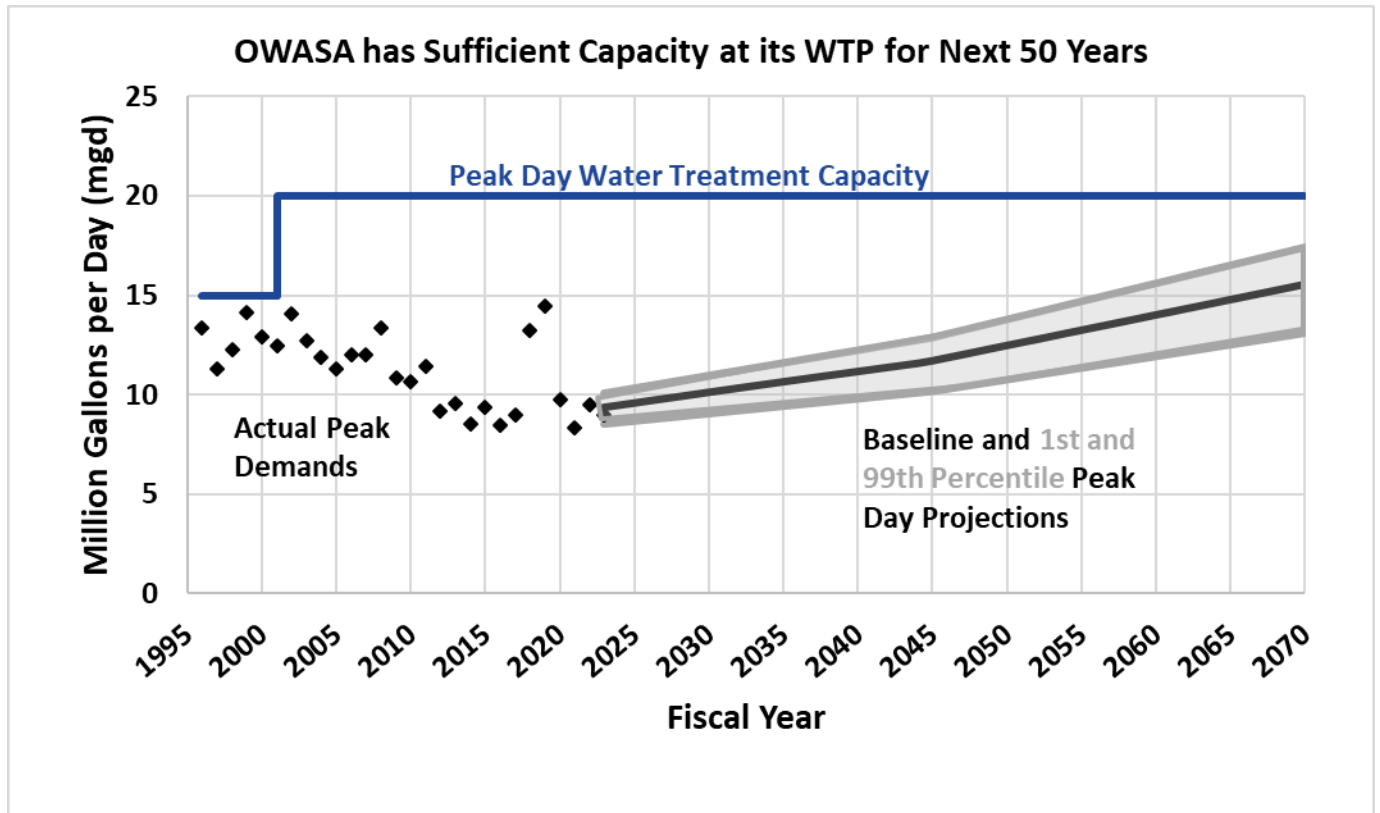
The WTP was originally built in 1948 with a capacity of 3 MGD and was expanded to 5 MGD and 10 MGD in 1963 and 1974, respectively. Upflow clarifiers added in 1990 increased the capacity to 12.5 MGD, and the addition of new filters, solids handling, and chemical feed facilities increased the capacity to 15 MGD in 1995. Curtain baffles were installed in the clearwell in 1999 to improve disinfectant contact time.

Additional solids handling facility improvements were completed in 2001 and increased the ability to support sedimentation solids and filter backwash requirements. Additional backwash storage and treatment facilities, along with the addition of a gravity thickener and a belt filter press provided the capacity to handle solids produced by a 20 MGD plant. This project was followed by a phased series of WTP improvements.

- Phase I improved the filter efficiency and provided new underdrains for the eight existing filters, as well as blowers for air scouring the filters.
- Phase II, completed in 2002, increased the drinking water pumping capacity from 15 to 18 MGD. This project also included installation of an ammonia feed system for chloramine disinfection, a process that decreases the concentration of disinfection byproducts (DBPs), provides more reliable compliance with state and federal DBP limits, and improves drinking water taste.
- Phase III was completed in 2002 and provided two new filters, which increased the total capacity of all 10 filters from 17.3 MGD to 22.3 MGD, thereby increasing the WTP overall “firm” capacity from 18 MGD to its current capacity of 20 MGD.
- Phase IV was completed in 2006 and included the installation of a permanent process water recycling system to enable the reuse of process water from the solids handling system and backwash clarifiers. This state-approved recycling system reduced raw water withdrawals from the reservoirs – and the associated use of electrical energy for raw water pumping – by 6 to 7 percent. Other Phase IV improvements included clearwell and bypass pumping modifications.

Following a fire at the WTP in August 2007, the 2,300-volt Drinking Water Pumps Nos. 1, 2, and 3 were replaced with a single 480-volt, 300 horsepower horizontal split-case pump (Pump No. 7) with a variable frequency drive (VFD). A new 1,000-kilowatt generator was installed in June 2013. Rehabilitation and upgrades were completed in 2014 to the two upflow clarifiers (pulsators) originally installed in 1990.

In FY 2023, the chemical improvements project at the WTP was completed. This project added a new chemical tank farm, provided new chemical pumps, and rehabilitated existing chemical systems. Additionally, improvements to finished water pump No. 5 and No. 6 were completed in FY 2023 with a new VFD added to pump No. 5 to increase operational flexibility and the VFD replaced on pump No. 6.



In the graph above, the peak-day drinking water demands are shown (black diamonds for historical demands, black and gray lines for future demands). Since FY 1999, the year with the highest peak day demand under normal operations, peak day drinking water demands have declined by 33 percent despite a 33 percent increase in customer accounts over that same period. The decline in peak demands from FY 1999 is around 30 percent when other recent years are included in the evaluation). Water conservation efforts by OWASA's customers, together with the University's use of reclaimed water commencing in 2009, have freed up water supply and treatment capacity to meet future needs, thereby enabling OWASA to substantially defer the need for additional water treatment capacity. (The significant increases in peak day drinking water demands in FY 2018 and FY 2019 are anomalies resulting from: in FY 2018, the provision of water to the City of Durham for an extended period of time; and in FY 2019, the large water main break in front of the WTP on November 5, 2018. Peak-day demands for those two years would be in line with historical amounts if not for those two events.)

### **Planned Improvements**

Planned improvements for this category are shown in the table on the following page and include a total of approximately \$68 million within the five-year period. Notable projects include clearwell rehabilitation ([272-55](#)), SCADA system upgrades ([272-49](#)), and the addition of PFAS treatment ([272-63](#)).

### Category 272: Water Treatment Facilities

		FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Five-Year Total
272-37	WTP Belt Filter Press Replacement	\$1,100,000	\$1,000,000	\$0	\$0	\$0	<b>\$2,100,000</b>
272-49	WTP SCADA Master Plan Recommendations	\$800,000	\$1,000,000	\$700,000	\$500,000	\$500,000	<b>\$3,500,000</b>
272-52	WTP Electrical Distribution Improvements	\$1,000,000	\$6,720,000	\$1,955,000	\$0	\$0	<b>\$9,675,000</b>
272-55	WTP Clearwell Rehab and Flash Mix Rehab	\$25,000	\$0	\$100,000	\$214,000	\$736,000	<b>\$1,075,000</b>
272-59	Finished Water Pump #4 Motor and Pump Replacement	\$325,000	\$0	\$0	\$0	\$0	<b>\$325,000</b>
272-63	PFAS Study, Design, and Treatment	\$800,000	\$3,200,000	\$11,000,000	\$20,000,000	\$15,500,000	<b>\$50,500,000</b>
272-65	Water Supply and Treatment Condition Assessments	\$100,000	\$100,000	\$100,000	\$0	\$0	<b>\$300,000</b>
<b>272</b>	<b>Category Total</b>	<b>\$4,150,000</b>	<b>\$12,020,000</b>	<b>\$13,855,000</b>	<b>\$20,714,000</b>	<b>\$16,736,000</b>	<b>\$67,475,000</b>

## 272-37 WTP Belt Filter Press Replacement

### Description/Background:

Belt filter presses (BFP) are used to dewater solids from the treatment process prior to transport to a composting facility for beneficial reuse as a soil amendment. The WTP has two BFP's: BFP No.1 is no longer operational or serviceable and needs to be replaced to ensure reliability and redundancy of this essential treatment plant process. BFP No.2 was rehabilitated in FY 2020.

A FY 2019 planning study evaluated several project options, including alternative dewatering technologies. Recommended improvements include the replacement of BFP No.1, replacement of the solids conveyor system, and installation of new control system improvements. Design and permitting were completed in FY 2022. Construction started in FY 2023 and is anticipated to be complete by FY 2025.

This project has been approved for a low interest loan under the Drinking Water State Revolving Fund program, which will result in lower borrowing costs than conventional loans.

**Benefits:** replaces or extends useful life of aging assets

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
Planning	\$0	\$0	\$0	\$0	\$0	\$0
Design/Land	\$0	\$0	\$0	\$0	\$0	\$0
Construction	\$800,000	\$700,000	\$0	\$0	\$0	\$1,500,000
Inspection	\$100,000	\$100,000	\$0	\$0	\$0	\$200,000
Construction Admin	\$100,000	\$100,000	\$0	\$0	\$0	\$200,000
Contingency	\$100,000	\$100,000	\$0	\$0	\$0	\$200,000
<b>TOTAL</b>	<b>\$1,100,000</b>	<b>\$1,000,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$2,100,000</b>

**Current Status:** Under Construction

## 272-49 WTP SCADA Master Plan Recommendations

### Description/Background:

This project will implement the recommendations for the Supervisory Control and Data Acquisition (SCADA) system at the WTP as a result of the master planning study that was completed in FY 2021.

FY 2024 through FY 2028 funds are included to design and implement the near-term recommendations of the master plan including replacing obsolete equipment, updating control philosophies and system architecture, and overall system improvements and upgrades.

**Benefits:** reduces operational risk

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$230,000	\$300,000	\$20,000	\$50,000	\$0	\$600,000
<b>Construction</b>	\$420,000	\$580,000	\$500,000	\$300,000	\$400,000	\$2,200,000
<b>Inspection</b>	\$50,000	\$80,000	\$80,000	\$60,000	\$35,000	\$305,000
<b>Construction Admin</b>	\$50,000	\$20,000	\$70,000	\$60,000	\$35,000	\$235,000
<b>Contingency</b>	\$50,000	\$20,000	\$30,000	\$30,000	\$30,000	\$160,000
<b>TOTAL</b>	<b>\$800,000</b>	<b>\$1,000,000</b>	<b>\$700,000</b>	<b>\$500,000</b>	<b>\$500,000</b>	<b>\$3,500,000</b>

**Current Status:** Design underway

## 272-52 WTP Electrical Distribution Improvements

### Description/Background:

The 2018 Risk and Reliability Study identified a high priority need to convert the remainder of plant electrical distribution system to an updated voltage standard (a majority of the system already uses the updated standard), construction of a new 650 square foot electrical building, relocation of the existing 1500 kW generator, ability to provide closed transition transfer capabilities for both generators, and miscellaneous other electrical improvements throughout the electrical distribution system at the WTP.

Design commenced in FY 2020 and was completed in FY 2022. Construction is currently funded for FY 2024 through FY 2026, although this timing will be re-evaluated to consider necessary coordination with other major projects at the WTP.

**Benefits:** reduces operational risk; reduces safety risk

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction</b>	\$700,000	\$5,870,000	\$1,600,000	\$0	\$0	\$8,170,000
<b>Inspection</b>	\$100,000	\$150,000	\$125,000	\$0	\$0	\$375,000
<b>Construction Admin</b>	\$100,000	\$150,000	\$125,000	\$0	\$0	\$375,000
<b>Contingency</b>	\$100,000	\$550,000	\$105,000	\$0	\$0	\$755,000
<b>TOTAL</b>	<b>\$1,000,000</b>	<b>\$6,720,000</b>	<b>\$1,955,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$9,675,000</b>

**Current Status:** Fully designed

## 272-55 Clearwell Rehabilitation and Flash Mix Rehabilitation

### Description/Background:

An inspection completed in FY 2020 determined that areas of spalling and cracking within the concrete roof or the clearwell required repair. An additional investigation completed in FY 2023 identified that the rate of concrete degradation had increased, and a more significant repair is needed. Furthermore, design and subsequent construction to repair an identified active clearwell leak was completed in FY 2023. Current work is underway to design the clearwell rehabilitation needed to stabilize the clearwell.

The WTP's two flash mix basins, one for each of the two treatment trains, are where coagulation chemicals are added to the raw water entering the WTP. The basins are designed with the ability to be isolated from each other in order to allow for different chemical dosages, if needed, for each treatment train. A study completed in FY 2023 identified minor improvements needed at the flash mix that will be included in the Operating budget.

**Benefits:** extends service life of aging assets, improves operational efficiency

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$20,000	\$0	\$80,000	\$76,000	\$0	\$176,000
<b>Construction</b>	\$0	\$0	\$0	\$68,000	\$546,000	\$614,000
<b>Inspection</b>	\$0	\$0	\$0	\$30,000	\$75,000	\$105,000
<b>Construction Admin</b>	\$0	\$0	\$0	\$30,000	\$75,000	\$105,000
<b>Contingency</b>	\$5,000	\$0	\$20,000	\$10,000	\$40,000	\$75,000
<b>TOTAL</b>	<b>\$25,000</b>	<b>\$0</b>	<b>\$100,000</b>	<b>\$214,000</b>	<b>\$736,000</b>	<b>\$1,075,000</b>

**Current Status:** In design



## 272-59 Finished Water Pump No. 4 Motor and Pump Replacement

### Description/Background:

The WTP uses four pumps (Finished Water Pumps Nos. 4 through 7) to send drinking water from the plant into the distribution system. Finished water pumping is the largest consumer of electrical energy at the WTP. Recent projects were completed to add or replace variable frequency drives (VFDs) on Pump No. 5 and No. 6. Little work has been completed to date on Pump No.4 and it is nearing the end of its useful life.

Planning activities were completed in FY 2023 and early FY 2024 for Pump No. 4 with plans to complete any necessary replacement, rehabilitation, and improvement in FY 2024.

**Benefits:** replaces or extends useful life of aging assets, may reduce energy use

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
Planning	\$0	\$0	\$0	\$0	\$0	\$0
Design/Land	\$65,000	\$0	\$0	\$0	\$0	\$65,000
Construction	\$200,000	\$0	\$0	\$0	\$0	\$200,000
Inspection	\$20,000	\$0	\$0	\$0	\$0	\$20,000
Construction Admin	\$20,000	\$0	\$0	\$0	\$0	\$20,000
Contingency	\$20,000	\$0	\$0	\$0	\$0	\$20,000
TOTAL	\$325,000	\$0	\$0	\$0	\$0	\$325,000

**Current Status:** Planning complete

## 272-63 PFAS Study, Design and Treatment

### Description/Background:

In 2023 the Environmental Protection Agency (EPA) announced proposed national primary drinking water regulations for the perfluoroalkyl substances (PFAS) PFOA, PFOS and four other PFAS compounds. This project funds the study, treatment selection, design, and subsequent construction of PFAS treatment at the WTP. Funds are also included in this line item for a high-level overall understanding of PFAS in OWASA's system including source water, wastewater and biosolids.

FY 2024 funds are for study of treatment alternatives and the start of design efforts. Later years of funding are focused on continuing design and then construction of a new treatment technology at the WTP. The cost of PFAS regulatory compliance will be updated and adjusted as OWASA identifies the best treatment approach and construction delivery method.

**Benefits:** regulatory compliance

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$300,000	\$0	\$0	\$0	\$0	\$300,000
<b>Design/Land</b>	\$450,000	\$1,200,000	\$400,000	\$0	\$0	\$2,050,000
<b>Construction</b>	\$0	\$1,500,000	\$9,000,000	\$17,000,000	\$12,900,000	\$40,400,000
<b>Inspection</b>	\$0	\$150,000	\$400,000	\$800,000	\$700,000	\$2,050,000
<b>Construction Admin</b>	\$0	\$150,000	\$400,000	\$800,000	\$700,000	\$2,050,000
<b>Contingency</b>	\$50,000	\$200,000	\$800,000	\$1,400,000	\$1,200,000	\$3,650,000
<b>TOTAL</b>	<b>\$800,000</b>	<b>\$3,200,000</b>	<b>\$11,000,000</b>	<b>\$20,000,000</b>	<b>\$15,500,000</b>	<b>\$50,500,000</b>

**Current Status:** Planning underway, design RFQ expected to be released in FY 2024

## 272-65 Water Supply and Treatment Condition Assessments

### Description/Background:

The WTP has identified the need to assess the condition of several processes, including structures and pumping systems.

Condition assessment items are planned to include the following:

- FY 2024: Nunn Mountain and Calvander Pump Stations; I-40 and Hwy 54 Booster Pump Stations
- FY 2025: SuperPulsators and Upflow Clarifiers
- FY 2026: Concrete, Tile, Joints, and Sealants at flocculation chamber, sedimentation basins, solids handling building, solids equalization basin, and operator's building at the WTP

Each FY is planned to have a separate solicitation or on-call services will be utilized.

**Benefits:** determines asset risk

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
Planning	\$90,000	\$90,000	\$90,000	\$0	\$0	\$0
Design/Land	\$0	\$0	\$0	\$0	\$0	\$0
Construction	\$0	\$0	\$0	\$0	\$0	\$120,000
Inspection	\$0	\$0	\$0	\$0	\$0	\$10,000
Construction Admin	\$0	\$0	\$0	\$0	\$0	\$10,000
Contingency	\$10,000	\$10,000	\$10,000	\$0	\$0	\$10,000
TOTAL	\$100,000	\$100,000	\$100,000	\$0	\$0	\$150,000

**Current Status:** Equipment Procurement

## Category 273: Drinking Water Pumping

### **Background**

Following treatment at the Water Treatment Plant (WTP), drinking water must be pumped into OWASA's distribution system for delivery to and use by our customers. The WTP is located at an elevation of 470 feet above mean sea level (MSL); however, many parts of our service area are located at higher elevations. To maintain adequate water pressure throughout the service area, drinking water must be pumped up into elevated storage tanks, where it then flows by gravity to our customers. The topography of our service area varies widely; therefore, we have divided our distribution system into areas of similar elevation and, therefore, pressures. These areas are called "pressure zones." Most of the distribution system is in the 642-foot pressure zone (the maximum water storage level in elevated tanks is set at 642 feet MSL). The north-central and northwestern portions of OWASA's distribution system are in the 740-foot pressure zone (the maximum storage level in elevated tanks is set at 740 feet MSL).



I-40 Booster Pump Station

The pumping capacity needed for water distribution is based on peak daily and hourly demands, plus requirements for fire protection. In order to provide uninterrupted service during equipment outages, pumps are sized and configured to satisfy maximum demands with the largest pump at each particular location out of service.

To ensure the reliability of drinking water service to the community, OWASA maintains water system interconnections with the City of Durham, Town of Hillsborough, and Chatham County water systems. We have booster pump stations at two of our interconnections to ensure adequate flow and pressure during periods of water transfers.

(Please note that this section of the CIP does not address the drinking water pumps located at the WTP, which are discussed in Category 272.)

### **Existing Facilities**

OWASA's pump station at the base of the 740-foot zone elevated tank on Nunn Mountain contains two pumps rated at 3 million gallons per day (MGD) to transfer water from the 642-foot pressure zone ground level storage tank on Nunn Mountain up to the adjacent 740-foot pressure zone elevated tank.

A drinking water booster pump station was added in 1987 to the 16-inch water main along Old N.C. 86 at the intersection of Old Fayetteville Road and Hillsborough Road south of Calvander.

In FY 2003, OWASA completed a hydraulic study that evaluated the existing and potential capability to transfer drinking water from the City of Durham to OWASA through the two existing interconnections with the Durham system. Transfers of drinking water may occur either under planned or emergency conditions, when OWASA supply, treatment, and/or distribution facilities cannot meet drinking water demands within

the service area.

In accordance with the study recommendations, OWASA replaced the existing booster pump station at Old Chapel Hill Road and I-40; removed the Cooper Street and Ephesus Church Road pump stations in FY 2008; and installed a new 16-inch diameter water transmission line along Old Durham Road. Together, these improvements have resulted in an increased transfer capacity from approximately 3.5 MGD to approximately 6 MGD. In May 2021, OWASA participated with Durham in a coordinated full-scale field test to confirm the two-way water transfer capacities of the existing I-40 OWASA-Durham interconnection.

The second pump station is located along NC Highway 54 at Finley Golf Course Road (see Planned Improvements below).

Detailed hydraulic studies of the 740-foot and 642-foot pressure zones were completed in FY 2006 and FY 2011. FY 2006 study results were incorporated into the FY 2011 study, which provided a calibrated system-wide hydraulic model. The FY 2011 study confirmed that upgrades would be needed at the Calvander Pump Station by FY 2021 to meet projected future water demands in the 740-foot pressure zone.

A subsequent study and modeling effort identified system improvements needed to enable us to temporarily take the Nunn Mountain ground and elevated storage tanks off-line for maintenance. In accordance with the study recommendations, improvements to the Calvander Pump Station were completed in FY 2014. That project satisfied the Nunn Mountain tank's maintenance needs and the hydraulic needs identified in the FY 2011 study. No other capital improvements to the drinking water pumping system were identified by the study.

### **Planned Improvements**

A 2002 interconnection capacity study recommended the installation of a new booster pump station at Barbee Chapel Road to replace the station at NC Highway 54 and Finley Golf Course Road, as well as accompanying transmission line improvements along Stancell Drive. Those improvements are expected to increase the total drinking water transfer capacity from Durham to OWASA to approximately 8.5 MGD. A current project is underway to update OWASA's hydraulic model to further inform the timing and capacity needs of a new N.C. Highway 54 pump station, however there are planned improvements necessary in the five-year CIP at the existing NC Highway 54 pump station as well as the potential future Barbee Chapel Booster Pump Station.

**Category 273: Drinking Water Pumping**

		FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Five-Year Total
273-26	Highway 54 Booster Pump Station Rehabilitation	\$75,000	\$0	\$0	\$0	\$0	\$75,000
273-09	Barbee Chapel Road Booster Pump Station	\$0	\$0	\$0	\$0	\$68,000	\$68,000
<b>273</b>	<b>Category Total</b>	<b>\$75,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$68,000</b>	<b>\$143,000</b>

## 273-26 Highway 54 Pump Station Rehabilitation

### Description/Background:

The Highway 54 Pump Station was built in 1980. Since construction it has been rehabilitated periodically. Pump replacement is planned for FY 2024.

**Benefits:** replaces or extends useful life of aging assets

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
Planning	\$0	\$0	\$0	\$0	\$0	\$0
Design/Land	\$0	\$0	\$0	\$0	\$0	\$0
Construction	\$70,000	\$0	\$0	\$0	\$0	\$70,000
Inspection	\$0	\$0	\$0	\$0	\$0	\$0
Construction Admin	\$0	\$0	\$0	\$0	\$0	\$0
Contingency	\$5,000	\$0	\$0	\$0	\$0	\$5,000
TOTAL	\$75,000	\$0	\$0	\$0	\$0	\$75,000

**Current Status:** Not yet started

## 273-09 Barbee Chapel Booster Pump Station

### Description/Background:

A 2002 planning study recommended the construction of a new booster pump station along the Highway 54 corridor near the service boundary with the City of Durham. The station would replace the existing booster pump station on Highway 54 near Finley Golf Course Road and is expected increase transfer capacity from Durham. Additional pipeline improvements would be required to serve the new pump station.

It is anticipated that hydraulic modeling to be completed in FY 2024 will inform the timing and the capacity of the needed improvements for the pump station. Funding for this capital project is currently included in FY 2028 to begin planning for the new pump station. It is anticipated that this pump station will increase the ability to reliably receive water from the City of Durham.

**Benefits:** increases operational redundancy and reliability

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
Planning	\$0	\$0	\$0	\$0	\$60,000	\$60,000
Design/Land	\$0	\$0	\$0	\$0	\$0	\$0
Construction	\$0	\$0	\$0	\$0	\$0	\$0
Inspection	\$0	\$0	\$0	\$0	\$0	\$0
Construction Admin	\$0	\$0	\$0	\$0	\$0	\$0
Contingency	\$0	\$0	\$0	\$0	\$8,000	\$8,000
TOTAL	\$0	\$0	\$0	\$0	\$0	\$68,000

**Current Status:** Not yet started



## Category 274: Drinking Water Storage

### **Background**

An essential component of the drinking water distribution system is the capacity to store drinking water to maintain adequate flows and pressure throughout the system during all demand conditions. By absorbing or “dampening” short-term variations in demand, drinking water storage provides important system-wide benefits, including:

- the ability to operate the water treatment plant (WTP) and pumping facilities at more stable and uniform rates. Among other benefits, this helps optimize facility operations and reduce energy costs;
- the ability to maintain adequate and uniform pressure throughout the system during periods of peak demand; and
- the availability of adequate emergency reserves for contingencies such as fire suppression, water treatment plant maintenance, or water main breaks.



Manning Drive Elevated Storage Tank

Drinking water storage facilities typically include clearwells, ground level tanks, and elevated tanks. Clearwells are usually located at a WTP and are sized to help maintain relatively constant production of treated water and to provide sufficient contact time for disinfection. Ground storage tanks are built at ground level, oftentimes at higher elevations than the surrounding service area. Elevated storage tanks are used when natural elevations are not high enough for ground storage to provide for gravity flow. Both types of storage help maintain stable flow and operating pressures throughout the distribution system.

State of North Carolina regulations require that the combined elevated and ground storage capacity meet at least 50 percent of the average annual daily demand of the service area. OWASA's existing drinking water storage facilities have a total capacity of 8 million gallons (MG). OWASA's system storage exceeds the State requirement, as average daily drinking water demand (finished water pumped to the distribution system) in fiscal year 2023 was about 6.7 million gallons per day (MGD). The ongoing update to the distribution system hydraulic model will continue to evaluate storage requirements, particularly looking at improvements that could be made in the 740-foot pressure zone.

### **Existing Facilities**

OWASA's existing facilities include the 1.5 MG underground clearwell at the WTP and five storage tanks located throughout the distribution system in Chapel Hill and Carrboro:

- An elevated tank on Manning Drive near the University of North Carolina (UNC) Hospitals provides 1 MG of storage capacity. This tank was built in 1957 with an overflow elevation of 642.5 feet MSL;
- An elevated tank built in 1976 and located off Old Fayetteville Road south of Hillsborough Road near McDougle School in Carrboro provides 0.5 MG of storage at an elevation of 642 feet MSL;
- A 3 MG ground level tank with an overflow elevation of 642 feet above mean sea level (MSL) was

built in 1977 on OWASA's 27-acre tract at Nunn Mountain;

- A 0.5 MG elevated tank with an overflow of 740 feet MSL was built at the Nunn Mountain site in 1984, which enabled the establishment of the 740-foot pressure zone to improve water pressure in the northern portion of the service area;
- An elevated tank located on OWASA's 17-acre parcel near McCauley Street (Hilltop Tank) was built in 1998 and provides 1.5 MG of storage in the 642-foot pressure zone with an overflow elevation of 645 feet MSL.

This information is summarized in the following table:

<b>Tanks</b>	<b>Size (MG)</b>	<b>Pressure Zone (ft)</b>
1. Clearwell at Water Plant	1.5	-----
2. Nunn Mountain Ground Storage Tank	3.0	642
3. Nunn Mountain Elevated Tank	0.5	740
4. Carrboro Elevated Tank	0.5	642
5. Hilltop Elevated Tank	1.5	642
6. Manning Drive Tank	1.0	642
<b>Total Storage</b>	<b>8.0</b>	

### **Planned Improvements**

Funding is included for planning a new 740-foot pressure zone elevated storage tank.

<b>Category 274: Drinking Water Storage</b>						
	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Five-Year Total</b>
274-16 New 740 Foot Pressure Zone Elevated Storage Tank	\$0	\$0	\$0	\$0	\$ 312,000	\$312,000
<b>274 Category Total</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$312,000</b>	<b>\$312,000</b>

## 274-16 New 740-Foot Pressure Zone Elevated Storage Tank

### Description/Background:

Previous modeling indicated that a new 740-foot pressure zone elevated storage tank would be needed online by year 2030. The updates to the distribution system hydraulic model that are expected to be complete by FY 2024 will further evaluate expected future demands and distribution system storage requirements and provide recommendations on timing and capacity needs for another elevated storage tank. Funds are provided in FY 2028 to begin planning and design for a new storage tank.

**Benefits:** increases operational efficiency, reduces operational risk

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$200,000	\$200,000
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$100,000	\$100,000
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$0	\$0	\$0	\$0	\$12,000	\$12,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$312,000</b>	<b>\$312,000</b>

**Current Status:** Not yet started

## Category 275/375: Drinking Water Transmission and Distribution

### Background

The drinking water transmission and distribution system is designed to deliver an adequate volume of high-quality water at sufficient pressures to meet all demands of the service area, including adequate flows for fire protection.

### Existing Facilities

OWASA's drinking water is distributed through approximately 385 miles of water mains and lines ranging from 2 to 24 inches in diameter. Various pipe materials have been used over the years, including cast-iron (CI), ductile iron (DI), polyvinyl chloride (PVC), galvanized steel, copper, and asbestos-cement (AC). The distribution system also includes about 2,300 fire hydrants and over 13,400 valves.

Since beginning operations in 1977, OWASA has utilized a systematic replacement program for aging water distribution mains. Under this program, projects are identified or triggered by the following conditions:

- where existing pipe conditions impair water quality;
- where there are serious risks to water service reliability;
- where the costs of repairing pipes and leaks have become excessive;
- where line breaks may result in major damage; and
- where capacity is no longer adequate

OWASA catalogs the risk conditions listed above using the following sources: a system hydraulic model, a risk-based pipe prioritization model:

- In 2022, a new and updated hydraulic model was initiated. A new feature of this model is that it utilizes OWASA's AMI data to create diurnal curves representing water usage patterns for different types of land use types and critical customers. The model is expected to be complete in FY 2024 and provide information for future capital project needs in the water distribution system.
- In 2011, a hydraulic model of the water distribution system was developed as an update to the existing model, to identify and prioritize any areas of capacity and/or pressure concerns that need to be addressed in OWASA's water system through 2030. It determined that OWASA's distribution system has relatively few hydraulic deficiencies, and that near-term investment requirements are not significant.



Paving over the water main installation at night in South Estes Drive

- In 2020, as part of a comprehensive Distribution System Management Plan Update, OWASA updated its detailed distribution system prioritization model, which systematically evaluates and prioritizes water mains for replacement. This model relies on a statistical analysis of historical breaks to define pipe deterioration drivers for water main failures and determine potential failure patterns. The detailed understanding of failure patterns was combined with criteria regarding the consequence of specific main failures to develop the risk prioritization framework to guide decisions on replacement projects.

### **Recent Improvements**

An average of 1.6 miles per year of new or replacement water mains have been installed over the past 10 years. This total does not include new or replacement water mains installed as “development services” projects. (Development Services projects are those that are not paid for and completed by OWASA or its contractors.)

### **Planned Improvements**

The CIP includes \$16.8 million within this category for improvements to increase the reliability of the water system and to ensure a sufficient water supply at adequate pressure to areas undergoing development.

OWASA continues to seek opportunities to work with the North Carolina Department of Transportation (NCDOT), the Town of Chapel Hill, and the Town of Carrboro to replace water mains in conjunction with roadway construction and other planned public and private improvement projects. This approach funded under [CIP 275-15](#) helps minimize disturbances in local neighborhoods and reduces project costs through economies of scale.

OWASA crews and private contractors will replace over 6.3 miles of aging water mains (about 1.6% of the system) in the five-year period through the projects funded in this category, including some notable projects at West Rosemary Street ([275-95](#)), the Briarcliff and Ridgefield neighborhood ([375-01](#)) and the Scarlett-Cooper neighborhood ([275-20](#)).

The update to the Distribution System Hydraulic Model ([275-53](#)), in conjunction with updated projections of future demand conditions as part of the [Long Range Water Supply Plan](#), will identify any recommended improvements to improve hydraulic conditions within the system in the coming years.

### Category 275/375: Drinking Water Transmission and Distribution

		FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Five-Year Total
275-01	Lead and Copper Rule Revisions Compliance	\$250,000	\$100,000	\$0	\$0	\$0	<b>\$350,000</b>
275-03	South Elliot Road Water Main	\$0	\$0	\$0	\$75,000	\$250,000	<b>\$325,000</b>
275-15	Reimbursement for Distribution System Improvements	\$115,000	\$0	\$0	\$0	\$0	<b>\$115,000</b>
275-20	Water Distribution System Rehabilitation	\$994,000	\$1,000,000	\$1,500,000	\$1,500,000	\$1,500,000	<b>\$6,494,000</b>
275-21	Water Main Replacement Program FY 2018-2023	\$1,115,000	\$0	\$0	\$0	\$0	<b>\$1,115,000</b>
275-53	Distribution System Hydraulic Model	\$250,000	\$30,000	\$30,000	\$30,000	\$30,000	<b>\$370,000</b>
275-95	West Rosemary Water Main Replacement	\$200,000	\$100,000	\$4,676,000	\$562,000	\$0	<b>\$5,538,000</b>
275-98	Fordham at Eastowne Water Main Replacement	\$0	\$0	\$0	\$0	\$125,000	<b>\$125,000</b>
275-99	Distribution System Condition Assessment Program	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	<b>\$150,000</b>
375-01	High Likelihood of Failure Water Main Replacements	\$50,000	\$200,000	\$1,000,000	\$1,000,000	\$0	<b>\$2,250,000</b>
<b>275/ 375 Category Total</b>		<b>\$3,004,000</b>	<b>\$1,460,000</b>	<b>\$7,236,000</b>	<b>\$3,197,000</b>	<b>\$1,935,000</b>	<b>\$16,832,000</b>

## 275-01 Lead and Copper Rule Revisions Compliance

### Description/Background:

On December 16, 2021, the Environmental Protection Agency (EPA) announced next steps to strengthen the regulatory framework on lead and copper in drinking water through the Lead and Copper Rule Revisions (LCRR).

This project provides funding for the initial phases of LCRR compliance through development of the material service line inventory, development of lead service line replacement plans and public education and outreach, among other tasks. During the service line inventory task, OWASA does not anticipate finding any lead service lines. However, plans will be prepared for any required service line replacement should it become necessary. Funding in is planned for FY 2024 to meet the compliance deadline. Additional funding is identified in FY 2025 for ongoing work for regulatory compliance.

**Benefits:** replaces aging assets; increases operational reliability

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$220,000	\$90,000	\$0	\$0	\$0	\$310,000
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$30,000	\$10,000	\$0	\$0	\$0	\$40,000
<b>TOTAL</b>	\$250,000	\$100,000	\$0	\$0	\$0	\$350,000

**Current Status:** Under contract

## 275-03 South Elliot Road Water Main Replacement

### Description/Background:

This project includes the replacement of an existing 8-inch diameter asbestos cement water main with new 8-inch ductile iron for 1,550 feet along South Elliot Road from East Franklin Street to Fordham Boulevard. The project was identified by the Distribution System Prioritization Model.

Funding is included in FY 2027 for planning and design with construction starting in FY 2028.

**Benefits:** replaces aging assets; improves service reliability

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
Planning	\$0	\$0	\$0	\$20,000	\$0	\$20,000
Design/Land	\$0	\$0	\$0	\$50,000	\$150,000	\$200,000
Construction	\$0	\$0	\$0	\$0	\$85,000	\$85,000
Inspection	\$0	\$0	\$0	\$0	\$5,000	\$5,000
Construction Admin	\$0	\$0	\$0	\$0	\$5,000	\$5,000
Contingency	\$0	\$0	\$0	\$5,000	\$5,000	\$10,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$75,000</b>	<b>\$250,000</b>	<b>\$325,000</b>



**Current Status:** Not yet started



## 275-15 Reimbursement for Distribution System Improvements

### Description/Background:

Funds are allocated in this project to reimburse other entities (NCDOT, Town of Chapel Hill, Town of Carrboro, private developers) for constructing improvements to the distribution system at OWASA's request in conjunction with external projects. The improvements consist of upgrading pipe materials, increasing the water main size, extending the limits of replacement, etc. above and beyond the requirements of the external project. Installation is accomplished through construction by the other party, and OWASA reimburses the incremental cost per the terms of negotiated agreements. Many of the agreements listed are still being negotiated, and the anticipated scope and timing of funds is based on information available at time of budget development.

### Anticipated project funding:

<u>Location</u>	<u>Project Owner</u>	<u>System Improvements</u>
Estes Bike & Pedestrian Improvements	Town of Chapel Hill	Water main installation and upsizing
Amity Court and Andrews Court	Developer	Water main and meter box replacements

**Benefits:** replaces aging assets; increases operational reliability

### Funding:

	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>FY 2028</b>	<b>5-Year Total</b>
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction</b>	\$115,000	\$0	\$0	\$0	\$0	\$115,000
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>TOTAL</b>	\$115,000	\$0	\$0	\$0	\$0	\$115,000

**Current Status:** Under construction

## 275-20 Water Distribution System Rehabilitation

### Description/Background:

This line item consists of ongoing water main, isolation valve, and meter vault replacement projects, as well as long term funding for distribution system recapitalization purposes. The majority of CIP 275-20 is being completed by OWASA's own construction crew and is composed of the following three elements:

1. **Water main replacements:** Most of the funding in FY 2024 through FY 2028 for this project line is dedicated to the replacement of aging water mains by OWASA's construction crew. These mains were identified for replacement through the consideration of their consequence and likelihood of failure as determined through the Water Main Prioritization Model. Streets identified for FY 2024 water main replacement projects include: Foxcroft Drive, Colony Woods Road, White Plains Road, Clover Lane, Lark Court, Heather Court, and portions of Scarlett Drive and Cooper Street.
2. **Water isolation valve installations:** The Water Main Prioritization Model update, completed in FY 2020, identified several opportunities throughout the distribution system where installation of isolation valves would be of particular benefit. Some of these identified valve installations have been completed. FY 2026 includes funding for the installation of an isolation valve at Boundary Street, which will be completed by an OWASA construction crew.
3. **Large meter vault installations:** Funding is provided in FY 2024 for the completion of replacing deteriorating vaults for large meters at the University Lake Apartments and Royal Park Apartments.

**Benefits:** replaces aging assets; improves service reliability

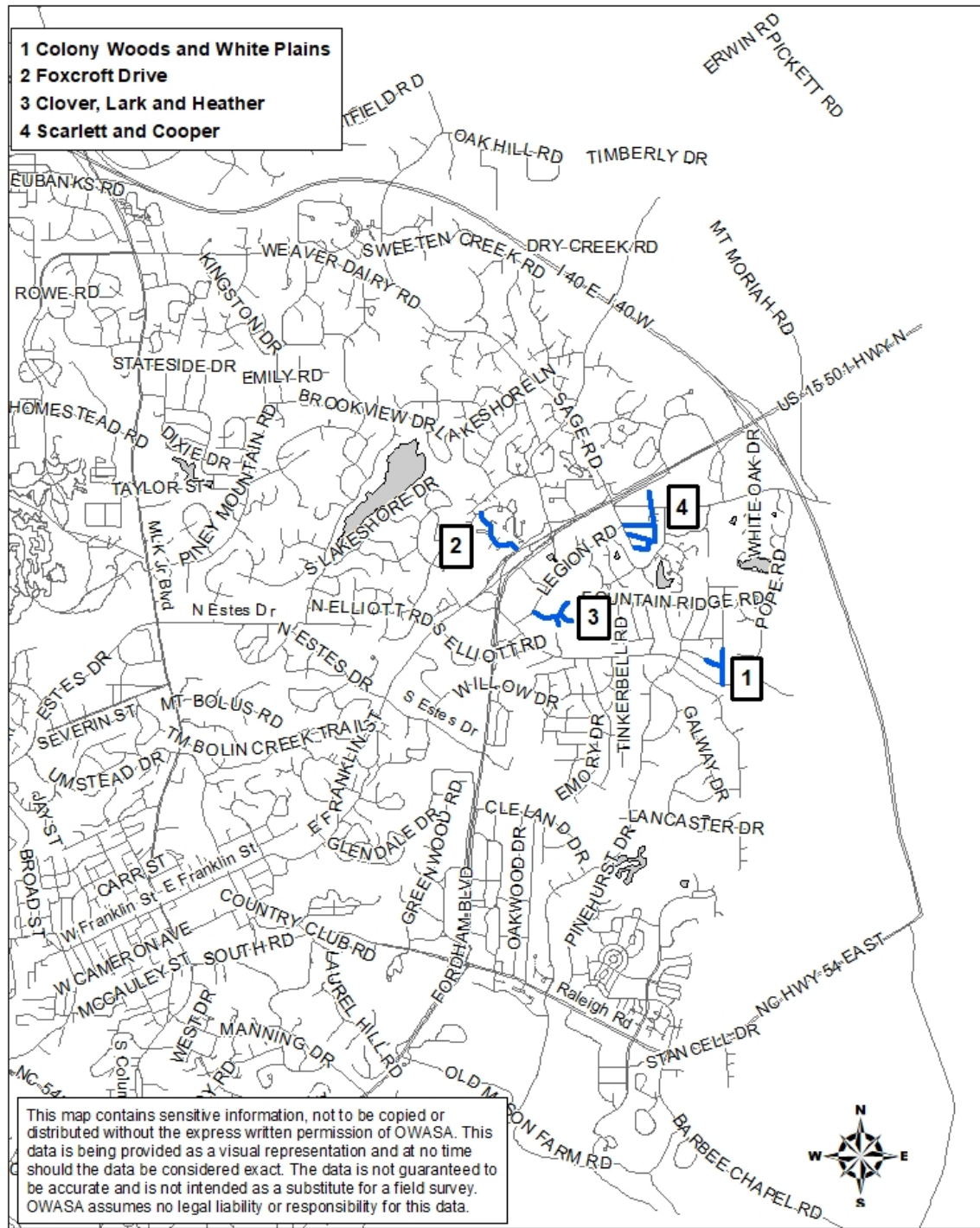
### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$150,000	\$150,000	\$100,000	\$150,000	\$150,000	\$700,000
<b>Construction</b>	\$600,000	\$700,000	\$1,000,000	\$1,150,000	\$1,150,000	\$4,600,000
<b>Inspection</b>	\$74,000	\$25,000	\$100,000	\$50,000	\$50,000	\$299,000
<b>Construction Admin</b>	\$70,000	\$25,000	\$100,000	\$50,000	\$50,000	\$295,000
<b>Contingency</b>	\$100,000	\$100,000	\$200,000	\$100,000	\$100,000	\$600,000
<b>TOTAL</b>	<b>\$994,000</b>	<b>\$1,000,000</b>	<b>\$1,500,000</b>	<b>\$1,500,000</b>	<b>\$1,500,000</b>	<b>\$6,494,000</b>

**Current Status:** Under Construction

## 275-20 Water Main Replacement Projects – FY 2024 Planned Replacements

### 275-20 WATER MAIN REHABILITATION AND REPLACEMENT FY 2024 Projects



## 275-21 Water Main Replacement Program FY 2018-2023

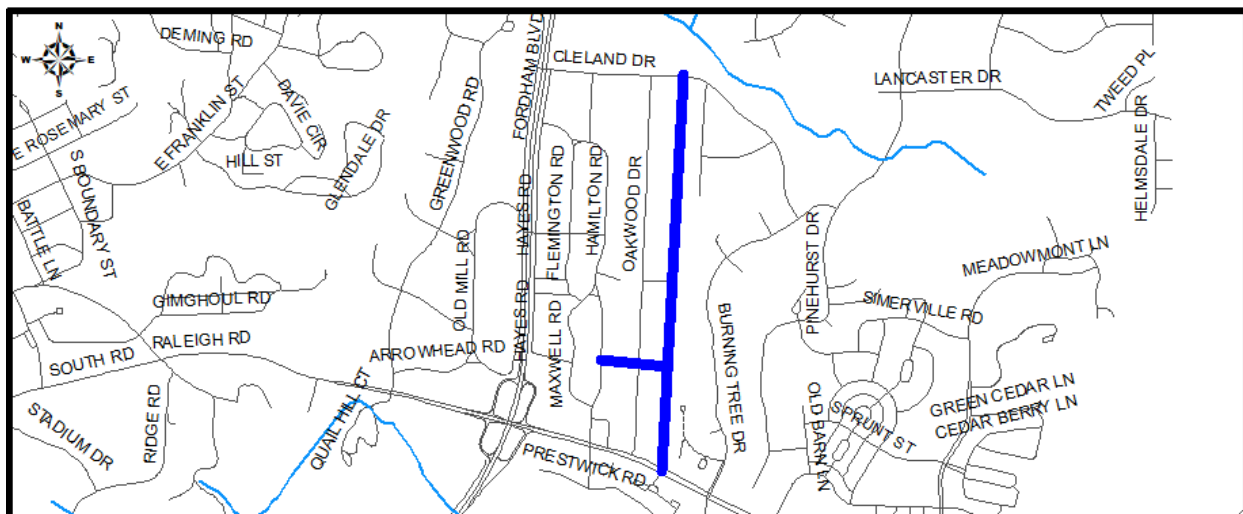
### Description/Background:

Initiated in 2018, this program was composed of water main replacements in critical locations as identified by either the Distribution System Prioritization Model or staff input. This multi-year program replaced 5.5 miles of water mains at nine locations. Funding in FY 2024 is to complete the construction of the final water main replacement project at Rogerson-Berkley shown below.

**Benefits:** replaces aging assets; improves service reliability

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	0
<b>Construction</b>	\$950,000	\$0	\$0	\$0	\$0	\$950,000
<b>Inspection</b>	\$60,000	\$0	\$0	\$0	\$0	\$60,000
<b>Construction Admin</b>	\$75,000	\$0	\$0	\$0	\$0	\$75,000
<b>Contingency</b>	\$30,000	\$0	\$0	\$0	\$0	\$30,000
<b>TOTAL</b>	<b>\$1,115,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$1,115,000</b>



**Current Status:** Under construction

## 275-53 Distribution System Hydraulic Model

### Description/Background:

Water distribution system hydraulic models are used to simulate current and projected future conditions in the system in order to plan and design pumps, pipes, and storage tanks. OWASA first developed a water distribution system model in 1982. It was a “skeletonized” model including only 12-inch diameter and larger transmission pipes and key 8-inch diameter pipes in addition to pumping and storage facilities. The model was updated in 1992 and again in 2000 as part of the Comprehensive Water and Sewer Master Plan. OWASA began developing an “all pipes” distribution system model as part of the Unidirectional Flushing project completed in 2004. That project combined OWASA’s GIS and the hydraulic model so that all the water pipes are represented in the model. The full pipe model was calibrated under current water demand conditions in 2006 and long-range water demand projections were added to the 740-pressure zone. In FY 2011, long-range water demand projections were added for the 642-foot pressure zone.

- Placeholder funding is included in FY 2024 through FY 2028 for on call hydraulic modeling of the distribution system.
- Funding in FY 2024 supports the completion of a full pipe model to account for pipes replaced or added to the system, changed demand conditions and demand projections from the [Long-Range Water Supply Plan](#). Additionally, placeholder funds are included each fiscal year for modeling simulations that may be required to support capital projects.

This hydraulic modeling effort will also revisit the desirability, conceptual alternatives, cost and timing of any potential improvements to the distribution system interconnection with the City of Durham’s distribution system along the Highway 54 corridor near Barbee Chapel Road. Additionally, the hydraulic modeling effort will also include a re-evaluation of the unidirectional flushing program.

**Benefits:** determines asset risk; identifies future capital investments

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$230,000	\$30,000	\$30,000	\$30,000	\$30,000	\$350,000
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$20,000	\$0	\$0	\$0	\$0	\$20,000
<b>TOTAL</b>	<b>\$250,000</b>	<b>\$30,000</b>	<b>\$30,000</b>	<b>\$30,000</b>	<b>\$30,000</b>	<b>\$370,000</b>

**Current Status:** Underway

## 275-95 West Rosemary Street Water Main Replacement

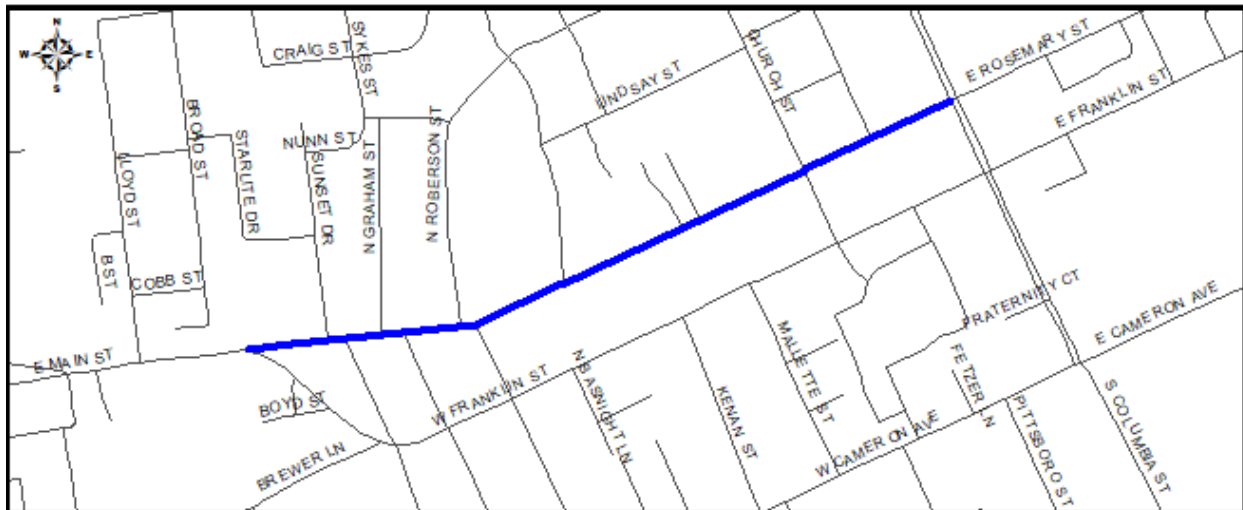
### Description/Background:

This project includes the replacement of existing 12-inch diameter asbestos cement water main with new 12-inch ductile iron for 5,500 feet along West Rosemary Street from South Columbia Street to East Main Street. The project was identified by the Distribution System Prioritization Model. The majority of construction is expected to occur in FY 2026.

**Benefits:** replaces aging assets; improves service reliability

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>		\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$180,000	\$90,000	\$0	\$0	\$0	\$270,000
<b>Construction</b>	\$0	\$0	\$4,076,000	\$462,000	\$0	\$4,538,000
<b>Inspection</b>	\$0	\$0	\$200,000	\$30,000	\$0	\$230,000
<b>Construction Admin</b>	\$0	\$0	\$200,000	\$30,000	\$0	\$230,000
<b>Contingency</b>	\$20,000	\$10,000	\$200,000	\$40,000	\$0	\$270,000
<b>TOTAL</b>	<b>\$200,000</b>	<b>\$100,000</b>	<b>\$4,676,000</b>	<b>\$562,000</b>	<b>\$0</b>	<b>\$5,538,000</b>



**Current Status:** In design

## 275-98 Fordham at Eastowne Water Main Replacement

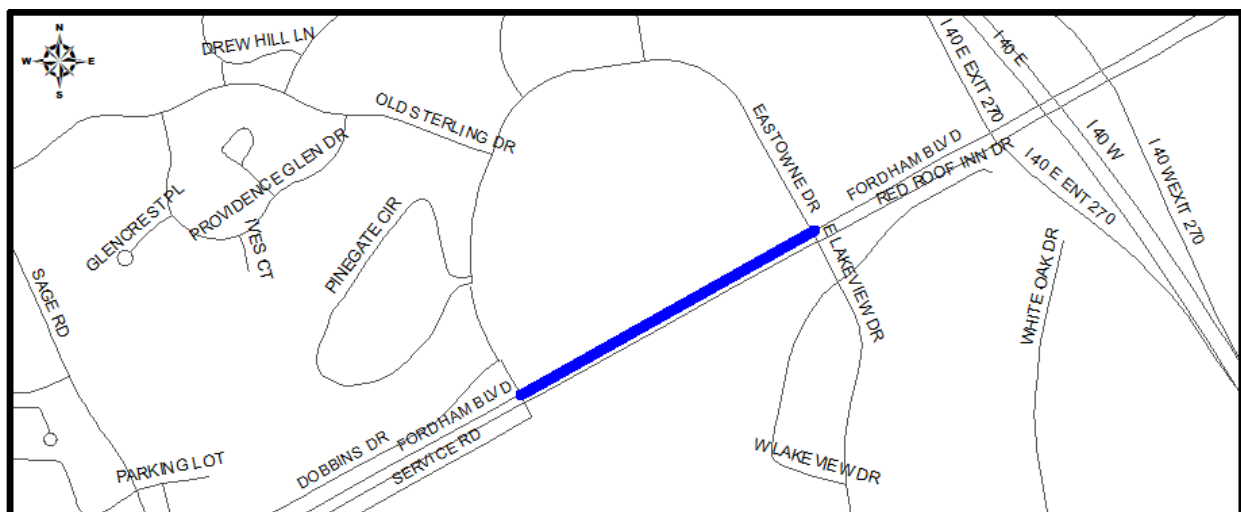
### Description/Background:

This project includes the replacement of existing 12-inch diameter asbestos cement water main with new 16-inch ductile iron for 1,500 feet along Fordham Boulevard in between the two entrances to Eastowne Drive. The project was identified by the Distribution System Prioritization Model and would provide a redundant avenue to receive water from the City of Durham via the I-40 Booster Pump Station. Construction is expected to occur in FY 2029.

**Benefits:** replaces aging assets; improves service reliability

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$100,000	\$100,000
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$0	\$0	\$0	\$0	\$25,000	\$25,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$125,000</b>	<b>\$125,000</b>



**Current Status:** Not yet started

## 275-99 Distribution System Asset Management

### Description/Background:

The Distribution System Management Plan provided a framework for the long-term incorporation of condition assessment activities for this asset class. Funding is provided for opportunistic assessment, leak detection, system analysis and pressure monitors.

- **Opportunistic Condition Assessment** – When a water main is exposed for any reason (e.g. service tap, break, valve replacement, water main replacement), it provides a cost-effective opportunity to gather pipe samples and soil samples for assessment since roughly 90% of the cost of testing is in accessing the pipe.
- **Distribution System Risk Modeling and Prioritization** – Improvements to better analyze water distribution system risk and asset replacement/rehabilitation strategies.
- **Leak Detection and Pressure Monitoring Equipment** – Leak detection and pressure monitoring in the distribution system can offer advanced warning about breaks as well as allow us to locate leaks and breaks faster and provide overall insight into the health of the underground infrastructure. A remote pressure monitors pilot was started in FY 2023 as part of [275-21](#).

Additional elements of the recommended condition assessment program may be added in future years as technology developments, pricing, and budget constraints allow.

**Benefits:** determines asset risk

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$125,000
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$25,000
<b>TOTAL</b>	<b>\$30,000</b>	<b>\$30,000</b>	<b>\$30,000</b>	<b>\$30,000</b>	<b>\$30,000</b>	<b>\$150,000</b>

**Current Status:** Procurement of pressure monitoring equipment, improvements to the prioritization model, continuation of opportunistic condition assessment



## 375-01 High Likelihood of Failure Water Main Replacements

### Description/Background:

In an effort to increase water main replacement rates for the highest likelihood of failure (LOF) areas, this program has identified several areas from the Distribution System Prioritization Model. Approximately 16,000 linear feet of asbestos cement (AC) water lines throughout the Briarcliff/Ridgefield neighborhood have been identified as the primary focus for funding in FY 2024 through FY 2027.

Additional neighborhoods with high LOF water mains may also be addressed through this program in current and future years as budget constraints allow.

**Benefits:** replaces aging assets; improves service reliability

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$45,000	\$180,000	\$0	\$0	\$0	\$225,000
<b>Construction</b>	\$0	\$0	\$845,000	\$845,000	\$0	\$1,690,000
<b>Inspection</b>	\$0	\$0	\$50,000	\$50,000	\$0	\$100,000
<b>Construction Admin</b>	\$0	\$0	\$50,000	\$50,000	\$0	\$100,000
<b>Contingency</b>	\$5,000	\$20,000	\$55,000	\$55,000	\$0	\$135,000
<b>TOTAL</b>	<b>\$50,000</b>	<b>\$200,000</b>	<b>\$1,000,000</b>	<b>\$1,000,000</b>	<b>\$0</b>	<b>\$2,250,000</b>

**Current Status:** Consultant solicitation

## Category 276/376: Wastewater Collection Lines

### **Background**

The wastewater (sewer) collection system represents a significant portion of the total investment in OWASA's wastewater infrastructure. Particular care is given to the materials and techniques of collection line construction as well as planning and design to accommodate long-term needs within the service area. OWASA carefully reviews plans for new development, enforces detailed standards and specifications, and inspects the construction of all new collection system components.

### **Existing Facilities**

The collection system serving Chapel Hill and Carrboro includes approximately 336 miles of pipe ranging in size from 6- to 60-inches in diameter, of which more than 80% is 8-inch diameter pipe. Ductile iron and vitrified clay represent more than 90% of pipe material by length, however the collection system also contains pipe materials such as reinforced concrete, cast iron, polyvinyl chloride (PVC), cured-in-place pipe (CIPP), and various other materials. The collection system also includes about 11,000 manholes and is configured in a network that generally provides gravity flow to the Wastewater Treatment Plant (WWTP) through four drainage basins: Bolin Creek, Booker Creek, Little Creek, and Morgan Creek. Flow from the Booker Creek, Little Creek, and Bolin Creek basins is conveyed to the Rogerson Drive Pump Station and pumped to the WWTP. Flow from the Morgan Creek basin is conveyed to the Morgan Creek Pump Station (located at the WWTP) and pumped to the plant headworks. The largest gravity line is a 60-inch diameter interceptor flowing into the Morgan Creek Pump Station. (An interceptor is a large collection line that receives wastewater from smaller collection lines throughout the drainage basin.)



Morgan Creek Aerial Crossing with Pedestrian Barricades

### **Recent Improvements**

OWASA completed a collection system master planning study in 2020 which identified and prioritized sewer system rehabilitation and replacement needs. The study included the development of a calibrated hydraulic model of the interceptors and critical collector pipes in the system, utilizing temporary flow monitors throughout the system, establishment of a revised design storm, and wastewater demand projections in alignment with the Long-Range Water Supply Plan Update projections. The study's recommendations were the basis for most of the projects shown in the FY 2024 – 2028 CIP for this asset class.

A preliminary condition assessment (done as part of a FY 2011 planning study) assigned priority rankings to all sewer mains for ongoing field-based condition evaluation. Field-based evaluations are being performed on targeted sewer mains (in priority order) to determine whether rehabilitation or replacement is warranted.

### **Planned Improvements**

The CIP includes slightly over \$23 million in planned improvements for this category. Projects are grouped into three general categories:

- Improvements to repair deteriorated pipe and reduce sources of stormwater inflow and groundwater infiltration; for various high-priority locations throughout the service area, funding is included in the OWASA's gravity rehabilitation programs ([276-18](#) and [276-19](#)). OWASA typically repairs existing, deteriorated lines by installing cured-in-place pipe (CIPP) liners or replacing individual segments between manholes. The combination of manhole rehabilitation and CIPP installation is an ongoing program at OWASA intended to reduce peak flows at the WWTP associated with stormwater infiltration into the collection system. By reducing inflow and infiltration, we reduce the energy required to pump and treat this water.
- Improvements needed to accommodate present flows; and
- Improvements to OWASA's "backbone" infrastructure as necessary to accommodate future flows resulting from anticipated growth. Notable capacity projects in the five-year CIP include Morgan Creek Interceptor at Bartram Drive and Phase 2([276-59](#)), and the Bolinwood Drive Interceptor ([276-45](#)).

Other notable projects in the five-year plan include upgrades to stream crossings to improve vehicular access for the operation and maintenance of our sanitary sewer interceptors ([276-53](#)) and improvements to the Rocky Branch interceptor to accommodate expected increases in process water discharge from the WTP ([276-52](#)).

### Category 276/376: Wastewater Collection Lines

		FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Five-Year Total
276-02	Large Gravity Sewer Condition Assessments	\$50,000	\$250,000	\$0	\$0	\$0	<b>\$300,000</b>
276-06	Westwood Neighborhood Sewer Replacement	\$0	\$0	\$0	\$100,000	\$300,000	<b>\$400,000</b>
276-07	Siphon Line Condition Assessment	\$0	\$50,000	\$0	\$0	\$0	<b>\$50,000</b>
276-18	Gravity Sewer Rehabilitation Program	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	<b>\$5,000,000</b>
276-45	Bolinwood Interceptor Replacement	\$50,000	\$0	\$0	\$0	\$0	<b>\$50,000</b>
276-52	Rocky Branch Interceptor Replacement	\$0	\$750,000	\$350,000		\$0	<b>\$1,100,000</b>
276-53	Creek Crossing Access Improvements - Burlage Circle, Elizabeth St & CH Tennis Club	\$50,000	\$450,000	\$355,000	\$0	\$0	<b>\$855,000</b>
276-59	Morgan Creek Interceptor Replacement (at Bartram Drive)	\$1,315,000	\$3,640,000	\$3,500,000	\$0	\$0	<b>\$8,455,000</b>
276-61	Brigham Rd Interceptor Replacement	\$0	\$50,000	\$170,000	\$1,100,000		<b>\$1,320,000</b>
276-70	Collection System On-Call Modeling	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	<b>\$100,000</b>
276-99	Collection System Asset Management	\$40,000	\$50,000	\$50,000	\$50,000	\$50,000	<b>\$240,000</b>
376-01	Gravity Sewer Rehab FY26-29	\$125,000	\$125,000	\$1,500,000	\$1,500,000	\$1,500,000	<b>\$4,750,000</b>
376-02	Creek Crossing Access Improvements - Bayberry Dr	\$65,000	\$0	\$0	\$0	\$0	<b>\$65,000</b>
376-03	Cobb Terrace Sewer Rehabilitation	\$50,000	\$150,000	\$450,000	\$0	\$0	<b>\$650,000</b>
376-04	Creek Crossing Access Improvements - Brookview Dr	\$0	\$0	\$0	\$100,000	\$0	<b>\$100,000</b>
<b>276/ 376 Category Total</b>		<b>\$2,765,000</b>	<b>\$6,535,000</b>	<b>\$7,395,000</b>	<b>\$3,870,000</b>	<b>\$2,870,000</b>	<b>\$23,435,000</b>

## 276-02 Large Gravity Sewer Condition Assessment

### Description/Background:

This project provides funding to inspect and survey aging gravity sewer mains larger than 12 inches in diameter. With current equipment and staff, OWASA crews are able to inspect gravity lines up to 12 inches but there are several miles of larger diameter pipe that are not inspected as frequently. These larger pipes often carry higher flows that do not accommodate our existing equipment or require bypass pumping to inspect. This project will provide for inspection of high-priority and prioritized large diameter gravity mains to aid in identifying future rehabilitation needs.

**Benefits:** determines asset risk

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$45,000	\$225,000	\$0	\$0	\$0	\$270,000
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$5,000	\$25,000	\$0	\$0	\$0	\$30,000
<b>TOTAL</b>	<b>\$50,000</b>	<b>\$250,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$300,000</b>

**Current Status:** Not yet started, consultant RFQ to be released in FY 2024

## 276-06 Westwood Neighborhood Sewer Replacement

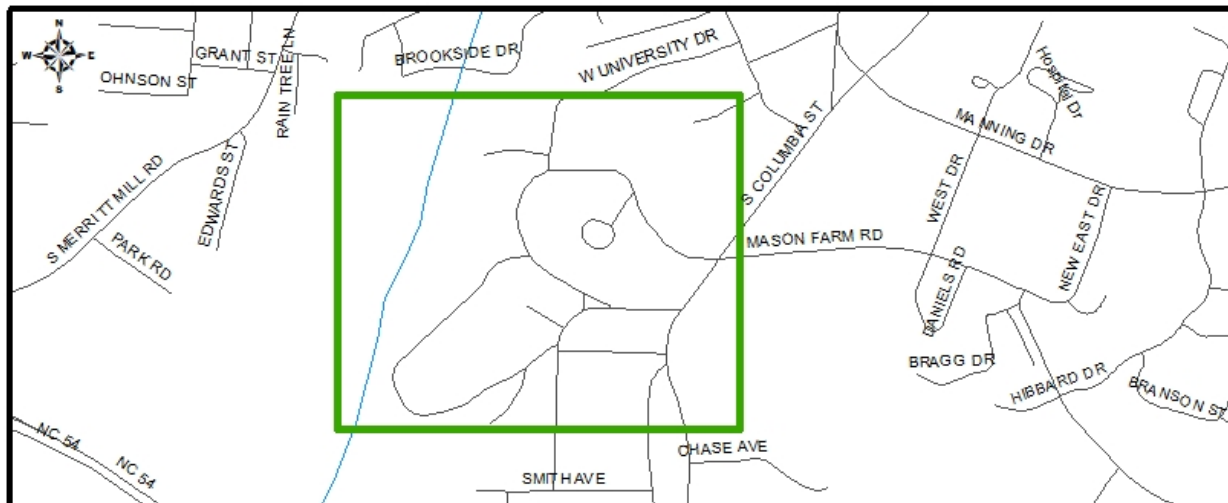
### Description/Background:

The Westwood neighborhood is serviced by vitrified clay sewer lines installed in the late 1940s. In 2013-2014, a condition assessment in this neighborhood indicated that over 3,000 linear feet of gravity sewer lines need to be replaced or have point repairs followed by cured-in place pipe lining. This project provides the funding in FY 2027 and FY2028 for the design and future funding is expected for the construction for the necessary work to repair and rehabilitate this aging sewer system within the Westwood neighborhood.

**Benefits:** maintains permit compliance through reduction of sanitary sewer overflows; replaces aging infrastructure; increases system capacity

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$30,000	\$25,000	\$55,000
<b>Design/Land</b>	\$0	\$0	\$0	\$65,000	\$225,000	\$290,000
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$0	\$0	\$0	\$5,000	\$50,000	\$55,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$100,000</b>	<b>\$300,000</b>	<b>\$400,000</b>



**Current Status:** Not yet started, consultant RFQ to be released in FY 2023

## 276-07 Siphon Line Condition Assessment

### Description/Background:

OWASA's collection system contains a siphon that was installed in 1974 that runs through the UNC Finley Golf Course paralleling the Rogerson Drive Force Main. Since its installation, it has required a relatively high level of maintenance due to grit accumulation and difficulty flushing. This project provides funding in FY 2025 for the condition assessment necessary to determine the asset risk. It is anticipated that the condition assessment completed as part of the FY 2025 work will inform future rehabilitation needs of the siphon line.

**Benefits:** determines asset risk, maintains permit compliance through reduction of sanitary sewer overflows

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$45,000	\$0	\$0	\$0	\$45,000
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$0	\$5,000	\$0	\$0	\$0	\$5,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$50,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$50,000</b>

**Current Status:** Not yet started; may be combined with 276-02 in FY 2024 solicitation

## 276-18 Gravity Sewer Rehabilitation Program

### Description/Background:

OWASA rehabilitates and repairs the wastewater collection system in order to maintain the integrity and reliability of the system and to reduce stormwater inflow and groundwater infiltration. These rehabilitation projects may include emergency sewer replacements or the correction of defective manholes and laterals, as well as rehabilitation of sewer mains and manholes shown to be warranted through inspections. Sewer rehabilitation and replacement design, construction, and inspection services may be performed by OWASA staff or by consultants and contractors.

Funding is provided in FY 2024 through FY 2028 for the rehabilitation of approximately 7.5 miles of sewer mains that were identified through prior inspections and current projects.

**Benefits:** reduces inflow and infiltration into collection system; maintains permit compliance through reduction of sanitary sewer overflows; replaces aging assets

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$500,000
<b>Construction</b>	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000	\$4,000,000
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$50,000
<b>Contingency</b>	\$90,000	\$90,000	\$90,000	\$90,000	\$90,000	\$450,000
<b>TOTAL</b>	<b>\$1,000,000</b>	<b>\$1,000,000</b>	<b>\$1,000,000</b>	<b>\$1,000,000</b>	<b>\$1,000,000</b>	<b>\$5,000,000</b>

**Current Status:** Under construction, additional services and construction to be solicited in FY 2024



## 276-45 Bolinwood Interceptor Replacement

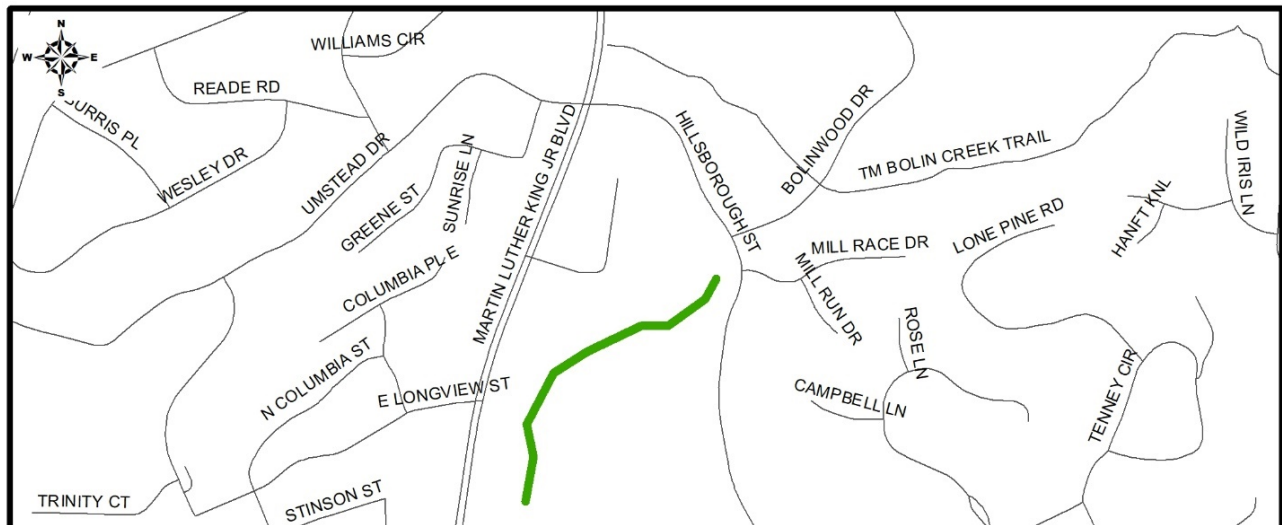
### Description/Background:

This project will address surcharging issues along a portion of the Bolinwood Drive Interceptor from north of Hillsborough Street and Mill Run Drive to the Mill Creek Apartments. The need for the project was initially identified as a result of flow monitoring conducted during the Sanitary Sewer Service Area Study completed in 2011. Preliminary engineering was completed in FY 2018. Design was completed in FY 2021. Funds are provided in FY 2024 to complete construction.

**Benefits:** maintains permit compliance through reduction of sanitary sewer overflows; replaces aging infrastructure

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction</b>	\$45,000	\$0	\$0	\$0	\$0	\$45,000
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$5,000	\$0	\$0	\$0	\$0	\$5,000
<b>TOTAL</b>	<b>\$50,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$50,000</b>



**Current Status:** Under Construction

## 276-52 Rocky Branch Interceptor Replacement

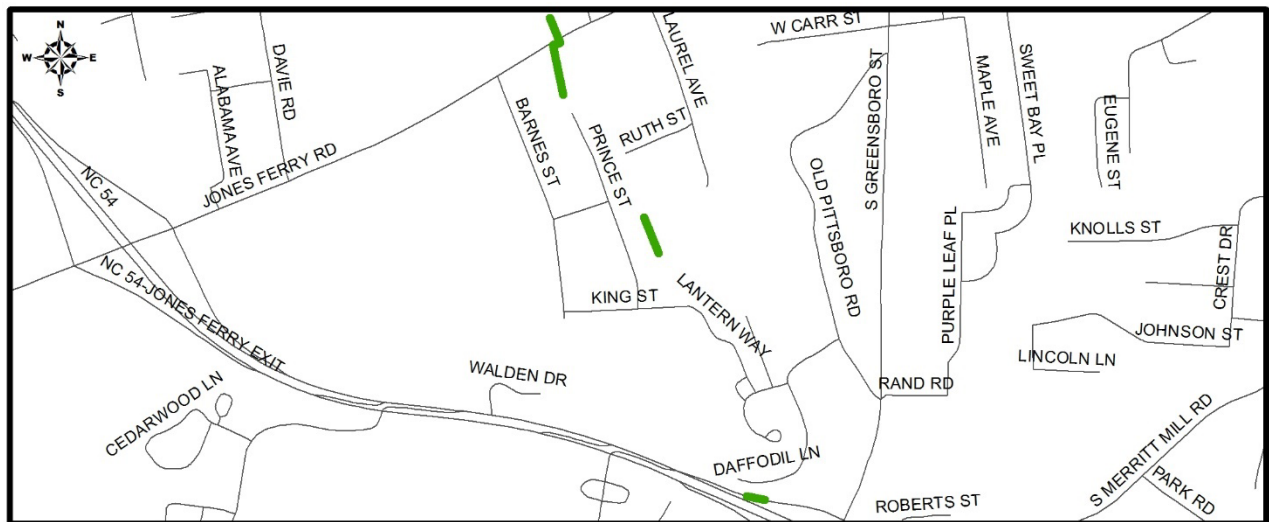
### Description/Background:

Funding is provided in FY 2025 and FY 2026 to increase pipe capacity at certain locations in the Rocky Branch Interceptor to allow for process water discharges from the WTP of up to 1,000 gpm. Design was completed in FY 2021. The portion of the project that crosses Jones Ferry Road was constructed as part of the Jones Ferry Road Water Main Replacements. The funding shown in FY 2025 and FY 2026 is for additional interceptor work shown to the south of Jones Ferry Road and further down on the map. Based on expected future demands, the WTP will need the upsized process water discharge capacity by FY 2027.

**Benefits:** maintains permit compliance through reduction of sanitary sewer overflows; replaces aging infrastructure

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
Planning	\$0	\$0	\$0	\$0	\$0	\$0
Design/Land	\$0	\$0	\$0	\$0	\$0	\$0
Construction	\$0	\$600,000	\$250,000	\$0	\$0	\$850,000
Inspection	\$0	\$50,000	\$30,000	\$0	\$0	\$80,000
Construction Admin	\$0	\$50,000	\$30,000	\$0	\$0	\$80,000
Contingency	\$0	\$50,000	\$40,000	\$0	\$0	\$90,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$750,000</b>	<b>\$350,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$1,100,000</b>



**Current Status:** Not yet started

## 276-53 Creek Crossing Access Improvements – Burlage Circle, Elizabeth Street & Chapel Hill Tennis Club

### Description/Background:

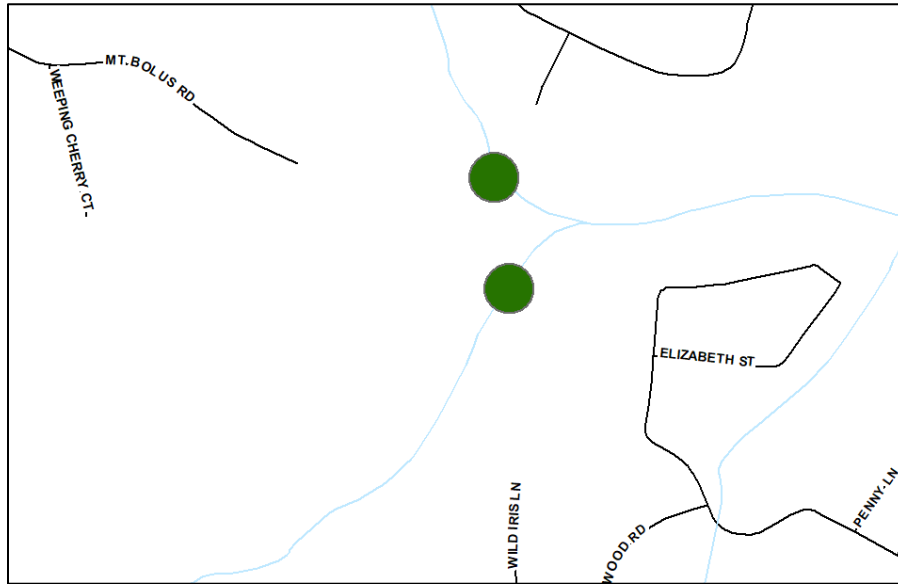
Streambank erosion from heavy rain events make it difficult for OWASA crews to safely cross area streams with equipment used to maintain the wastewater collection system. This project will develop solutions to improve “at grade” vehicle creek crossings adjacent to existing gravity sanitary sewer pipe creek crossings so crews/contractors can cross the creeks safely and with minimal environmental impacts at three high priority locations (as detailed on the maps on the following page). These locations have been identified by OWASA staff. Funding is provided for starting design in FY 2024 and construction being complete by FY 2026.

**Benefits:** reduces operational risk by improving vehicular access for maintenance purposes

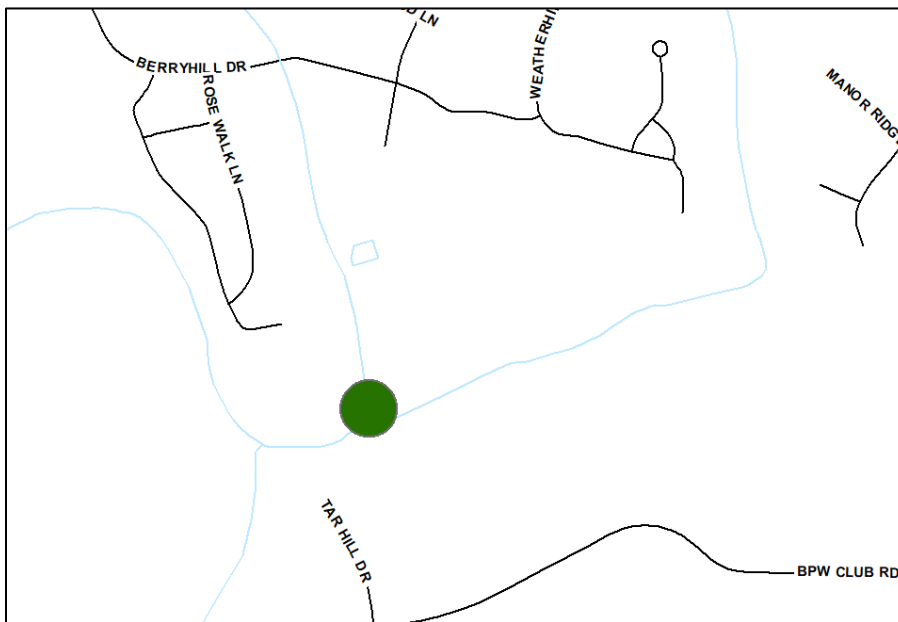
### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$45,000	\$90,000	\$0	\$0	\$0	\$135,000
<b>Construction</b>	\$0	\$280,000	\$300,000	\$0	\$0	\$580,000
<b>Inspection</b>	\$0	\$25,000	\$15,000	\$0	\$0	\$40,000
<b>Construction Admin</b>	\$0	\$25,000	\$15,000	\$0	\$0	\$40,000
<b>Contingency</b>	\$5,000	\$30,000	\$25,000	\$0	\$0	\$60,000
<b>TOTAL</b>	<b>\$50,000</b>	<b>\$450,000</b>	<b>\$355,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$855,000</b>

**Current Status:** Not yet started



Burlage Circle and Elizabeth Street



Tennis Court Site

## 276-59 Morgan Creek Interceptor Replacement

### Description/Background:

The Morgan Creek Interceptor Replacement project is broken into two phases: Phase 1 at Bartram Drive and Phase 2 which is downstream from Phase 1 adjacent to the WWTP. Phase 1 of the project was identified by the 2020 Collection System Master Plan and will upsize 2,000 LF of 24-inch gravity sewer to 36-inch pipe in the Morgan Creek Interceptor from manhole (MH) 64410 to MH 7475 in order to eliminate surcharging conditions at 21 manholes under existing peak wet weather conditions and to accommodate future capacity. Design and permitting is underway and construction is expected to start in late FY 2024.

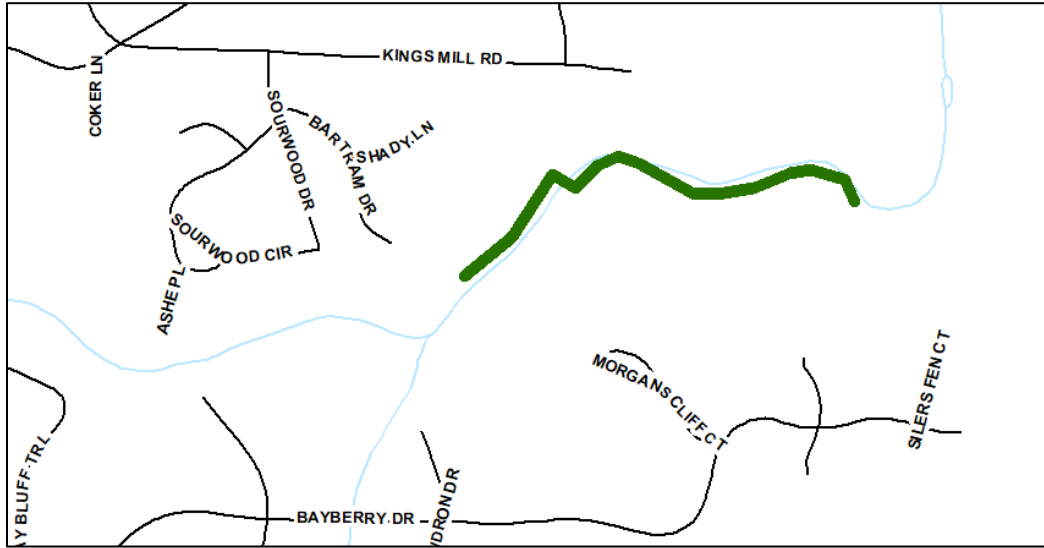
Phase 2 of the project was identified during the course of the design of the Morgan Creek Interceptor Replacement at Bartram Drive project. Additionally, changes to the expected flow in this interceptor are expected at rates higher than originally anticipated which now requires additional upsizing of this interceptor. This project will upsize an additional 850 LF of gravity sewer in the Morgan Creek Interceptor from MH 7483 to MH 28174. Design is expected to start in FY 2024 with construction starting in FY 2025.

**Benefits:** maintains permit compliance through reduction of sanitary sewer overflows; replaces aging infrastructure; increases system capacity

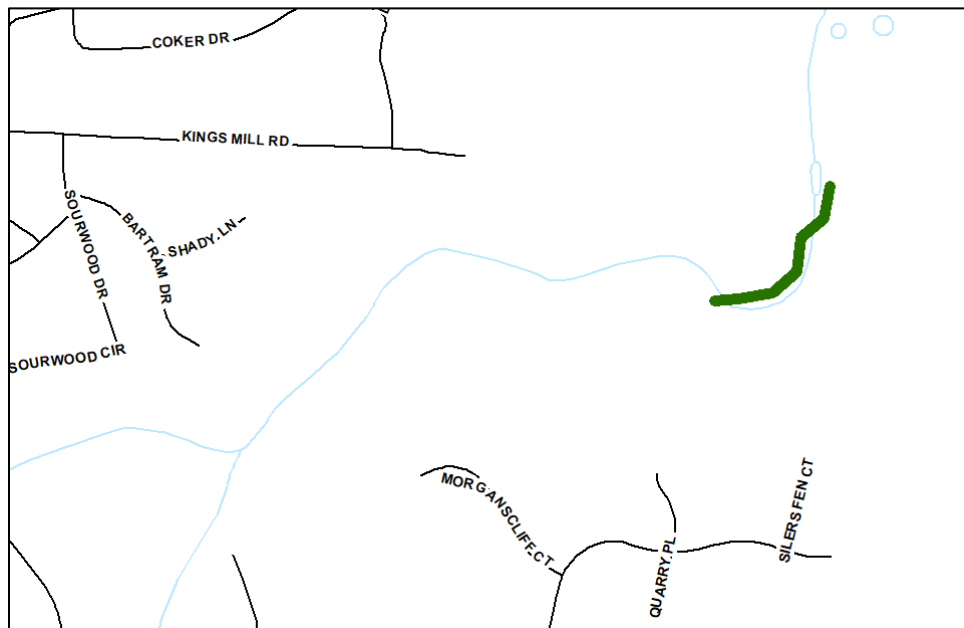
### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$75,000	\$300,000	\$0	\$0	\$0	\$375,000
<b>Construction</b>	\$1,000,000	\$3,000,000	\$3,000,000	\$0	\$0	\$7,000,000
<b>Inspection</b>	\$80,000	\$100,000	\$150,000	\$0	\$0	\$330,000
<b>Construction Admin</b>	\$80,000	\$100,000	\$150,000	\$0	\$0	\$330,000
<b>Contingency</b>	\$80,000	\$140,000	\$200,000	\$0	\$0	\$420,000
<b>TOTAL</b>	<b>\$1,315,000</b>	<b>\$3,640,000</b>	<b>\$3,500,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$8,455,000</b>

Phase 1



Phase 2



**Current Status:** In design

## 276-61 Brigham Road Sewer Replacement

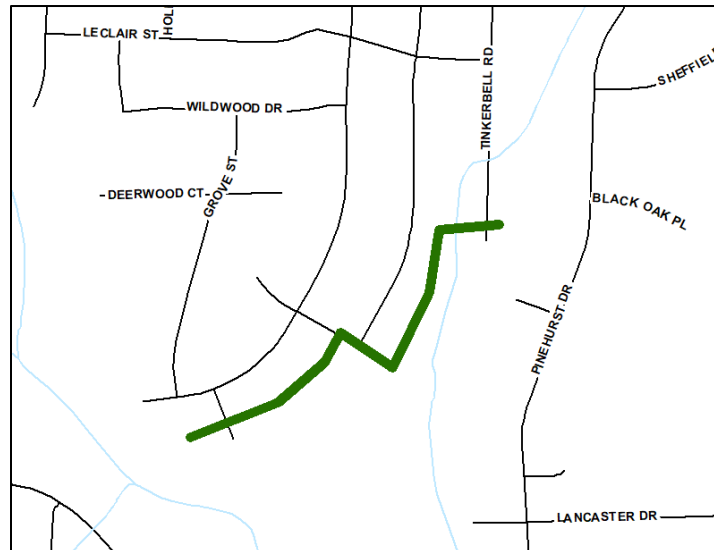
### Description/Background:

This project will address surcharging during existing peak wet weather conditions by upsizing 1,500 LF of 12-inch sewer to 16-inch pipe from manhole (MH) 3905 to MH 4256 along the Little Creek Interceptor. Construction is expected to occur in FY 2027.

**Benefits:** maintains permit compliance through reduction of sanitary sewer overflows; replaces aging infrastructure; increases system capacity

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$0	\$35,000	\$150,000	\$0	\$0	\$185,000
<b>Construction</b>	\$0	\$0	\$0	\$900,000	\$0	\$900,000
<b>Inspection</b>	\$0	\$0	\$0	\$60,000	\$0	\$60,000
<b>Construction Admin</b>	\$0	\$0	\$0	\$60,000	\$0	\$60,000
<b>Contingency</b>	\$0	\$15,000	\$20,000	\$80,000	\$0	\$115,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$50,000</b>	<b>\$170,000</b>	<b>\$1,100,000</b>	<b>\$0</b>	<b>\$1,320,000</b>



**Current Status:** Not yet started

## 276-70 Collection System On-Call Modeling

### Description/Background:

This project will provide funds for on-call modeling services related to the Collection System model completed in 2020. The model will be updated annually with pertinent changes in gravity sewer sizes, rehabilitation projects, upgrades to pump stations and Development Services projects. Efforts to update the model shall ensure that results from the model are accurate and allow for proper planning of capacity limitations as Development Services projects are evaluated.

**Benefits:** maintains accurate model data

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$100,000
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$20,000</b>	<b>\$20,000</b>	<b>\$20,000</b>	<b>\$20,000</b>	<b>\$20,000</b>	<b>\$100,000</b>

**Current Status:** Ongoing



## 276-99 Collection System Asset Management

### Description/Background:

The 2021 Asset Management Plan provided the framework for the long-term incorporation of activities that improve the understanding of this asset class. Funding is provided for the following components:

**Flow Monitoring and I/I Reduction** – This project provided funding for the installation of two flow monitors and rain gauges in the collection system in FY 2022. As an effort to gain more insight into inflow and infiltration (I/I), this project also provides funding for micromonitoring studies to investigate high priority basins within the collection system.

**Collection System Risk Modeling and Prioritization** – This project provides funding for improvements to better analyze collection system risk and asset replacement/rehabilitation strategies.

**Condition Assessment** - Additional funding is included in FY 2024 through 2028 for minor rehabilitation items identified in the Collection System Master Plan, such as condition assessment, typically to be completed by OWASA staff.

**Benefits:** maintains permit compliance through reduction of sanitary sewer overflows; replaces aging infrastructure, increases system capacity

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$30,000	\$40,000	\$40,000	\$40,000	\$40,000	\$190,000
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$50,000
<b>TOTAL</b>	<b>\$40,000</b>	<b>\$50,000</b>	<b>\$50,000</b>	<b>\$50,000</b>	<b>\$50,000</b>	<b>\$240,000</b>

**Current Status:** Ongoing

### 376-01 Gravity Sewer Rehab FY 2026 - 2029

#### Description/Background:

In an effort to increase the miles of gravity sewer rehab, this project provides funding for a multifaceted approach to gravity sewer rehab. This program will leverage technology to develop rehab logic, utilize existing gravity sewer inspection data, install pre and post rehab flow monitoring and train staff to develop rehab packages in the future.

Funding is provided in FY 2024 and FY2025 for planning and design with gravity sewer packages being released for construction in FY 2026 through FY 2028. The program has goals of rehabilitating at least 3 miles of gravity sewer per year starting in FY 2026.

**Benefits:** maintains permit compliance through reduction of sanitary sewer overflows; replaces aging infrastructure, increases system capacity

#### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$50,000	\$30,000	\$0	\$0	\$0	\$80,000
<b>Design/Land</b>	\$70,000	\$90,000	\$100,000	\$50,000	\$0	\$310,000
<b>Construction</b>	\$0	\$0	\$1,100,000	\$1,150,000	\$1,190,000	\$3,440,000
<b>Inspection</b>	\$0	\$0	\$100,000	\$100,000	\$150,000	\$350,000
<b>Construction Admin</b>	\$0	\$0	\$100,000	\$100,000	\$150,000	\$350,000
<b>Contingency</b>	\$5,000	\$5,000	\$100,000	\$100,000	\$10,000	\$220,000
<b>TOTAL</b>	<b>\$125,000</b>	<b>\$125,000</b>	<b>1,500,000</b>	<b>\$1,500,000</b>	<b>\$1,500,000</b>	<b>\$4,750,000</b>

**Current Status:** Ongoing

## 376-02 Creek Crossing Access Improvements - Bayberry Drive

### Description/Background:

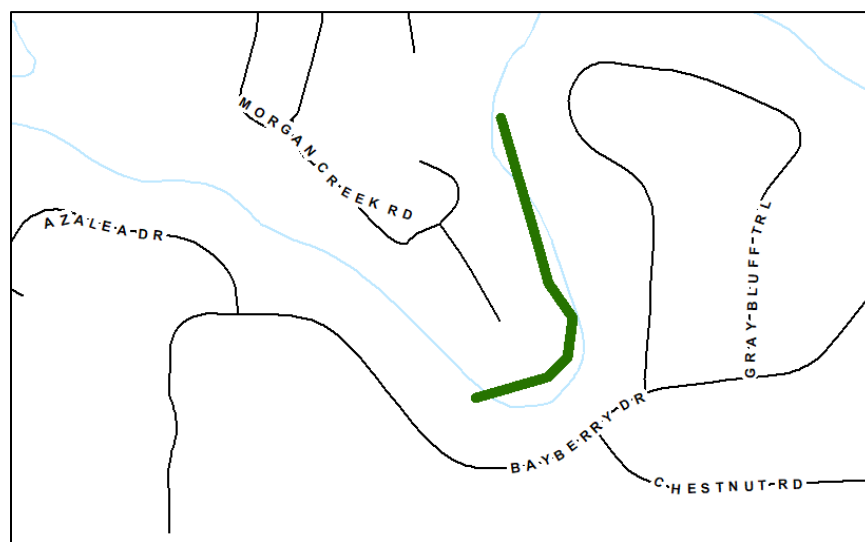
This project is located on Morgan Creek adjacent to Bayberry Drive. There is a 44-year old, 24-inch buried sewer crossing. The site currently needs access improvements due to the stream bank angle. In addition to access concerns, the pipeline may also become exposed as the creek continues to migrate. The stream crossing section, stream pattern and profile are very unstable and need to be addressed.

This project provides funding in FY 2024 for a study to identify the most cost-effective access and bank stabilization solution for this creek crossing.

**Benefits:** maintains permit compliance through reduction of sanitary sewer overflows; replaces aging infrastructure, increases system capacity

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
Planning	\$60,000	\$0	\$0	\$0	\$0	\$60,000
Design/Land	\$0	\$0	\$0	\$0	\$0	\$0
Construction	\$0	\$0	\$0	\$0	\$0	\$0
Inspection	\$0	\$0	\$0	\$0	\$0	\$0
Construction Admin	\$0	\$0	\$0	\$0	\$0	\$0
Contingency	\$5,000	\$0	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$65,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$65,000</b>



**Current Status:** Ongoing

### 376-03 Cobb Terrace Sewer Rehabilitation

#### Description/Background:

The gravity sewer line that runs behind Cobb Terrace has been identified as a point of potential future failure due to excessive erosion through that corridor. The sewer outfall is located in a floodway that has experienced changes and increased flow over recent years. This project provides funding for a study in FY 2024 and funding for easement acquisition, a study of options to protect or relocate the sewer line, and design of the recommended alternative in FY 2025. Funding is provided in FY 2026 for construction.

**Benefits:** maintains permit compliance through reduction of sanitary sewer overflows; replaces aging infrastructure, increases system capacity

#### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$20,000	\$10,000	\$0	\$0	\$0	\$30,000
<b>Design/Land</b>	\$25,000	\$120,000	\$0	\$0	\$0	\$145,000
<b>Construction</b>	\$0	\$0	\$400,000	\$0	\$0	\$400,000
<b>Inspection</b>	\$0	\$0	\$10,000	\$0	\$0	\$10,000
<b>Construction Admin</b>	\$0	\$0	\$10,000	\$0	\$0	\$10,000
<b>Contingency</b>	\$5,000	\$20,000	\$30,000	\$0	\$0	\$30,000
<b>TOTAL</b>	<b>\$50,000</b>	<b>\$150,000</b>	<b>\$450,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$650,000</b>



**Current Status:** Ongoing

## 376-04 Creek Crossing Access Improvements – Brookview Drive

### Description/Background:

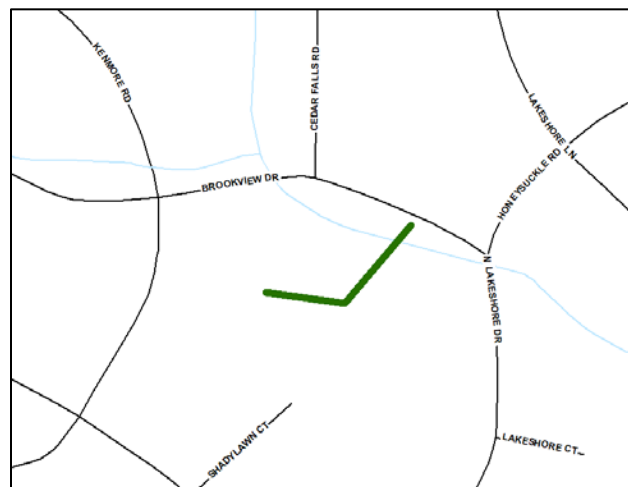
This project is located off Brookview Drive. The site currently needs access improvements due to the stream bank angle. In addition to access concerns, the pipeline may also become exposed as the creek continues to migrate. The stream crossing section, stream pattern and profile are very unstable and need to be addressed.

This project provides funding in FY 2024 to start design for the most cost-effective solution to this creek crossing, and for any necessary easement acquisition. Funding is provided in FY 2025 to complete design with construction anticipated to begin in FY 2026.

**Benefits:** maintains permit compliance through reduction of sanitary sewer overflows; replaces aging infrastructure, increases system capacity

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$20,000	\$10,000	\$0	\$0	\$0	\$30,000
<b>Design/Land</b>	\$25,000	\$120,000	\$0	\$0	\$0	\$145,000
<b>Construction</b>	\$0	\$0	\$400,000	\$0	\$0	\$400,000
<b>Inspection</b>	\$0	\$0	\$10,000	\$0	\$0	\$10,000
<b>Construction Admin</b>	\$0	\$0	\$10,000	\$0	\$0	\$10,000
<b>Contingency</b>	\$5,000	\$20,000	\$30,000	\$0	\$0	\$30,000
<b>TOTAL</b>	<b>\$50,000</b>	<b>\$150,000</b>	<b>\$450,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$650,000</b>



**Current Status:** Ongoing



## Category 277: Wastewater Pump Stations and Force Mains

### **Background**

Where feasible, wastewater collection lines are constructed with a downhill slope to allow wastewater to flow by gravity to the Wastewater Treatment Plant (WWTP). Where collection mains encounter a hill or become prohibitively deep, a pump station raises the wastewater to a level where it can flow again by gravity to the WWTP. Pump stations are essential for moving wastewater out of areas where gravity configurations are not feasible. Pump stations discharge wastewater to force mains, which are pressurized pipes that transmit wastewater to a gravity collection main or to the WWTP.



Rogerson Drive Pump Station

OWASA's goal is to reduce the number of wastewater pump stations and force mains to the lowest practical number. Where these facilities are necessary, OWASA strives to achieve 100 percent reliability.

### **Existing Facilities and Recent Improvements**

There are 21 pump stations and 14 miles of force mains in the service area. The pump stations at Rogerson Drive and Morgan Creek are the largest. The Rogerson Drive pump station collects all wastewater generated in the Bolin Creek, Booker Creek, and Little Creek drainage basins and conveys it via force main to the WWTP. The Morgan Creek pump station is located at and considered to be part of the WWTP. This pump station delivers all wastewater collected from the Morgan Creek basin into the plant.

Most of OWASA's wastewater pump stations are supported by permanent on-site electrical generators to provide standby power during outages. Out of the 21 total pump stations, 18 have permanent standby generators. Other reliability improvements have included the installation of standardized outlets to enable quick connection of portable generators during power outages, and the installation of pipes and valves to enable bypass pumping.

The Morgan Creek pump station was constructed as part of the 14.5 MGD Upgrade and Expansion Project for the WWTP in FY 2008. It includes four submersible pumps rated at 9.5 MGD each and has a firm pumping capacity of 30 MGD. All four pumps have variable frequency drives (VFDs) that allow adjustment of the pumping rate and help reduce the amount of electrical energy used for pumping. This station lies within the WWTP site and improvements are typically funded under [Category 278](#).

Other projects completed within the past 18 years include the expansion and upgrade of several existing facilities and the elimination ("phase out") of other pump stations through the construction of additional gravity sewer mains. The Heritage Hills pump station was improved in FY 2005 with a new wet well, new pumps, and controls. The North Forest Hills pump station was phased out in FY 2006, and the Piney Mountain pump station was replaced in FY 2007. The Lloyd Street and Starlite Drive pump stations were phased out in FY 2008, and the Cleland Drive pump station was phased out in FY 2009. The removal of these four wastewater pumping stations reduced OWASA's electrical energy use by about 17,000 kilowatt-hours per year.

Improvements to the Countryside pump station and the Forest Creek pump station were completed in FY 2012, while improvements at the Oaks 3 and Tinkerbell pump stations were completed in FY 2014.

The 8-inch diameter asbestos cement (AC) force main serving the Heritage Hills subdivision was replaced with an 8-inch diameter polyvinyl chloride (PVC) pipe in FY 2014. A FY 2016 study found the Manning Drive force main to be in good condition. Improvements to the Piney Mountain pump station, which is located outside of OWASA's service area, were completed in FY 2017. (The Piney Mountain Homeowners' Association, as the sole beneficiary of OWASA's Piney Mountain pump station and force main, pays all associated CIP, operational and maintenance expenses.).

Construction of improvements to the pump stations at Eastowne, Eubanks Road, and Meadowmont 1, as well as the rehabilitation of a portion of the Rogerson Drive Force Main between NC Highway 54 and South Hamilton Road were completed in FY 2018, as was an evaluation of potential redundancy alternatives for the Rogerson Drive Force Main.

A two-phased project to upgrade the electrical and HVAC systems and install channel grinders and odor control at the Rogerson Drive pump station was completed in FY 2020. The emergency repair of the Rogerson Drive Force Main along Rogerson Drive, and across and along the south side of Raleigh Road was also completed in FY 2020.

Additionally, some minor control and pump replacements were completed at several pump stations during FY 2021. The pumps at Meadowmont 1 were replaced with chopper pumps to improve pump clogging issues.

Construction started in FY 2023 to replace the pumps at the Chapel Hill North pump station, a generator study was completed in FY 2023 at North Lakeshore and Clayton Road pump stations and the procurement process for a new generator for Eastowne pump station has been started.



## **Planned Improvements**

The CIP includes an investment of about \$3.2 million for this asset class, primarily in asset assessments and rehabilitation of components at several smaller pump stations.

<b>Category 277: Wastewater Pump Stations and Force Mains</b>						
	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>FY 2028</b>	<b>Five-Year Total</b>
277-21 Force Main Condition Evaluation	\$0	\$0	\$50,000	\$0	\$50,000	<b>\$100,000</b>
277-43 Rogerson Drive Force Main and Pump Station Program Services	\$100,000		\$0	\$0	\$0	<b>\$100,000</b>
277-44 Rogerson Drive Pump Station Capacity Upgrade	\$0	\$0	\$0	\$100,000	\$200,000	<b>\$300,000</b>
277-45 Chapel Hill North Pump Station Rehabilitation	\$400,000	\$0	\$0	\$0	\$0	<b>\$400,000</b>
277-47 Rogerson Drive Fuel Storage Improvements	\$0	\$90,000	\$500,000	0	\$0	<b>\$590,000</b>
277-48 Lake Ellen Pump Station Rehabilitation	\$0	\$0	\$60,000	\$250,000	\$0	<b>\$310,000</b>
277-49 Eastowne Generator	\$50,000	\$0	\$0	\$0	\$0	<b>\$50,000</b>
277-50 Knolls Pump Station Evaluation	\$0	\$0	\$100,000	\$250,000	\$600,000	<b>\$950,000</b>
277-51 Piney Mountain Force Main Manhole Lining	\$15,000	\$0	\$0	\$0	\$0	<b>\$15,000</b>
277-52 Force Main ARV Replacements	\$80,000	\$350,000	\$0	\$0	\$0	<b>\$430,000</b>
<b>277 Category Total</b>	<b>\$550,000</b>	<b>\$90,000</b>	<b>\$710,000</b>	<b>\$600,000</b>	<b>\$850,000</b>	<b>\$2,800,000</b>

## 277-21 Force Main Condition Evaluation

### Description/Background:

This project includes field condition evaluation of collection system force mains as identified by a FY 2011 master plan. The extent of any rehabilitation is uncertain until the field work is performed, and any capital needs will be funded under separate line items. Condition evaluation may consist of a combination of ultrasonic testing, coupon extraction, leak detection, and/or other technologies suitable for pressure pipe condition assessment.

Evaluations are scheduled in FY 2026 and FY2028 for the Rangewood, Eubanks, and Countryside force mains.

**Benefits:** replaces or extends useful life of aging assets

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$45,000	\$0	\$45,000	\$90,000
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$0	\$0	\$5,000	\$0	\$5,000	\$10,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$50,000</b>	<b>\$0</b>	<b>\$50,000</b>	<b>\$100,000</b>

**Current Status:** Not yet started

## 277-43 Rogerson Drive Force Main and Pump Station Program Services

### Description/Background:

The 2-mile-long Rogerson Drive force main runs from the wastewater pump station north of Cleland Drive southward across North Carolina Highway 54 (NC 54), to Prestwick Road and then continues to the Mason Farm Wastewater Treatment Plant (WWTP) by crossing UNC's Finley Golf Course. The northern section of the force main, including the crossing under N.C. 54, does not have a parallel line for redundancy, whereas the portion from Prestwick Road nearly to the WWTP site does.

Failure of the pipe at a spot along Prestwick Road in September 2016 led to the cured in place pipe (CIPP) rehabilitation of approximately 700 feet of 24" and 30" force main surrounding that location. Failure of the pipe at a spot along Rogerson Drive in April 2019 led to emergency repair completed in FY 2020 which included approximately 1,300 feet of pipe replacement of 24" and 30" force main. OWASA's previous emergency repair work has addressed the known high-risk sections of the force main.

While several risk studies and capital projects related to the pump station and force main system have been completed since 2013, CIP 277-43 was developed as the long-term facility planning effort for this critical part of the collection system, with the following major objectives:

- Determine the temporal and spatial dynamics of flow through the force main through a range of operating conditions; determine any recommended improvements to operating schemes;
- Determine the likelihood of failure for key portions of the force main, including through the use of appropriate condition assessment technologies;
- Complete the rehabilitation/replacement of high-risk portions of the force main;
- Determine the optimal route for a future redundant force main.

**Benefits:** replaces or extends the life of aging infrastructure

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$90,000	\$0	\$0	\$0	\$0	\$90,000
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$10,000	\$0	\$0	\$0	\$0	\$10,000
<b>TOTAL</b>	<b>\$100,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$100,000</b>

**Current Status:** Condition Assessment completed, Risk Analysis and Determination of Future State for the Rogerson Drive Pump Station and Force Main is planned for FY 2024

## 277-44 Rogerson Drive Pump Station Capacity Upgrade

### Description/Background:

The Rogerson Drive Pump Station is the largest wastewater pump station in the collection system, collecting wastewater flow from about half of the service area. The collection system master plan completed in FY 2020 identified a potential near-term capacity restriction for this pump station based on hydraulic modeling of the system. Funding is included in FY 2027 to begin planning efforts for the capacity project. The efficacy of the gravity sewer rehabilitation programs (CIP [276-18](#) and [376-01](#)) in identifying and reducing sources of inflow and infiltration into the system will directly impact the need and timing of this project.

**Benefits:** meets expected future wastewater demand

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$90,000	\$10,000	\$100,000
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$170,000	\$170,000
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$0	\$0	\$0	\$10,000	\$30,000	\$40,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$100,000</b>	<b>\$200,000</b>	<b>\$300,000</b>

**Current Status:** Not yet started

## 277-45 Chapel Hill North Pump Station Rehabilitation

### Description/Background:

This funding focuses on the rehabilitation of the Chapel Hill North Pump Station to include updated pumps, electrical equipment, and site improvements.

**Benefits:** replaces aging infrastructure; meets expected future wastewater demand

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
Planning	\$0	\$0	\$0	\$0	\$0	\$0
Design/Land	\$0	\$0	\$0	\$0	\$0	\$0
Construction	\$270,000	\$0	\$0	\$0	\$0	\$270,000
Inspection	\$50,000	\$0	\$0	\$0	\$0	\$50,000
Construction Admin	\$50,000	\$0	\$0	\$0	\$0	\$50,000
Contingency	\$30,000	\$0	\$0	\$0	\$0	\$30,000
TOTAL	\$400,000	\$0	\$0	\$0	\$0	\$400,000

**Current Status:** Under construction

## 277-47 Rogerson Drive Fuel Storage Improvements

### Description/Background:

The Rogerson Drive Pump Station currently has two fuel tanks totaling 1,840 gallons of storage for the onsite generator. Based on the Backup Generator Evaluation and Fuel Management Strategy study completed in 2020, the Rogerson Drive Pump Station is recommended to increase its overall fuel storage capacity to 3,600 gallons. This project provides funding for increasing fuel storage at the Rogerson Drive Pump Station to 3,600 gallons to allow for 48-hours of generator run time.

**Benefits:** increases operational efficiency; improves service reliability; improves safety

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
Planning	\$0	\$5,000	\$0	\$0	\$0	\$5,000
Design/Land	\$0	\$50,000	\$0	\$0	\$0	\$50,000
Construction	\$0	\$20,000	\$400,000	\$0	\$0	\$420,000
Inspection	\$0	\$5,000	\$30,000	\$0	\$0	\$35,000
Construction Admin	\$0	\$5,000	\$30,000	\$0	\$0	\$35,000
Contingency	\$0	\$5,000	\$30,000	\$0	\$0	\$45,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$90,000</b>	<b>\$500,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$590,000</b>

**Current Status:** Not yet started

## 277-48 Lake Ellen Pump Station Rehabilitation

### Description/Background:

A Pump Station Operational Assessment completed in January 2020 identified several issues with the Lake Ellen Pump Station. Through this Assessment, pump station components were ranked on a scale of one to five, with one indicating good condition and five indicating imminent signs of failure. This project provides funding for a series of improvements needed at the Lake Ellen Pump Station for components that scored 4 or higher from the assessment including installation of fall protection, and site access improvements.

Pump #1 VFD was replaced in June 2022 and Pump No.2 & No.3 VFDs were replaced in July 2023.

**Benefits:** replaces aging infrastructure, reduces safety risk

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$5,000	\$0	\$5,000
<b>Design/Land</b>	\$0	\$0	\$0	\$50,000	\$0	\$50,000
<b>Construction</b>	\$0	\$0	\$0	\$0	\$200,000	\$200,000
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$15,000	\$15,000
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$15,000	\$15,000
<b>Contingency</b>	\$0	\$0	\$0	\$5,000	\$20,000	\$25,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$60,000</b>	<b>\$250,000</b>	<b>\$310,000</b>

**Current Status:** Not yet started

## 277-49 Eastowne Generator

### Description/Background:

This project provides funding in FY 2024 to support the replacement of a generator at the Eastowne pump station.

**Benefits:** reduces risk, increases resiliency

### Funding:

	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	5-Year Total
Planning	\$0	\$0	\$0	\$0	\$0	\$0
Design/Land	\$0	\$0	\$0	\$0	\$0	\$0
Construction	\$45,000	\$0	\$0	\$0	\$0	\$45,000
Inspection	\$0	\$0	\$0	\$0	\$0	\$0
Construction Admin	\$0	\$0	\$0	\$0	\$0	\$0
Contingency	\$5,000	\$0	\$0	\$0	\$0	\$5,000
TOTAL	\$50,000	\$0	\$0	\$0	\$0	\$50,000

**Current Status:** Generator procurement process underway



## 277-50 Knolls Pump Station Evaluation

### Description/Background:

The Knolls pump station is one of two remaining dual pump dry well stations within OWASA's collection system. Preliminary engineering was completed in FY 2018 to identify options for the Knolls pump station since there are options to upgrade the site or relocate the pump station. This project provides the funding in FY 2026 for the design of the new pump station and construction starting in FY 2027.

**Benefits:** replaces aging infrastructure

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$0	\$0	\$95,000	\$200,000	\$0	\$295,000
<b>Construction</b>	\$0	\$0	\$0	\$30,000	\$500,000	\$530,000
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$25,000	\$25,000
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$25,000	\$25,000
<b>Contingency</b>	\$0	\$0	\$5,000	\$20,000	\$50,000	\$75,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$100,000</b>	<b>\$250,000</b>	<b>\$600,000</b>	<b>\$950,000</b>

**Current Status:** Not yet started

## 277-51 Piney Mountain Force Main Manhole Lining

### Description/Background:

A condition assessment was completed on the Piney Mountain pump station force main in 2022. This study included field investigations and engineering evaluations of the force main and associated air release valve manholes and appurtenances. The recommendations from this study included coating and lining the air release valve (ARV) manhole interiors to prevent degradation from sewer gases and environmental conditions.

This project provides funding for lining the ARV manholes.

**Benefits:** replaces aging infrastructure

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
Planning	\$0	\$0	\$0	\$0	\$0	\$0
Design/Land	\$0	\$0	\$0	\$0	\$0	\$0
Construction	\$15,000	\$0	\$0	\$0	\$0	\$15,000
Inspection	\$0	\$0	\$0	\$0	\$0	\$0
Construction Admin	\$0	\$0	\$0	\$0	\$0	\$0
Contingency	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL	\$15,000	\$0	\$0	\$0	\$0	\$15,000

**Current Status:** Bidding

## 277-52 Force Main ARV Replacements

### Description/Background:

OWASA's collection system consists of 28 air release valves (ARVs). Most of these valves are located within small manholes on force mains and are confined spaces. Many of these ARVs are difficult to access and service and some have reached the end of their useful life and need to be replaced.

This project provides funding to establish a new standard detail and design for ARV installation as well as funding to replace and rehabilitate the identified ARVs.

**Benefits:** replaces aging infrastructure, reduces risk

### Funding:

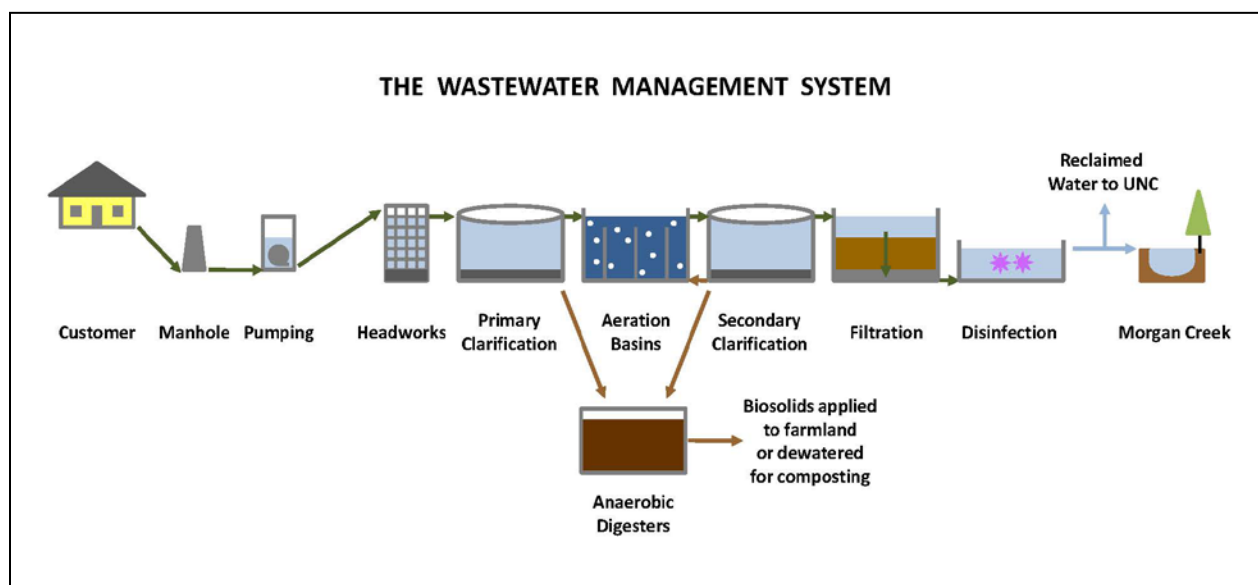
	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$75,000	\$20,000	\$0	\$0	\$0	\$95,000
<b>Construction</b>	\$0	\$280,000	\$0	\$0	\$0	\$280,000
<b>Inspection</b>	\$0	\$10,000	\$0	\$0	\$0	\$10,000
<b>Construction Admin</b>	\$0	\$10,000	\$0	\$0	\$0	\$10,000
<b>Contingency</b>	\$5,000	\$30,000	\$0	\$0	\$0	\$35,000
<b>TOTAL</b>	<b>\$80,000</b>	<b>\$350,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$430,000</b>

**Current Status:** RFQ to be released in early FY 2024

## Category 278/378: Wastewater Treatment and Recycling

### Background

After collection and conveyance from sources throughout the community, wastewater is treated at the Mason Farm Wastewater Treatment Plant (WWTP). A portion of the treated wastewater is reused as reclaimed water (RCW) for non-drinking purposes on the UNC campus and elsewhere, and the remainder is discharged to Morgan Creek, which is a tributary to Jordan Lake. The WWTP employs biological, chemical and physical processes to treat the wastewater. Solids separated from the wastewater are treated and recycled as biosolids. Biosolids are beneficially recycled at multiple agricultural sites in Orange, Alamance and Chatham Counties or sent for composting at a privately-owned facility in Chatham County.



The WWTP is OWASA's largest energy-consuming facility, typically using about half of OWASA's total electrical energy used in any given year. The energy intensity (amount of energy required for every wastewater unit treated) has declined by about 40% since the installation of a fine bubble diffused aeration system, energy efficient blowers and mixers in 2014.

### Existing Facilities

The WWTP is located on Old Mason Farm Road next to UNC's Finley Golf Course. When first placed in service in 1948, the WWTP had a capacity of 2.25 million gallons per day (MGD). Secondary treatment was achieved through one primary clarifier followed by a trickling filter and final clarifier. Solids particles were digested anaerobically. Some of the original facilities are still in service today.

Treatment capacity was increased to 4.5 MGD in 1968 with a doubling of existing facilities. Included in this expansion was the addition of two anaerobic digesters and a centrifuge to dewater the biosolids. Improvements completed in 1978 increased treatment capacity to 5.5 MGD and included the construction of an activated sludge basin for ammonia-nitrogen removal and a chlorine contact chamber for effluent disinfection. A 1983 expansion and renovation project, partially funded through a 201 Wastewater Facilities

Grant from the United States Environmental Protection Agency (US EPA), increased the treatment capacity to 8 MGD. This project included two additional activated sludge basins, major improvements to the aeration equipment, two new final clarifiers, a new chlorine contact chamber, and other major renovations throughout the plant. It also included the acquisition and preparation of the first tract of OWASA-owned land for our biosolids land application program.

Additional improvements were completed in 1991 to meet the state's phosphorus effluent limit, as well as a new limit on the amount of chlorine that could be discharged. Other key improvements included aeration basin tie-ins and an engine-driven air blower system capable of using methane gas produced in the digesters. These improvements and others enabled full time use of a biological phosphorus removal process developed and patented by OWASA.

A 0.9 MG off-site liquid biosolids storage tank was constructed in 1994 on OWASA's Headwaters property, located west of Carrboro, to provide approximately 30 days of biosolids storage capacity. This improvement allowed a re-rating of the plant capacity from 8 to 9 MGD.

An additional 3 MGD of treatment capacity was provided through the FY 2000 expansion and renovation project, thereby increasing the plant's permitted capacity to 12 MGD. This project included construction of a new headworks, Primary Clarifier No. 3, Aeration Basins Nos. 4A and 4B, Secondary Clarifier No. 4, two 250 horsepower (HP) Electric Blowers for the aeration basins, a new Solids Handling Building that included two new Gravity Belt Thickeners, two new boilers, and Anaerobic Digesters Nos. 3 and 4. A 2,000-kilowatt (kW) electrical generator was installed in FY 2001 to improve reliability during power outages. Two 6 MGD diesel powered pumps were installed in 2002 at Intermediate Pump Station No. 2 to provide additional reliability and redundancy.

Another 1.5 MG off-site biosolids storage tank was constructed in FY 2003 to provide adequate biosolids storage capacity needed during extended periods when land application of biosolids was not possible.

The WWTP was upgraded and expanded to a capacity of 14.5 MGD as part of a 3-year, \$50 million construction project completed in 2007. This project provided six new deep-bed denitrification filters, an ultraviolet (UV) disinfection system, new headworks, new influent sewers and influent pump station (Morgan Creek pump station), new Secondary Clarifier No. 5, and major improvements to the aeration basins. In addition, the project converted digester covers from floating to fixed, installed a new digester gas storage system, added chemical storage tanks, and installed a 2,700-kW generator and new switchgear. The denitrification filters will help meet future, more stringent total nitrogen permit limits required by the state's Jordan Lake Nutrient Management Rules. The filters will also enhance our ability to meet the stringent total phosphorus limit as plant flows increase.

Biosolids are processed in a series of four anaerobic digesters and then either recycled in liquid form as a low strength fertilizer and soil amendment via land application to local farmlands or dewatered and transported for composting. The land application sites include both privately-owned sites and one OWASA-owned site. OWASA has both "Class A" and "Class B" permits for the land application of biosolids. A rotary press was installed in 2007 to provide onsite biosolids dewatering to about 20% solids content.

As a result of a FY 2007 odor study, phased projects were recommended to help achieve OWASA's odor control objectives. The first phase was completed in 2007 and included covering and treating foul air from the primary clarifier splitter boxes, the intermediate pump station wetwells, and the aeration basin influent channel. The second phase, completed in FY 2010, covered the primary clarifiers and treated the foul air emanating from them. The third phase (as part of CIP 278-40), completed in FY 2015, covered and treated the air from 10 of the 16 aeration/ nitrified sludge basin cells and included installation of three new odor

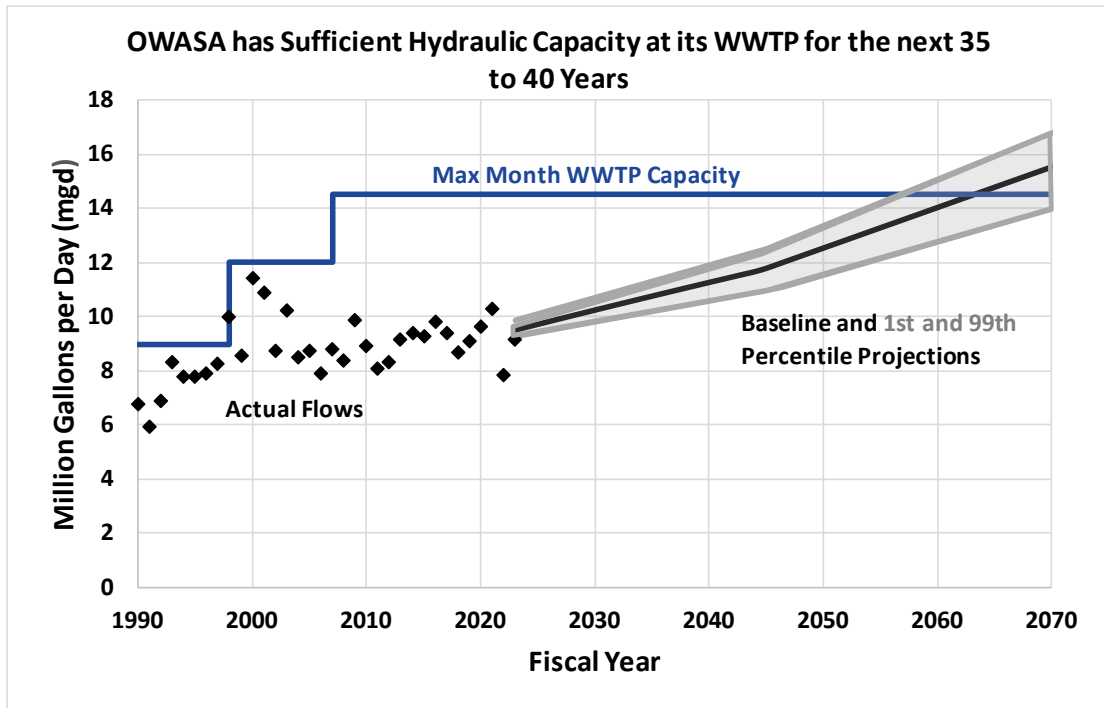
scrubbers. Going forward, odor control will be addressed on a project-by-project basis.

In 2009, RCW facilities (storage tank, pumping, distribution pipe, etc.) were completed and put into service, and an upgrade of the Digester Complex electrical system was completed. Improvements to the existing flood protection system, including work on the berm around the WWTP site, stream bank stabilization to Morgan Creek adjacent to the WWTP berm, and rehabilitation of the existing stormwater pumps were completed in FY 2014.

A 2010 engineering study recommended that to improve treatment process performance, meet more stringent nutrient limits, and reduce energy use and costs, the existing blowers, aeration system, and mixers be replaced with more efficient fine-bubble diffusers, new blowers, and new mixers. As noted above, that project was completed in FY 2015 in conjunction with the third phase of odor control improvements. The new blowers, aeration system, and mixers reduced electricity use at the WWTP by about 40 percent and energy costs by about \$300,000 in 2015.

The 2010 engineering study also recommended certain operational changes for optimizing existing processes as well as other capital improvements to address future capacity limitations. Implementation of several of these operational recommendations resulted in immediate and significant benefits through reduced operating costs and the ability to meet the permit limits for total nitrogen without additional capital facilities, assuming flow conditions associated with the WWTP's permitted capacity of 14.5 MGD. Major capacity expansion of the WWTP is not expected to be required for several decades based on OWASA's current flow projections but the current master plan will inform the next years of improvements needed at the facility.

In 2020 solids handling processes improvements were completed and put into service. The improvements replaced the gravity belt thickeners, which had reached the end of their useful life, to rotary drum thickeners.



### Planned Improvements

The five-year CIP includes \$13.5 million for this asset class. Notable projects include the conversion of Secondary Clarifier #4 ([278-20](#)), Digester #4 condition assessment and improvements and rehabilitation ([278-97](#)), and improvements to all three Primary Clarifiers ([278-86](#)). In addition, a master plan for the facility to be completed over the next fiscal year is expected to inform future capital investment.

### Category 278/378: Wastewater Treatment

		FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Five-Year Total
278-01	WWTP and Pump Station PLC Replacements	\$650,000	\$850,000	\$0	\$0	\$0	<b>\$1,500,000</b>
278-03	WWTP Digester #3 and #4 Stairwell Safety Improvements	\$200,000	\$0	\$0	\$0	\$0	<b>\$200,000</b>
278-15	WWTP Condition Assessments	\$40,000	\$50,000	\$50,000	\$50,000	\$0	<b>\$190,000</b>
278-16	Morgan Creek Pump Station Ventilation, Recoatings, and Improvements	\$25,000	\$0	\$0	\$200,000	\$90,000	<b>\$315,000</b>
278-17	WWTP Aeration Basin Rehab	\$0	\$405,000	\$700,000	\$0	\$0	<b>\$1,105,000</b>
278-18	Intermediate Pump Station #1 Improvements	\$0	\$0	\$372,000	\$0	\$0	<b>\$372,000</b>
278-20	WWTP Clarifier #4 Conversion	\$560,000	\$2,900,000	\$1,000,000	\$0	\$0	<b>\$4,460,000</b>
278-21	WW Primary Influent to IPS Capacity Improvements	\$0	\$0	\$0	\$50,000	\$0	<b>\$50,000</b>
278-75	WWTP Facilities Planning	\$150,000	\$0	\$0	\$0	\$0	<b>\$150,000</b>
278-85	Gas Monitoring at the WWTP	\$280,000	\$0	\$0	\$0	\$0	<b>\$280,000</b>
278-86	WWTP Primary Clarifier Rehabilitation	\$0	0	\$200,000	\$3,010,000	\$0	<b>\$3,210,000</b>
278-89	WWTP RAS Pumping Improvements	\$0	\$150,000	\$250,000	\$0	\$0	<b>\$400,000</b>
278-92	WWTP Stormwater PS to IPS	\$0	\$0	\$0	\$0	\$50,000	<b>\$50,000</b>
278-94	Biogas Removal System Improvements	\$150,000	\$0	\$0	\$0	\$0	<b>\$150,000</b>
278-97	WWTP Digester #3 and #4 Condition Assessment and Repairs	\$400,000	\$100,000	\$0	\$0	\$0	<b>\$500,000</b>
378-01	Future Mason Farm Upgrades for Nutrient Removal	\$0	\$50,000	\$100,000	\$200,000	\$200,000	<b>\$550,000</b>
<b>278/ 378 Category Total</b>		<b>\$2,455,000</b>	<b>\$4,505,000</b>	<b>\$2,672,000</b>	<b>\$3,510,000</b>	<b>\$340,000</b>	<b>\$13,482,000</b>



## 278-01 Wastewater Treatment Plant and Pump Station PLC Replacements

### Description/Background:

A supervisory control and data acquisition (SCADA) master plan was completed in 2021 and identified several programmable logic computers (PLCs) at the Wastewater Treatment Plant and remote pump stations are obsolete and in need of replacement. This project will provide funding and engineering support to replace the identified PLCs in FY 2024 and FY 2025.

**Benefits:** replaces aging assets; increases operational efficiency

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$50,000	\$70,000	\$0	\$0	\$0	\$120,000
<b>Construction</b>	\$560,000	\$720,000	\$0	\$0	\$0	\$1,280,000
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$40,000	\$60,000	\$0	\$0	\$0	\$100,000
<b>TOTAL</b>	<b>\$650,000</b>	<b>\$850,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$1,500,000</b>

**Current Status:** Underway

## 278-03 Digester No.3 and No.4 Stairwell Safety Improvements

### Description/Background:

Recent updates to the National Fire Protection Association (NFPA) 820 and 70 Standards require upgrades to the Digester No. 3 and No. 4 stairwell to include positive pressure, gas monitoring, door alarming and electrical improvements. A study to evaluate required upgrades was completed in FY 2023 and funding is provided in FY 2024 for bidding and construction of the electrical improvements. Additional funding will be needed in future years to address HVAC recommendations.

**Benefits:** reduces safety risk

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$30,000	\$0	\$0	\$0	\$0	\$30,000
<b>Construction</b>	\$140,000	\$0	\$0	\$0	\$0	\$140,000
<b>Inspection</b>	\$5,000	\$0	\$0	\$0	\$0	\$5,000
<b>Construction Admin</b>	\$5,000	\$0	\$0	\$0	\$0	\$5,000
<b>Contingency</b>	\$20,000	\$0	\$0	\$0	\$0	\$20,000
<b>TOTAL</b>	<b>\$200,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$200,000</b>

**Current Status:** Not yet started

## 278-15 Wastewater Condition Assessments

### Description/Background:

This project provides funding from FY 2024 through FY 2027 for the prioritized condition assessment of processes, structures, and pumping systems throughout the Wastewater Facilities. Near term areas in need of condition assessment include the boiler and biogas system, hot water recirculation systems, aeration basins, nitrified sludge basins and system, Secondary Clarifier No. 1 and No. 5, denitrification filters, post-aeration and effluent pump station, and the reclaimed water wet well and pumping system. The WWTP master plan is expected to inform some of the prioritization of the above systems for assessment.

**Benefits:** determines asset risk

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$30,000	\$40,000	\$40,000	\$40,000	\$0	\$150,000
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$10,000	\$10,000	\$10,000	\$10,000	\$0	\$40,000
<b>TOTAL</b>	<b>\$40,000</b>	<b>\$50,000</b>	<b>\$50,000</b>	<b>\$50,000</b>	<b>\$0</b>	<b>\$190,000</b>

**Current Status:** Not yet started

## 278-16 Morgan Creek Pump Station Ventilation, Recoatings, and Improvements

### Description/Background:

The Morgan Creek Pump Station does not have the appropriate air turnover rates to maintain Occupational Safety and Health Administration (OSHA) Class I Division II requirements. As such the station is experiencing corrosion at high rates. The corrosion is affecting all portions of the system, including the fall protection for the hatches. An ongoing study will identify ventilation improvements that would be necessary to improve air turnover and meet requirements. This project provides funding for replacement of the fall protection for each hatch in FY 2024 and then design and installation of the ventilation improvements in FY 2026 followed by the necessary recoatings in FY 2027.

**Benefits:** reduces safety risk, replaces aging assets

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$150,000
<b>Design/Land</b>	\$0	\$0	\$0	\$50,000	\$0	\$0
<b>Construction</b>	\$20,000	\$0	\$0	\$130,000	\$70,000	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$5,000	\$5,000	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$5,000	\$5,000	\$0
<b>Contingency</b>	\$5,000	\$0	\$0	\$10,000	\$10,000	\$40,000
<b>TOTAL</b>	<b>\$25,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$200,000</b>	<b>\$90,000</b>	<b>\$190,000</b>

**Current Status:** Fall protection procurement underway

## 278-17 WWTP Aeration Basin Rehabilitation

### Description/Background:

The aeration basins were originally constructed in 1984. A previous condition assessment identified corrosion of concrete, piping, and valves throughout the basins. The assessment also identified several coating failures. This project provides the funding in FY 2025 and FY 2026 for the necessary repairs to rehabilitate the concrete, piping, valves and coatings as previously identified.

**Benefits:** replaces aging assets

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$0	\$70,000	\$0	\$0	\$0	\$70,000
<b>Construction</b>	\$0	\$300,000	\$540,000	\$0	\$0	\$840,000
<b>Inspection</b>	\$0	\$10,000	\$30,000	\$0	\$0	\$40,000
<b>Construction Admin</b>	\$0	\$10,000	\$30,000	\$0	\$0	\$40,000
<b>Contingency</b>	\$0	\$15,000	\$100,000	\$0	\$0	\$115,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$405,000</b>	<b>\$700,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$1,105,000</b>

**Current Status:** Not yet started

## 278-18 Intermediate Pump Station No.1 Improvements

### Description/Background:

The Intermediate Pump Station (IPS) No. 1 was constructed in 1976. An evaluation on IPS 1 was completed in 2016 that identified that the variable frequency drives (VFDs) and associated electrical system were in poor condition. This project provides the funding in FY 2026 to replace VFDs, replace conduit and control wiring, conduct an arc flash study and improve ventilation.

**Benefits:** replaces aging assets, reduces safety risk

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$0	\$0	\$50,000	\$0	\$0	\$50,000
<b>Construction</b>	\$0	\$0	\$250,000	\$0	\$0	\$250,000
<b>Inspection</b>	\$0	\$0	\$20,000	\$0	\$0	\$20,000
<b>Construction Admin</b>	\$0	\$0	\$20,000	\$0	\$0	\$20,000
<b>Contingency</b>	\$0	\$0	\$32,000	\$0	\$0	\$32,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$372,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$372,000</b>

**Current Status:** Not yet started

## 278-20 WWTP Secondary Clarifier No. 4 Improvements

### Description/Background:

The WWTP has five secondary clarifier units of various capacities, ages, and features. Maintenance of Secondary Clarifier No.4 has been a concern for staff for many years. The inboard effluent launder design has not performed as well as the other 4 clarifiers with exterior launders. This limits the overall operational flexibility of secondary clarification (especially during wet weather flows). This project provides funding for the conversion of Secondary Clarified No.4 to an exterior launder design, along with other improvements.

Preliminary engineering was completed in FY 2019. Detailed design was started in FY 2021 and completed in FY 2022. Construction funds are provided in FY 2024 through FY 2026.

This project has been awarded a State Revolving Fund loan.

**Benefits:** replaces or extends the useful life of aging assets; improves operational flexibility and efficiency

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$20,000	\$0	\$0	\$0	\$0	\$20,000
<b>Construction</b>	\$440,000	\$2,600,000	\$820,000	\$0	\$0	\$3,860,000
<b>Inspection</b>	\$40,000	\$90,000	\$50,000	\$0	\$0	\$180,000
<b>Construction Admin</b>	\$40,000	\$90,000	\$50,000	\$0	\$0	\$180,000
<b>Contingency</b>	\$20,000	\$120,000	\$80,000	\$0	\$0	\$220,000
<b>TOTAL</b>	<b>\$560,000</b>	<b>\$2,900,000</b>	<b>\$1,000,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$4,460,000</b>

**Current Status:** Construction underway

## 278-21 Wastewater Primary Effluent to Intermediate Pump Station Capacity Improvements

### Description/Background:

The effluent from the primary clarifiers flows through a 30-inch effluent line from Splitter Box 2 to the next stages of treatment. A 2010 hydraulic and treatment capacity study completed at the wastewater plant indicated that the primary effluent 30-inch line from Splitter Box 2 is undersized for the 43.5 MGD peak hour flow of the plant and must be diverted through Trickling Filter 2. This project is expected to evaluate the addition of a primary effluent line and the modification of the existing lines to bypass the trickling filters. Funding is provided for a study in FY 2027. This project will be informed by the findings from the Wastewater Treatment Master Plan ([278-75](#)).

**Benefits:** replaces aging assets, increases operational efficiency

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
Planning	\$0	\$0	\$0	\$0	\$0	\$0
Design/Land	\$0	\$0	\$0	\$40,000	\$0	\$40,000
Construction	\$0	\$0	\$0	\$0	\$0	\$0
Inspection	\$0	\$0	\$0	\$0	\$0	\$0
Construction Admin	\$0	\$0	\$0	\$0	\$0	\$0
Contingency	\$0	\$0	\$0	\$10,000	\$0	\$10,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$50,000</b>	<b>\$0</b>	<b>\$50,000</b>

**Current Status:** Not yet started



## 278-75 WWTP Facilities Planning

### Description/Background:

The previous hydraulic and treatment capacity evaluation of the WWTP was completed in 2010 and determined that the next WWTP capacity upgrade to 18.5 million gallons per day (MGD) would cost \$59 million (2010 dollars) but would not be required until 2030.

An updated master plan was begun in FY 2022. Funds are provided in FY 2024 to finish the updated capacity evaluation and facility master plan for the WWTP. The primary purpose of the master plan is to identify near and long-term improvements that will help the WWTP provide reliable and efficient wastewater treatment. The master plan will include a regulatory review, hydraulic capacity assessment, nutrient removal and recovery evaluation, biosolids management evaluation, energy recovery and resiliency assessment, and prioritized condition assessment to identify improvement projects that will optimize performance, reduce resource consumption, accommodate flow and load conditions, and consider regulatory implications and challenges.

**Benefits:** determines asset risk; identifies future capital investment needs

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$130,000	\$0	\$0	\$0	\$0	\$130,000
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$20,000	\$0	\$0	\$0	\$0	\$20,000
<b>TOTAL</b>	<b>\$150,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$150,000</b>

**Current Status:** Master plan is underway

## 278-85 Gas Monitoring at the Wastewater Treatment Plant

### Description/Background:

Gas monitoring systems are needed for the Morgan Creek Pump Station and Old Digester Building to address safety concerns. WWTP staff need to enter these spaces routinely to perform various operational and maintenance duties. Installation of fixed continuous gas monitoring systems will communicate to supervisory control and data acquisition (SCADA) as well as provide local alarms for potentially unsafe conditions. Funding is provided in FY 2024 for installation of these monitors.

**Benefits:** reduces safety risks

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$30,000	\$0	\$0	\$0	\$0	\$30,000
<b>Construction</b>	\$220,000	\$0	\$0	\$0	\$0	\$220,000
<b>Inspection</b>	\$5,000	\$0	\$0	\$0	\$0	\$5,000
<b>Construction Admin</b>	\$5,000	\$0	\$0	\$0	\$0	\$5,000
<b>Contingency</b>	\$20,000	\$0	\$0	\$0	\$0	\$20,000
<b>TOTAL</b>	<b>\$280,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$280,000</b>

**Current Status:** Procurement underway

## 278-86 WWTP Primary Clarifier Rehabilitation

### Description/Background:

The WWTP has three primary clarifiers and two flow distribution boxes, all of which were covered between 2007 and 2009. Corrosion of several internal components has been accelerated due to covering of the clarifiers and inadequate foul air removal by the odor scrubber systems. Due to this corrosion, concrete rehabilitation is needed in the primary influent and effluent flow distribution boxes and the effluent troughs of Primary Clarifiers Nos. 1 and 2. These two clarifiers also require rehabilitation or replacement of internal rake arms. In addition, the scum pump stations for all three clarifiers are in need of rehabilitation to address electrical safety concerns and improved pumping.

Solids from the primary clarifiers are pumped via pumps located in the basement of the Old Lab Building. A study completed in FY 2018 found that construction of a new pump station was preferable due to the high cost of rehabilitating the existing equipment and structure. The new facility will provide improved access for operations and maintenance, improved redundancy, and better pumping performance. The priority, design and location of the new facility will be coordinated with findings from [CIP 278-75 WWTP Facilities Planning](#).

Funding is provided in FY 2026 and FY 2027 for design and construction of these improvements.

**Benefits:** reduces operational risk; replaces aging assets; reduces safety risk

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$0	\$0	\$190,000	\$0	\$0	\$190,000
<b>Construction</b>	\$0	\$0	\$0	\$2,486,000	\$0	\$2,486,000
<b>Inspection</b>	\$0	\$0	\$0	\$125,000	\$0	\$125,000
<b>Construction Admin</b>	\$0	\$0	\$0	\$125,000	\$0	\$125,000
<b>Contingency</b>	\$0	\$0	\$10,000	\$274,000	\$0	\$284,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$200,000</b>	<b>\$3,010,000</b>	<b>\$0</b>	<b>\$3,440,000</b>

**Current Status:** Not yet started

## 278-89 WWTP Return Activated Sludge (RAS) Pumping Improvements

### Description/Background:

A FY 2018 evaluation of the WWTP RAS pumping system made several recommendations to improve the reliability of the system:

- Installation of piping to allow for rapid connection of a backup diesel pump (to be purchased through a future Capital Equipment budget)
- Installation of new RAS piping between Clarifier Nos. 2 and 3 and the nitrified sludge (NSL) tanks

Funds are included in FY 2025 and FY 2026 for completion of the recommended improvements.

**Benefits:** increases operational efficiency and redundancy

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$0	\$134,000	\$0	\$0	\$0	\$134,000
<b>Construction</b>	\$0	\$0	\$215,000	\$0	\$0	\$215,000
<b>Inspection</b>	\$0	\$0	\$11,000	\$0	\$0	\$11,000
<b>Construction Admin</b>	\$0	\$0	\$11,000	\$0	\$0	\$11,000
<b>Contingency</b>	\$0	\$16,000	\$13,000	\$0	\$0	\$29,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$150,000</b>	<b>\$250,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$400,000</b>

**Current Status:** Not yet started

## 278-92 WWTP Stormwater Pump Station Bypass to Intermediate Pump Station

### Description/Background:

Wastewater and chemical spills are contained within the stormwater pump station wet well at the WWTP. During any spill event, stormwater cannot be discharged into surface waters and must be pumped out using a portable pump or vacuum truck and directed back into the process flow of the WWTP. This project provides funding to install a piped connection from the stormwater wet well into the IPS station to facilitate returning stormwater wet well contents back into the process flow. This project will include appropriate siting of the piping as well as installation of valves and SCADA communication. FY 2028 funding is provided to start the design for the piping connection.

**Benefits:** improves operational efficiency; reduces safety risk

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$45,000	\$45,000
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$0	\$0	\$0	\$0	\$5,000	\$5,000
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$50,000</b>	<b>\$50,000</b>

**Current Status:** Not yet started

## 278-94 Biogas Removal System Improvements

### Description/Background:

Biogas is produced during the anaerobic digestion of organic materials within the digesters and fermenter at the WWTP. The biogas removal system is comprised of gas lines and valves to remove the produced gas from the treatment process. The biogas can be utilized by boilers to heat the digesters or excess gas can be burned via a torch. This project provides funding in FY 2024 to install a previously procured redundant torch, gas lines and control system. Additionally, this project funds the rehabilitation of the existing torch, gas lines and controls.

**Benefits:** increases operational efficiency; increases operational resiliency; ensures reduced use of natural gas

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction</b>	\$120,000	\$0	\$0	\$0	\$0	\$120,000
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$30,000	\$0	\$0	\$0	\$0	\$30,000
<b>TOTAL</b>	<b>\$150,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$150,000</b>

**Current Status:** Equipment purchased. Installation and repairs to be solicited in FY 2024

## 278-97 Digester No.3 and No.4 Condition Assessment

### Description/Background:

Thickened waste activated sludge and fermented primary sludge are pumped into digesters where they undergo temperature phased anaerobic digestion to produce Class A biosolids. The four digesters are arranged in series with the biosolids passing through three digesters operated at thermophilic temperatures, followed by one digester operated at mesophilic temperatures.

This funding covers the condition assessment for Digesters No. 3 and 4. This project will address draining and cleaning, condition assessment, and valve replacement on Digesters No. 3 and 4. The condition assessment will further inform the appropriate steps on the mixing system.

In FY 2022, Digester No. 3 experienced a roof failure, and the work was accelerated. In FY 2023 cleanout and coating of Digester No. 3 was completed. Funds are provided in FY 2024 and FY 2025 for additional cleanout and assessment work with Digester No. 4.

**Benefits:** determines asset risk

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$50,000	\$10,000	\$0	\$0	\$0	\$60,000
<b>Construction</b>	\$310,000	\$60,000	\$0	\$0	\$0	\$370,000
<b>Inspection</b>	\$10,000	\$10,000	\$0	\$0	\$0	\$20,000
<b>Construction Admin</b>	\$10,000	\$10,000	\$0	\$0	\$0	\$20,000
<b>Contingency</b>	\$20,000	\$10,000	\$0	\$0	\$0	\$30,000
<b>TOTAL</b>	<b>\$400,000</b>	<b>\$100,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$500,000</b>

**Current Status:** Cleanout of Digester 4 pending

### 378-01 Future Mason Farm Upgrades for Nutrient Removal

**Description/Background:**

This project provides placeholder funding to address expected near-term capital work required to continue to meet nutrient discharge limits. The project scope will be refined once the Wastewater Treatment Plant master plan is complete in FY 2024.

**Benefits:** regulatory compliance

**Funding:**

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
Planning	\$0	\$40,000	\$0	\$0	\$0	\$40,000
Design/Land	\$0	\$0	\$90,000	\$180,000	\$180,000	\$450,000
Construction	\$0	\$0	\$0	\$0	\$0	\$0
Inspection	\$0	\$0	\$0	\$0	\$0	\$0
Construction Admin	\$0	\$0	\$0	\$0	\$0	\$0
Contingency	\$0	\$10,000	\$10,000	\$20,000	\$20,000	\$60,000
TOTAL	\$0	\$50,000	\$100,000	\$200,000	\$200,000	\$500,000

**Current Status:** Not yet started



## Category 279: Reclaimed Water

### **Background**

In April 2009, OWASA began operating a reclaimed water (RCW) system that provides non-drinking water for certain uses that were previously met with drinking water. RCW is the highly treated water produced through advanced treatment at the Wastewater Treatment Plant (WWTP). Disinfection is provided by ultraviolet light and chlorine.

Among other benefits, the RCW system:

- enables OWASA to meet non-drinking water needs in a cost-effective manner while freeing up the community's drinking water supply and treatment capacities to meet essential needs;
- lowers the risk of a water shortage for all customers during drought conditions;
- defers or eliminates the need for costly water supply and/or treatment facilities; and
- requires about 35% less energy per 1,000 gallons of water supplied compared to our drinking water system.



Reclaimed Water System

Following the record drought of 2001-2002, OWASA and the University of North Carolina at Chapel Hill (UNC) partnered to develop the RCW system to meet certain non-drinking water demands on campus. In April 2006, OWASA and UNC entered into a contract in which UNC agreed to pay the entire cost of building the RCW system, and OWASA agreed to operate and maintain the system. Capital and operating costs for the RCW system are paid for solely by OWASA's RCW customers, rather than by the entire customer base.

OWASA received \$1.6 million in grant funds from the North Carolina Clean Water Management Trust Fund to pay for engineering design and permitting costs and a \$625,500 grant from the U.S. Environmental Protection Agency to help pay for construction of the RCW pump station and storage tank. The system was completed in 2009 at a cost of about \$14 million.

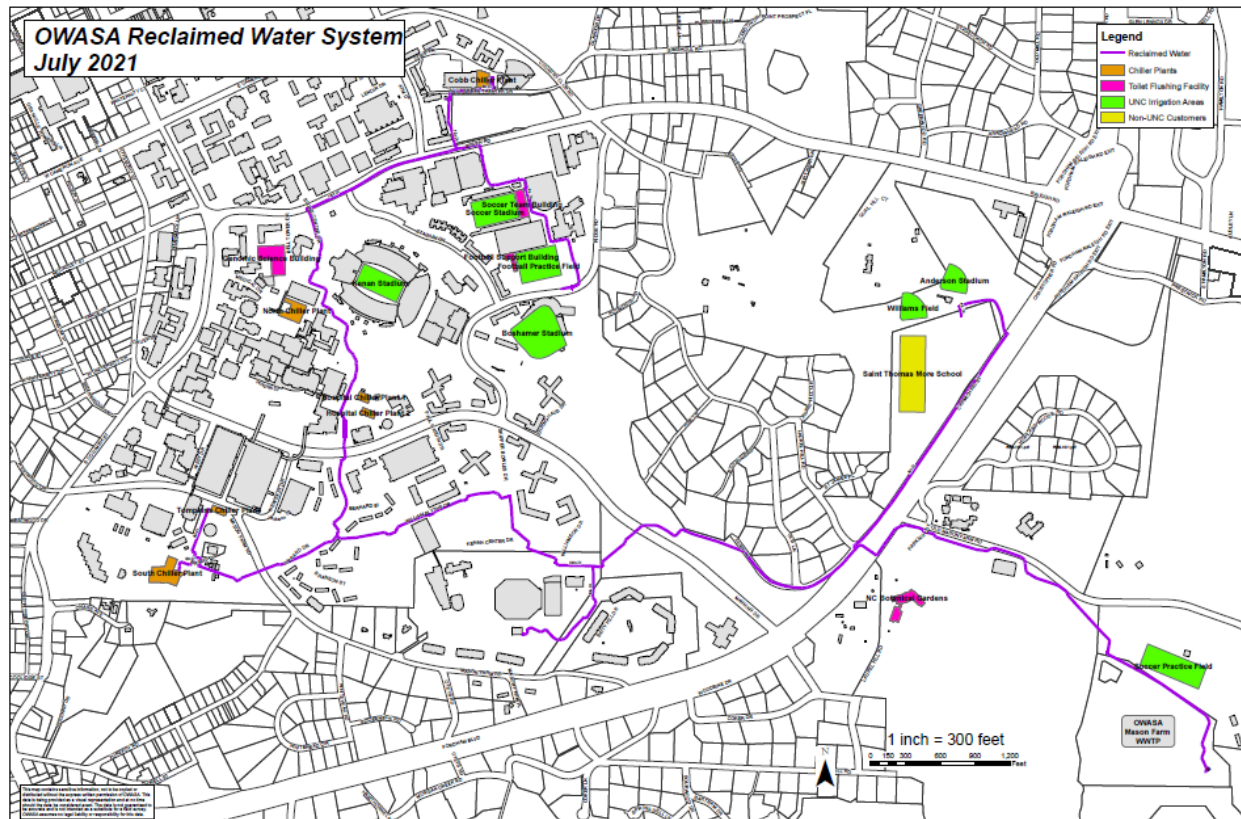
RCW is used by UNC and UNC Hospitals as make-up water for the cooling towers at the five major chilled water plants on the main campus. It is also used for irrigating athletic fields and for toilet flushing at the Genomic Sciences Building and N.C. Botanical Gardens Visitor Education Center. In 2011, OWASA began providing RCW to a nearby private customer (St. Thomas More School) for irrigating an all-purpose athletic field and toilet flushing.

In 2023, eight flanged coupling adapters throughout the reclaimed water distribution system were replaced.

### **Existing Facilities**

The RCW system consists of a 600,000-gallon RCW storage tank and pumping station at the WWTP, a bulk-fill facility for loading RCW into tank trucks, and about five miles of RCW pipe ranging in size from 6 to 24 inches in diameter.

The RCW system currently is configured to meet a total peak day demand of 3 million gallons per day (MGD). The system was designed and constructed to allow for cost-effective expansion to about 5 MGD in the future. Average RCW demand in FY 2023 was 0.6 MGD. The system's current configuration will meet projected RCW demands for the foreseeable future.



### Planned Improvements

The CIP includes a water quality evaluation of the reclaimed water to better understand potential degradation risks.

### Category 279: Reclaimed Water

		FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Five-Year Total
279-14	Reclaimed Water - Water Quality Evaluation	\$75,000	\$0	\$0	\$0	\$0	<b>\$75,000</b>
279-15	Reclaimed Water Recap	\$0	\$0	\$0	\$80,000	\$80,000	<b>\$160,000</b>
<b>279</b>	<b>Category Total</b>	<b>\$75,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$80,000</b>	<b>\$80,000</b>	<b>\$235,000</b>

## 279-14 Reclaimed Water – Water Quality Evaluation

### Description/Background:

This project provides the funding to perform a study on the incoming wastewater to assess the sources of conductivity within the collection system and assess if there are meaningful opportunities to reduce conductivity levels in the system and throughout the wastewater treatment process. This project will also assess the impacts from the concentrated blowdown discharges at the UNC Chiller Plants during the summer months and assess the benefits of adding a corrosion inhibitor to the reclaimed water system.

**Benefits:** increases operational efficiency

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$70,000	\$0	\$0	\$0	\$0	\$70,000
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$5,000	\$0	\$0	\$0	\$0	\$5,000
<b>TOTAL</b>	<b>\$75,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$75,000</b>

**Current Status:** Not yet started, RFQ to be released in early FY 2024

## 279-15 Reclaimed Water Recapitalization

### Description/Background:

This project provides funding for replacement, rehabilitation, or improvement of components of the reclaimed water system in order to maintain reliable, efficient performance. Funding is provided in the fourth and fifth fiscal years of any given five-year CIP to assure that capital investment decisions account for some rate of asset replacement in future years where specific projects are not yet identified. This placeholder funding is the primary mechanism used to gauge infrastructure replacement needs not only over the five-year CIP, but over a fifteen-year financial planning horizon. The funding totals are adjusted to account for rehabilitation projects funded elsewhere in this category (279 – Reclaimed Water).

**Benefits:** renews or extends the useful life of aging assets

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$80,000	\$80,000	\$160,000
<b>Design/Land</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Inspection</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Construction Admin</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Contingency</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$80,000</b>	<b>\$80,000</b>	<b>\$160,000</b>

**Current Status:** Long-term funding to be allocated to future identified projects

## Category 280: Central Office and Operations

### Background

OWASA employs approximately 140 people. The majority work at the Jones Ferry Road Administration Building and the Operations Center. A safe, functionally efficient workplace is vital to maintaining high employee productivity; top notch customer service; the ability to store essential vehicles, equipment and materials; and maintenance of critical infrastructure.



Jones Ferry Road Administration Building

### Existing Facilities

OWASA's administrative offices, warehouse, and storage facilities are located at the 17-acre site on Jones Ferry Road in Carrboro. The Administration Building, completed in 1990, is about 22,300 square feet (SF) in size and includes a large general-purpose room for public use by community groups. The 36,000 SF Operations Center, which was completed in FY 2004, houses the Water Distribution and Wastewater Collection Department, warehouse operations, fleet maintenance, material and equipment storage, and a vehicle wash facility.

### Recent Improvements

Renovations to the Administration Building completed in FY 2005 included reconfiguring into office space the areas vacated by the Water Distribution and Wastewater Collection Department, including the warehouse, after it was relocated to the Operations Center. This increased the amount of finished office space in the Administration Building from 19,900 to 22,300 SF and provided a new roof, repaired the exterior facade and exterior canopy on the employee entrance, and relocated the rear entrance. The Administration Building's new HVAC system was commissioned in 2019. In FY 2023, additional offices were created in the Human Resources and Safety, Information Technology, and Engineering and Planning Departments as part of an office renovation project.

### Planned Improvements

The CIP includes a Facility funding line item which is further detailed on the following page.

## Category 280: Central Office and Operations

		FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Five-Year Total
280-19	Admin Building IT Server Room HVAC	\$ 150,000	\$0	\$0	\$0	\$0	\$ 150,000
280-Various	Facility 15 Year CIP Requests	\$1,000,000	\$1,500,000	\$500,000	\$1,000,000	\$1,000,000	\$5,000,000
280	Category Total	\$1,150,000	\$1,500,000	\$500,000	\$1,000,000	\$1,000,000	\$5,150,000

## 280-19 Admin Building IT Server Room HVAC

### Description/Background:

This project provides funding to replace the 5-ton HVAC unit that has experienced failures in the server room that supports OWASA operations. Funding in FY 2024 is provided for equipment procurement and installation. Procurement was started in FY 2023 but due to long lead times, construction will not occur until FY 2024.

**Benefits:** replaces or extends useful life of aging assets, potentially reduces energy use

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
Planning	\$0	\$0	\$0	\$0	\$0	\$0
Design/Land	\$0	\$0	\$0	\$0	\$0	\$0
Construction	\$120,000	\$0	\$0	\$0	\$0	\$120,000
Inspection	\$10,000	\$0	\$0	\$0	\$0	\$10,000
Construction Admin	\$10,000	\$0	\$0	\$0	\$0	\$10,000
Contingency	\$10,000	\$0	\$0	\$0	\$0	\$10,000
TOTAL	\$150,000	\$0	\$0	\$0	\$0	\$150,000

**Current Status:** Equipment Procurement

## 280-Various Facilities Rehabilitation

### Description/Background:

This project provides funding for important facilities work across all of OWASA's asset classes. The funding in this line item will be distributed to a variety of projects every fiscal year.

Near term upcoming projects (and their anticipated FY) for this line item include the following:

- WWTP former UNC Lab Building Demolition – FY24
- WWTP Warehouse Construction – FY25
- Calvander Booster Pump Station Site Modifications – FY24
- Operations Center Entry Renovation – FY24
- Operations Center Vehicle Bay Heating – FY25
- Administration Building EIFS and Stucco Repairs – FY24
- Administration Building Human Resources Entrance Exterior Stair Rehabilitation – FY24
- Cane Creek Reservoir Roof Replacement – Office and residence, restrooms, and maintenance buildings – FY25
- University Lake Boat Dock Replacement – FY25
- Jones Ferry Road Campus Perimeter Fencing Improvements – FY24
- WTP Library Conference room and Mail Room Merger – FY 25
- WTP Additional Office Construction – FY25
- Cane Creek Wood Guardrail Replacement – FY25
- Distribution and Collection Warehouse Study – FY25

**Benefits:** various

### Funding:

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	5-Year Total
<b>Planning</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Design/Land</b>	\$100,000	\$200,000	\$60,000	\$100,000	\$100,000	\$560,000
<b>Construction</b>	\$700,000	\$1,200,000	\$300,000	\$700,000	\$700,000	\$3,600,000
<b>Inspection</b>	\$50,000	\$80,000	\$20,000	\$50,000	\$50,000	\$250,000
<b>Construction Admin</b>	\$50,000	\$80,000	\$20,000	\$50,000	\$50,000	\$250,000
<b>Contingency</b>	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$500,000
<b>TOTAL</b>	<b>\$1,000,000</b>	<b>\$1,500,000</b>	<b>\$500,000</b>	<b>\$1,000,000</b>	<b>\$1,000,000</b>	<b>\$5,160,000</b>

**Current Status:** Long-term funding to be allocated to future identified projects

## Abbreviations

AC	Asbestos Cement	MLSS	Mixed Liquor Suspended Solids
BG	Billion Gallons	MSL	Mean Sea Level
CI	Cast Iron	NCDOT	North Carolina Department of Transportation
CIB	Capital Improvements Budget	NCWRC	North Carolina Wildlife Resource Commission
CIP	Capital Improvements Program	NFPA	National Fire Protection Association
DI	Ductile Iron	NPW	Non-potable Water
FCA	Flanged Coupling Adapters	NSL	Nitrified Sludge
FY	Fiscal Year	O&M	Operations and Maintenance
GHG	Greenhouse Gas	OWASA	Orange Water and Sewer Authority
GIS	Geographic Information System	PLC	Programmable Logic Controller
gpm	gallons per minute	PV	Photovoltaic
HVAC	Heating, Venting, and Air Conditioning	PVC	Polyvinyl Chloride
IPS	Intermediate Pump Station	RAS	Return Activated Sludge
JLP	Jordan Lake Partnership	RCW	Reclaimed Water
kW	Kilowatt	RFQ	Request for Qualifications
LRWSP	Long Range Water Supply Plan	RDT	Rotary Drum Thickeners
MGD	Million gallons per day	SCADA	Supervisory Control and Data Acquisition



SCVFA	Short-Chain Volatile Fatty Acids	VFD	Variable frequency drive
SF	Square Feet	WIP	Western Intake Partnership
UNC	University of North Carolina	WTP	Jones Ferry Water Treatment Plant
UV	Ultraviolet	WWTP	Mason Farm Wastewater Treatment Plant