ARCADIS Design & Consultancy for natural and built assets

City of Albany, New York
Water and Sewer System

FIVE YEAR CAPITAL IMPROVEMENT PROGRAM (2025-2029)

Prepared for:
Albany Water Board and Albany Municipal Water Finance Authority

Albany, NY

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CONTENTS

TABLES

PHOTOS

APPENDICES

EXECUTIVE SUMMARY

The Albany Water Board (AWB) and Albany Municipal Finance Authority (Authority) project a Five-Year Capital Improvement Program (CIP) annually for the water and wastewater system (System), which is comprised of water treatment, transmission, and distribution assets, as well as wastewater collection, conveyance, and satellite treatment facilities. The Authority is also required to complete an examination of the system every other fiscal year in accordance with the Water and Sewer System General Revenue Bond Resolution, adopted by the Authority on January 22, 1998. This report presents the proposed CIP for the periods 2025-2029.

An assessment of the AWB assets was completed based on visual inspections and interviews with AWB personnel regarding previous maintenance, inspection and/or performance records. The assessment was performed on the following assets:

- Supply Reservoirs (Basic Creek and Alcove)
- Six-mile Reservoir (Rensselaer Lake)
- Feura Bush Filtration Plant
- Loudonville Reservoir
- Treated Water Pump Stations
- Elevated Storage Tanks
- Sewer Pump Stations (Representative sample of the 30 stations)
- Albany Water Department Office - (10 North Enterprise Drive and 35 Erie Boulevard)
- Supply and Distribution System
- Collection System

The intent of this system examination is to provide a planning level evaluation of the system, not to provide a detailed assessment of each asset. The recommendations from this evaluation include the need for more detailed assessment of certain assets that are either buried, are too numerous to evaluate under this assignment, and\or if there is insufficient historic data on the condition of the assets.

Project descriptions and capital cost estimates provided by the AWB are incorporated into the CIP. The amount budgeted for 2025 is approximately 33 million, which includes both water and sewer. This work will be undertaken using reserve funds, grant funds, Environmental Facilities Corporation (EFC) financing, and through bond funds.

Water System

The water system for the City of Albany consists of two supply reservoirs with a combined capacity of 13.8 billion gallons; a 48-inch diameter raw water system conduit, 8.3 miles in length; a filtration plant with a design capacity of 32 MGD; a treated water supply conduit, 48 inches in diameter and 11.1 miles long; a distribution system containing approximately 370 miles of pipe of various diameters; and treated water

storage facilities consisting of an open reservoir and two elevated storage tanks, an underground storage tank and a standpipe charged by pump stations.

Major conclusions with respect to the water system are as follows:

- All major elements of the water system are in generally adequate condition.
- The quality of treated water has consistently complied with regulatory standards.
- The capacity of the water system is projected to exceed the demand of the service area through the year 2029.
- The AWB has historically provided adequate service at staffing levels equivalent to those currently in effect.
- Timely completion of the capital improvement program, along with adequate maintenance, should be sufficient to maintain the present level of service provided by the water system for the next five years.

Recommendations for repairs and upgrades were provided based on observations made by Arcadis and discussions with the Albany Department of Water and Water Supply (AWD) staff. A summary of the condition of assets and recommendations for repairs or upgrades are provided in the text. Appendix A, Five Year Capital Improvement Program (2025-2029) Summary of Costs, lists the anticipated projects and project costs. The scope of work for these projects may not be fully defined so the costs shown may change during the five-year period. In addition, if costs for projects are higher than anticipated, some projects may not be included or completed within the five-year period.

Sewer System

The sewer system consists of a network of sewers and sewage pump stations that receive approximately 25 MGD of sewage per day from the City for conveyance to two treatment facilities owned and operated by the Albany County Water Purification District (ACWPD).

The sewer system includes approximately 900 miles of sanitary, storm, and combined sewers; 30 sewage pump stations; and 22 overflow regulators which carry excess flow from combined sewers to 11 discharge points. The system is divided into eight districts and lies entirely within City limits.

Major conclusions with respect to the sewer system are as follows:

- All major elements of the sewer system are generally in adequate condition.
- The sewer system should be capable of handling anticipated sanitary sewage flows through the year 2029.
- Timely completion of the capital improvements program, along with adequate maintenance, should be sufficient to maintain the present level of service provided by the sewer system for the next five years.

Recommendations for repairs and upgrades were provided based on observations made by Arcadis and discussions with AWD staff. A summary of the condition of assets and recommendations for repairs or upgrades are provided in the text. Appendix A, Five Year Capital Improvement Program (2025-2029) Summary of Costs, lists the anticipated projects and project costs. The scope of work for these projects

may not be fully defined so the costs shown may change during the five-year period. In addition, if costs for projects are higher than anticipated, some projects may not be included or completed within the five-year period.

1 BACKGROUND

The Albany Water Board (AWB) and Albany Municipal Finance Authority (Authority) project a Five-Year Capital Improvement Program (CIP) annually for the water and wastewater system (System), which is comprised of water treatment, transmission, and distribution assets, as well as wastewater collection, conveyance and satellite treatment facilities. This report presents the proposed CIP for the periods 2025-2029. Timely completion of the CIP, in conjunction with adequate system maintenance, should be sufficient to maintain the present level of service for the next five years.

The Authority is also required to complete an examination of the system every other fiscal year in accordance with the Water and Sewer System General Revenue Bond Resolution, adopted by the Authority on January 22, 1998, and subsequent resolutions and amendments, as described below.

In every other Fiscal Year, the Consulting Engineer shall make an examination of and shall report to the Authority, the Board, the City and the Trustee on, the properties and operations of the System. Such reports shall set forth among other findings: the Consulting Engineer's advice and recommendations as to the proper operation, maintenance and repair of the System during the two ensuing Fiscal Years and improvements which should be made during the ensuing five Years, and an estimate of the amounts of money necessary for such purposes, the Consulting Engineers findings as to whether the System has been maintained in good repair and sound operating condition, and its estimate of the amount, if any, required to be expended to place such properties in such condition, and the details of such expenditures and the approximate time required therefor.

An assessment of the AWB assets was completed based on visual inspections and interviews with AWD personnel regarding previous maintenance, inspection and/or performance records. The assessment was performed on the following assets:

- Supply Reservoirs (Basic Creek and Alcove)
- Feura Bush Filtration Plant
- Loudonville Reservoir
- Six-mile Reservoir (Rensselaer Lake)
- Treated Water Pump Stations
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- Supply and Distribution System
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The intent of this system examination is to provide a planning level evaluation of the system, not to provide a detailed assessment of each asset. The recommendations from this evaluation include the

need for more detailed assessment of certain assets that are either buried, are too numerous to evaluate under this assignment, and\or if there is insufficient historic data on the condition of the assets.

Project descriptions and capital cost estimates provided by the AWB are incorporated into the CIP. The amount budgeted for 2025 is approximately 33 million, which includes both water and sewer. This work will be undertaken using reserve funds, grant funds, funding through the Clean Water State Revolving Fund, the Drinking Water State Revolving Fund, and through bond funds.

AWB continues to aggressively apply for grants and low to zero interest financing for these projects. Examples of grants that are being utilized include the New York State Department of Environmental Conservation (NYSDEC) Water Quality Improvement Project (WQIP) grant, and grants offered by Environmental Facilities Corporation (EFC), like the Wastewater Infrastructure Engineering Planning Grant (EPG), Water Infrastructure Improvement Act (WIIA), the Green Innovation Grant Program (GIGP), and the Intermunicipal Grant (IMG). The AWB is also utilizing funding from the more recently available Bipartisan Infrastructure Law (BIL) and American Rescue Plan Act (ARPA).

A complete list of AWB grants and financing is provided in Appendix A.

Asset Management Plan

In 2015, AWB developed an Asset Management work plan for the water and sewer system, and an Asset Management Plan in 2017. The development of these plans assists the AWB prioritize and implement asset management elements into its operations. Recommendations included the need to inventory assets and perform condition assessments of infrastructure to support the next steps of the asset management program. Elements of the Plan that require funding from the Capital Budget have been included in this CIP and will be updated annually. A status update is provided in a separate section following the CIP.

Summary of Completed Engineering Reports (2024)

This CIP briefly discusses the work completed in 2024, but Appendix B lists the engineering plans, reports, and designs completed so the reader will know where to obtain additional information.

Environmental Protection Agency (EPA) Audit (2022)

On May 16-19, 2022, the EPA, New York State Department of Health, and Albany County Department of Health conducted a routine inspection of the City of Albany Public Water System. Albany received a report from the EPA on July 15, 2022, noting what they categorize as significant deficiencies, areas of concern, and potential areas of non-compliance found during their inspection.

The non-compliance items were with regard to the way the AWD collects and reports water quality data. Many of the significant deficiencies and areas of concern were identified in and around tanks, including at the clearwell and the open wash water tank at the Feura Bush Filtration Plant and the OGS Harriman Office Campus Ground Storage Tank. This included observed corrosion on piping and beams, sediment build up, insufficient screening for animals and insects, and a broken air vent head on Filter 8. Inspectors also observed that the sodium hypochlorite tanks at the Pine Bush Booster Station are single walled and lack secondary containment.

AWD provides ultraviolet (UV) and chlorination treatment to the effluent of the Loudonville reservoir. The EPA indicated they have not been able to evaluate if the treatment provided meets the microbial

inactivation and/or removal requirements and has requested additional information on UV operating conditions. EPA also determined the AWD is in non-compliance with the way water quality data is collected and reported.

The AWD completed some of the repairs in 2022 and provided to the EPA an Action Plan for completing the remaining repairs on August 29, 2022. On October 24, 2022, Albany received a follow-up letter from the EPA acknowledging the work that was completed and the repair Action Plan submitted. However, the EPA sent a second letter on October 24, 2022, with an Administrative Order, Notice of Violation and Request for Information. A third letter was sent by the EPA on March 21, 2023, with an updated Administrative Order and an enforceable schedule to correct the violations. The AWD completed the remaining repairs required by the EPA in 2023, and August 21,2023, the EPA acknowledged that the AWD had corrected the significant deficiencies noted in the Administrative Order and noted that no further reporting on the order was required.

Improvements have been made to the Upper Service Tank overflow pipe, the clearwell hatch seals, and the Filter 8 air vent. The sodium hypochlorite tanks at the Pine Bush Booster Station have been replaced with double walled tanks. New UV equipment has been installed and is operating at the Loudonville Reservoir, and all reports have been submitted to the NYSDOH and EPA.

2 ALBANY WATER SYSTEM

The Water System's source of supply is obtained from the waters of the Hannacrois and Basic Creeks, located approximately 20 miles southwest of the City in the Heldeberg Mountains. A retention dam was built across the Hannacrois Creek near the Hamlet of Alcove which stores the water of this creek and forms the Alcove Reservoir. The Alcove Reservoir is the main supply reservoir for the Water System. Located in the Town of Coeymans, the Alcove Reservoir contains 13.5 billion gallons of water, of which approximately 12.1 billion gallons are considered available for use. The safe-yield (i.e., long-term safe withdrawal) of the Alcove-Basic Reservoir System is estimated to be 30.5 million gallons per day ("MGD"), and the Alcove Reservoir alone has a safe yield of 24.2 MGD.

Water is carried from the Alcove Reservoir by a 48-inch diameter cast iron pipe (the "Supply Conduit") to a filtration plant located in the Town of Bethlehem, approximately half-way between the Alcove Reservoir and the City water distribution system. The filtration plant is a conventional treatment plant with aeration, hydraulic flocculation, sedimentation, rapid sand filtration and disinfection. Chemicals currently used in the process include sodium hypochlorite, polyaluminum chloride, sodium permanganate, and hydrated lime. In 2018, gas chlorination was replaced with sodium hypochlorite and sodium permanganate addition was relocated to the Alcove Reservoir. The rated plant capacity is 32 MGD.

The water supplied from the Alcove Reservoir is delivered to the City entirely by gravity through the Supply Conduit. The Supply Conduit, constructed in 1930-1932, is approximately 20 miles long and traverses the Towns of Coeymans and Bethlehem, from the Alcove Reservoir to the Loudonville Reservoir. Water is transmitted by the Supply Conduit to the filtration plant and subsequently, to the City and the Loudonville Reservoir. The Supply Conduit is equipped with air release valves at the highpoints and blow-off valves at the low points, which facilitates draining and filling operations.

The Loudonville Reservoir serves as both distribution, storage and back-up supply. The Loudonville system consists of three concrete lined basins with a total capacity of 211 million gallons, representing approximately 7-days of water supply to the City during an emergency or planned outage, one requiring shutdown of the Feura Bush filtration plant or the shutdown of the Supply Conduit.

The storage basins are uncovered. An ultraviolet disinfection system was first installed in 2003, and new equipment was installed in 2023-2024. The facility has four 10 MGD units. Unit 1 has been replaced, Unit 2 is currently being replaced and the other two will be replaced in 2024. The finished water is chlorinated prior to entering the distribution system reservoir, in accordance with New York State Department of Health requirements. Viricidal disinfection with chlorine is accomplished prior to ultraviolet treatment.

Interconnections to the Town of Colonie have capacity of approximately 10 MGD. These interconnections, at Loudonville reservoir and New Karner Road, are for emergency use for supply to either municipality under an intermunicipal agreement.

2.1 Service Areas

The majority of the City is served as one pressure zone from the Loudonville Reservoir. The downtown portion, which is at a lower elevation along the Hudson River, is served through pressure reducing valves. The western portion of the City beyond Fuller Road is served by the Pine Bush Pump Station and the

Pine Bush Tank (1,000,000 gallons). Properties in the vicinity of the Loudonville Reservoir are served by the Upper Service Pump Station and Upper Service Tank (150,000 gallons).

The Upper Washington Pressure Zone was established in 2020 as an intermediate zone between the main service area and the Pine Bush service area. This service area is supplied by a water booster station at Colvin Avenue and a 750,000-gallon concrete ground storage reservoir, water booster station, and steel standpipe located at the W. Averell Harriman State Office Campus. These assets are located near the Western Avenue entrance to the W. Averell Harriman State Office Campus and have been operationally incorporated into the new Upper Washington Pressure Zone. The AWB owns these assets and has a permanent easement at the W. Averell Harriman State Office Campus.

Water from the Supply Conduit is distributed to the City through a series of feeder mains. The distribution system carries water from the feeder mains to the consumers. The distribution system consists of approximately 376 miles of pipes which range in size from 4-inch diameter to 36-inch diameter. There are over 8,700 valves in the distribution system to provide flow control during system maintenance. The distribution system includes approximately 3,000 fire hydrants.

Much of the distribution pipe mileage in the System is unlined cast iron, the primary construction material used before 1930. Since 1973, the installed distribution pipe material has been cement-lined ductile iron.

The distribution system is the oldest part of the Water System. The oldest water mains may date back to 1851, the year the water system transitioned from private to public. Greater than 20% of the existing distribution system was placed in service prior to 1900. Pipe is replaced on the basis of frequency of repairs, or in conjunction with street reconstruction projects. The AWB has a crew that is proactively performing leak detection in the system.

The AWB currently has interconnections with the Towns of Bethlehem and Guilderland and supplies water to these communities as needed under purchase water agreements. There are also two emergency interconnections with the Latham Water District in the Town of Colonie. One near the Loudonville Reservoir has a capacity 7.4 MGD and one on New Karner Road has a capacity 3.5 MGD.

2.2 Water System Supply Reservoirs

The upland supply reservoirs, on Basic Creek and at Alcove Dam, were constructed in the late 1920's and early 1930's. These reservoirs continue to serve as the sole source of water supply to the City.

The initial development of the reservoirs used the runoff from the Hannacrois and Basic Creeks. Diversion dams, constructed on the streams, collected the natural flow of the streams into reservoirs. A tunnel constructed a short distance upstream from the Basic Creek Reservoir conveys water in an easterly direction, through a dividing ridge, to Silver Creek, a tributary of the Hannacrois Creek.

The Alcove Dam, constructed in 1928-1930, is a rolled earthen embankment with a reinforced concrete corewall. The Alcove Dam is approximately 2,177 feet long, which includes a 300-foot concrete spillway. The maximum height of the Alcove Dam is 81 feet, and the base of the dam is 485 feet wide. The Alcove Reservoir contains an estimated 13.3 billion gallons of water with a surface area of more than 1,392 acres.

The Basic Creek Dam was constructed circa 1928, is a rolled earthen embankment with a reinforced concrete corewall. The Basic Creek Dam is approximately 865 feet long, which includes a 100-foot

concrete spillway. The maximum height of the Basic Creek Dam is 21 feet. The Basic Creek Reservoir contains approximately 646 million gallons of water with a surface area of more than 240 acres.

2.2.1 Condition of the Water Supply Reservoirs

The Alcove Reservoir is the primary source of raw water supply for treatment to the Albany Water System. The reservoir is in serviceable condition. The reservoir's low level outlet gate and raw water service gates were replaced in 2019. New stop logs were also acquired in 2019.

A new reservoir field station, service garage, and two storage garages were completed in the fall of 2023 and are located at the north end of the dam. The new facility includes a single-story building that houses security and watershed personnel and operations. A heated service garage was constructed for staff to maintain equipment, and two additional garages were built for the storage of vehicles. The former farmhouse office building is tentatively planned for demolition in 2025. . Additionally, a building on AWB property, generally referred to as the Kline Stone House is planned for removal due to advanced deterioration of the structure.

The adjacent barns are showing signs of age, but AWB is considering retaining the existing four barns for material and equipment storage. Historically, these barns were sprayed to control and/or avoid powder post beetle infestation, but spraying was discontinued. No recent damage has been observed by the AWD. The metal chemical storage structure paint is peeling and missing in some small areas.

At Alcove Reservoir, the eaves of the intake structure roof shows signs of continued deterioration. The eaves should be addressed to prevent damage to the roof system. Recent visual assessment of the intake structure roof identified that replacement is necessary and should be performed before the roofing system fails. Additionally, the historic windows are showing signs of deterioration and should be repaired to maintain the weather tightness of the intake structure. Reportedly, the lighting within the intake structure requires frequent replacement and options for upgrading the lighting to provide longer life should be evaluated.

The principal spillway is approaching 100 years of active service without significant repair. The 300-foot concrete spillway discharges to an earthen and rock armored spillway chute defined by concrete sidewalls. Repairs to the spillway and spillway channel are required to remove vegetation, repair cracking, spalls, and areas where concrete loss is evident in the shotcrete façade and other exposed potions of the mass concrete. This work should include removing vegetation, grouting, or sealing smaller cracks, injection grouting of larger cracks, and placement of mesh reinforcement in areas of larger concrete loss. AWB is considering options for repairs, versus a comprehensive evaluation and upgrade of the spillway and sidewalls. A more comprehensive repair of the concrete spillway and spillway sidewalls is likely necessary to provide another 100 years of serviceability. Work to the spillway is planned after the implementation of the Basic Creek Dam and Rensselaer Lake Improvements.

The asphalt surface on the crest of the Dam has been identified by the NYSDEC as requiring attention. The asphalt surface is cracked with vegetation growth and has an undulating surface that does not provide uniform overtopping protection during major storm events. AWB has contacted qualified companies to assess if repairs and resealing are feasible, however due to the advanced deterioration of the asphalt, only full replacement is considered feasible. Replacement of the asphalt surface would entail the complete removal of the existing surface, releveling the underlying embankment, placement of

subgrade and/or base material, and a new asphalt driving surface. This will re-establish a uniform and durable crest protection. This work will likely require a dam safety permit and should be coupled with a survey of the finished surface to demonstrate to NYSDEC dam safety that the minimum design elevation has been restored.

Seepage discharged at the toe of the right abutment is conveyed away from the toe of the embankment through corrugated metal pipes, which have been halved to create a swale. Deterioration and damage require routine maintenance and replacement occurs when necessary.

Photo 2-1. Alcove Reservoir Dam

AWB's Dam Safety consultant has conducted investigations at Basic Reservoir and prepared 60% design documents for the selected rehabilitation alternative to bring the dam and spillway into NYSDEC compliance. This includes drainage improvements and strengthening of the embankment section, increasing spillway capacity, addressing the downstream concrete, and upgrading the access bridge to allow for access by mowing equipment. The rehabilitation work will address the deteriorating concrete of the spillway and the exposed top of the concrete core wall. This work will also address the environmental

restrictions which prevent AWB from accessing the embankment by driving equipment through the channel. The AWB is seeking NYSDEC WQIP and WIIA funding for this work.

A safe yield study was completed in 2021 for both the Alcove and Basic Creek Dam. The study indicated that the Basic Creek normal pool elevation could be significantly lowered, with operational changes, without significant impact to the overall system safe yield. Subsequently, an additional Basic Creek Dam rehabilitation alternative was prepared and presented in a letter report, which would lower the normal pool elevation thereby reducing the volume, height, and hazard designation for the facility with a corresponding reduction in capital cost. A second letter report was prepared which presented the construction of a piano key spillway which would provide enough spillway capacity to prevent overtopping of the dam during the spillway design flood; however, does not reduce the dam safety classification of the dam. AWB is proceeding with the detailed design of the piano key spillway and maintaining the existing normal pool level.

The eves and soffits of the roofs for the gate house and intake have continued to deteriorate, but both structures still appear to be weather tight. Repairs to both structures will be addressed in a detailed design of the Basic Creek Dam Safety Improvements. Repairs will be made to maintain the integrity of the structures and protect the equipment from the weather. The concrete bridge to the diversion tunnel gate house has areas of missing and spalled concrete which will be repaired to prevent the bridge from becoming unsafe. This project is listed in the Environmental Facilities Corporation 2023 Intended Use Plan.

The diversion tunnel has sluice gates and stop logs. The sluice gates will be replaced in upcoming years. The configuration of the diversion tunnel is expected to be modified.

Photo 2-2. Basic Creek Reservoir Gate House

The Basic Creek Reservoir has been declared an "impaired water body under Section 303(d) of the Federal Clean Water Act. The impairment from the water quality standards is due to a concentration of Phosphorous, the principal source being from agriculture activities in the drainage basin. The Basic Creek Reservoir was used in the winter of 2016-2017 to augment the Alcove Reservoir. The Basic Creek Reservoir will be used each year when water quality of this source is suitable and if Alcove Reservoir levels drop below normal levels.

The AWB was awarded a NYSDEC grant for land acquisition for watershed protection. The focus of the grant is to benefit water quality in the Alcove and Basic Creek Watersheds. Four parcels have been identified and approved by the NYSDEC for acquisition. These parcels have been appraised and discussions are ongoing for either fee title purchase of the property or purchase of a conservation easement over the property. The AWB was also awarded a FEMA High Hazard Potential Dam Grant for preconstruction activities associated with the planned dam rehabilitation project.

AWB purchased the Bichteman property located on Route 143, between Basic Creek and Alcove Reservoirs. It was purchased for watershed protection in the 1960’s through a life estate, which allowed the owners to live on the property until their death in 2018. The buildings on the property are planned for demolition in 2026.

2.2.2 Recently Completed and Planned Projects

In the 2012 Capital Improvement Budget, money was allocated to bring the Alcove Dam into compliance with NYSDEC Regulations. This work included the addition of the piezometers, stop logs and leak repairs.

In 2015, a consultant was retained for professional services regarding Dam Safety, and they completed Engineering Assessments (EA) for both the Alcove and Basic Creek Reservoirs. The findings of this evaluation provided recommendations for specific rehabilitation activities to bring the dams into compliance with NYSDEC Dam Safety regulations. The initial EA was completed for Basic Creek Reservoir using conventional parameters, no field exploration. For Alcove Reservoir the EA was completed using limited existing site-specific information.

EA findings for both Alcove and Basic Creek Reservoir were submitted to NYSDEC in 2016. Site specific field explorations, including rock and concrete core sampling, soil borings, the installation of additional piezometers, and laboratory testing were completed. Amended EA for Alcove Reservoir was submitted to the NYSDEC in January 2018 and Basic Creek Reservoir in December 2017.

Alcove Reservoir Gate Rehabilitation Project was designed in 2017 and construction began in 2018. This project included the replacement of five water supply gates located within the gatehouse, including the two outlet gates and two of the four inlet gates. The main drain gate (low-level outlet) was also replaced. This project was completed in January 2019.

A preliminary design for the Basic Creek reservoir rehabilitation was completed in 2019. In 2021, a safe yield analysis and bathymetric survey was completed at Alcove and Basic Creek Reservoirs. In 2022, two preliminary design letter reports were presented, one for the lowering of the reservoir level, and the other for adding spillway capacity to the existing Basic Creek Dam. AWB is proceeding with the detailed design of the piano key spillway and maintaining the existing normal pool level. In February 2024, the 60%

design was revised and resubmitted to AWB for review and comment. The 90% design is planned for completion in early 2025. 2024 work also included additional drilling, testing and evaluations for advancing the diversion tower. The AWB submitted applications for NYSDEC WQIP and NYSEFC WIIA grants for both Basic Creek Reservoir and Rensselaer Lake in 2024. AWB was not awarded grants for this round but plan to reapply in 2025. AWB is currently applying for funds from the High Hazard Potential Dams (HHPD) grant program for Rensselaer Lake, under FEMA's National Dam Safety Program.

In 2017, the AWD entered into a Working Woodlands Program with the Nature Conservancy to serve as the foundation for certification under the Forest Stewardship Council and the establishment of a Conservation Easement to improve forest health, provide options for long-term watershed protection, and new sources of revenue from the sales of carbon credits on the Voluntary Carbon Market. The AWB has received approximately $983,000 from the sale of carbon credits to date. The AWB will use $37,000 of the funds for a red pine clear cut harvest and a deer exclusion slash wall which is planned to begin at the end of 2024.

A pilot project began in 2017 for the addition of sodium permanganate at the Alcove Reservoir, as a replacement for the use of potassium permanganate at the Feura Bush Filtration plant. This pilot showed to be successful in reducing total organic carbon (TOC), and permanent facilities was completed in 2022.

The construction of a new reservoir field station office for security and watershed staff was completed in fall 2023. The existing office in the farmhouse will no longer be in use. Adjacent to the new field station a maintenance garage and two storage garages were also added. The removal of the previously used Alcove Reservoir buildings is expected to occur in 2025.

Recent projects are summarized in Table 2-1 below.

Table 2-1. Recent Improvements at the Water Supply Reservoirs

Recent Improvements	Construction Date
Two new piezometers in the Alcove Reservoir	2013
New stop logs and leak repairs in the main drain valve at Alcove Reservoir.	2013
Installation of additional piezometers at Alcove Reservoir	2016
Working Woodlands Program - forest management at the Alcove	Began 2017
Alcove Reservoir gate replacement	2018-2019
Alcove Building Replacement	2022-2023
Sodium Permanganate Facility	2022-2023
Alcove Office and Garage Buildings	2022-2023

For 2025 the following projects have been identified. These projects include both studies and the implementation of repairs.

- Alcove farmhouse is tentatively planned for demolition.

- Detailed design of Basic Creek reservoir dam safety improvements.

Tables showing summaries of planned projects for the next five years is provided in Appendix A, Five Year Capital Improvement Program (2025-2029) Summary of Costs.

2.3 Supply Conduit

The transmission system consists of supply conduits that carry raw water from the Alcove Reservoir to the Feura Bush Filtration Plant and treated water from the Feura Bush Filtration Plant to the City's distribution system.

The first supply conduit section carries raw water from the Alcove Reservoir, through the Town of Coeymans and into the Town of Bethlehem. The conduit subsequently enters the water filtration plant located near the hamlet of Feura Bush. This raw water supply conduit consists of 43,965 feet of 48-inch diameter cast iron pipe. At a point approximately 12,000 feet downstream of the Alcove Dam, the supply conduit crosses a ravine in a reinforced concrete box shaped bridge. The three spans crossing the ravine are 25 feet, 28 feet, and 25 feet in length respectively.

Approximately 4,500 feet upstream of the Feura Bush Plant, the conduit crosses the Onesquethaw Creek. At the Onesquethaw crossing, a single span steel bridge, constructed in 2001, supports the 48-inch supply conduit and the 36-inch filtration plant process wastewater drain. New insulated ductile iron piping, control valves, and waste blowoffs were included in this construction.

From the Feura Bush Filtration Plant, the second supply conduit section traverses the Town of Bethlehem and enters the City through the southerly City limit near Delaware Avenue (N.Y.S. Rte. 443). This treated water supply conduit consists of 34,374 feet of 48-inch cast iron pipe. At the Selkirk Railroad Yard, southeast of Feura Bush, the conduit consists of parallel 42-inch pipes which are located within a 1,156-foot-long reinforced concrete tunnel. There is a brick gate house at one end of the tunnel and a metal hatch at the other end.

The supply conduit is also protected at other railroad crossings between the Feura Bush Filtration Plant and the City. Just below the Feura Bush Filtration Plant, under what was once the West Shore Railroad, the conduit is set in a rectangular reinforced concrete tunnel 61.5 feet in length.

A similar tunnel structure exists at a single-track crossing of the former Delaware and Hudson Railroad in Elsmere. This tunnel is 35.5 feet in length. At the Delmar Bypass, the supply conduit crosses the highway in a concrete tunnel.

The third section of the supply conduit continues from the Normans Kill crossing at the southerly City limit just north of Delaware Avenue, through the City, to the Loudonville Reservoir for a distance of approximately 24,000 feet. It consists of 48-inch cast iron pipe throughout its length, with the exception of a 42-inch section between Myrtle and Clinton Avenues, and the CSX crossing noted below.

From the Normans Kill crossing, the supply conduit crosses the New York State Thruway in a reinforced concrete tunnel and continues northerly into the City crossing Whitehall Road, Hackett Boulevard and New Scotland Avenue, and runs along Lake Avenue, between New Scotland and Livingston Avenue. The conduit extends northerly from Livingston Avenue to the Loudonville Reservoir. At Tivoli Hollow, the conduit crosses under CSX railroad tracks within a rectangular reinforced concrete tunnel 91 feet in length. The tunnel encloses two 36-inch water pipes. There are three 36-inch valves in valve pits at each

end of the tunnel. From the northerly end of the tunnel, the 48-inch conduit continues to Albany Shaker Road to the Loudonville Reservoir. At the Interstate 90 (Crosstown Arterial) crossing, the conduit passes through a concrete tunnel.

Valves in the first and second sections of the supply conduit are located at the Alcove Dam, the Feura Bush Filtration Plant, the Selkirk Railroad Yard crossing, and the Normans Kill crossing. Within the third section, that which traverses the City proper, the supply conduit has been provided with main line valves at regular intervals. These additional valves permit conduit repair without interrupting the delivery of water to the distribution system, either from the Feura Bush Filtration Plant or from the Loudonville Reservoir.

There are two permanent emergency interconnections with the Latham Water District in the Town of Colonie. One near the Loudonville Reservoir with a capacity of 7.4 MGD and one on New Karner Road with 3.5 MGD.

2.3.1 Condition of the Supply Conduit

The current carrying capacity of the supply conduit is estimated at 30 MGD and appears to be adequate for serving the existing service area. At current and projected system demands, the distribution storage reservoirs at Loudonville, combined with the available capacity of the Latham Water interconnects, will provide approximately twenty days of capacity for the City during a filtration plant shut down or emergency repair.

There are two areas along the supply conduit that are not easily accessible due to large stones that were backfilled into the original supply conduit excavation. The AWD plans on removing the stones and providing better access at these locations.

The Selkirk Tunnel gate house could use repair. The building windows are in need repair or replacement. Three valve gate stands are located inside the building and need to be replaced. The pressure inside the supply conduit is monitored with a pressure sensor and the data is transmitted to the SCADA system. At the Coeymans Crossing, one of the concrete roof panels has broken and partially collapsed. The cause is unknown and will be further investigated in 2025.

2.3.2 Recently Completed and Planned Projects

The Normans Kill crossing was reconstructed in 2000 after a major landslide along Delaware Avenue. NYSDOT relocated the channel of the Normans Kill and the original watermains were replaced in the new alignment.

The Onesquethaw Bridge was replaced in 2001. This project started as a repair to the existing bridge, but as the existing concrete was removed for replacement, it became clear that the entire structure needed to be replaced. New ductile iron piping, control valves and waste blow-offs were included in construction.

In the mid 2000’s, repairs on the Selkirk Yard Tunnel were performed around the same time as part of security improvements.

In 2017, the elevated conduit crossing in Coeymans was repaired. In addition, the area surrounding the crossing was regraded and a drop stormwater structure installed. In 2019, the road was washed out at this location. The road was reestablished, and a new culvert installed. The exterior flat roof currently has weighted tarps covering the top to mitigate precipitation entering the structure due to a broken concrete

roof panel. The AWB plans on removing the concrete roof panels in 2025 to evaluate the condition of the entire structure and will plan for repair or replacement of this structure.

Repairs to the slate roof and the brick wall of the gate house at the Selkirk tunnel was completed in 2018.

In 2017, erosion was discovered at two locations in the vicinity of the supply conduit at Normanskill Farm in Albany, NY. The farm is situated between I-87 and the Normans Kill Creek. Stormwater runoff from I-87 flows down an area with a steep grade and little vegetation, and had caused the development of small channels, or rill erosion. A design was completed in 2018 for improved access and drainage, and construction was completed in 2019. This location now has a 3000 linear foot gravel access road, vegetated and stone lined drainage swales, and a three-foot by eight-foot concrete culvert to convey stream flow under the access road.

In 2019, a 24-inch branch valve off the transmission main was replaced in the vicinity of the Stephen and Harriet Myers School. This required a shut down at the Feura Bush Water Filtration Plant and the transmission main.

The AWB undertook a project in Tivoli Preserve to daylight the Patroon Creek and provide enhanced protection of the 36-inch and 48-inch supply conduits in the floodplains of the Patroon Creek. This project included grant funding from New York State.

In 2020, permanent piping was installed for an emergency interconnection with the Town of Colonie (Town) at the Loudonville Reservoir. In 2024, permanent piping was installed for a similar emergency interconnection with the Town at New Karner Road. The Loudonville Reservoir interconnection has a capacity of 7.4 MGD, and the capacity of the New Karner Road interconnection is 3.5 MGD

AWD installed (2) 12-inch pressure relief valves on the transmission main on the south side of the Normans Kill in 2021. The old pressure relief valve location on the north side is now be utilized as a blow-off.

The AWD has allocated funds each year to perform condition assessments of the supply conduit and valves as part of the preventative maintenance program. Bonds of 2021 included $200,000 for condition assessment which were used to inspect and exercise the large valves along the transmission and feeder mains. In 2022, repairs were completed on many of the vaults along the transmission main, and an outside vendor was awarded a contract to clean, exercise, and evaluate valves. During the condition assessments some inoperable valves were identified on the bypasses of the large gates along the 42-inch and 48-inch transmission mains. The inoperable valves are planned for replacement and have been included in the application for EFC DWSRF 19554.

Table 2-2. Recent Improvements to the Raw Water Supply Conduit

Recent Improvements	Construction Date
Replacement of Onesquethaw Bridge	2001
Repairs to Selkirk Yard Tunnel	Mid 2000's
Repairs to elevated conduit crossing in Coeymans	2017
Repairs to CSX Tunnel Gate house roof	2018

Improved access and drainage at Normanskill Farm	2019
24-inch branch valve replacement	2019
Emergency interconnections with Latham Water District	2019
Tivoli Preserve Stream Daylighting	2019
New pressure relief valves	2021
Cleaned, exercised, and repaired transmission and feeder valves	2022-2023

Future projects to be considered, but are not currently scheduled, include

- Evaluation of the elevated conduit crossing in Coeymans.

Tables showing summaries of planned projects for the next five years is provided in Appendix A, Five Year Capital Improvement Program (2025-2029) Summary of Costs.

2.4 Feura Bush Filtration Plant

The Feura Bush Filtration Plant, located in the Town of Bethlehem, is a conventional rapid sand filtration plant with 8 rapid sand filters, each rated at 4 MGD.

Photo 2-3. Ceiling View of the Sand Filter Gallery in the Feura Bush Filtration Plant

The current treatment process within the plant features:

- Aeration
- Hydraulic flocculation

- Settling of solids in the sedimentation basins
- Chlorination on the influent of the filters
- Filtering of the water through the rapid sand dual-media filters
- Addition of lime for corrosion control
- Addition of chlorine for disinfection and residual
- Chlorine contact in clearwell
- Storage for backwash of filters

The AWD made substantial changes to the water treatment process in 2018. Chemical upgrades included finalizing the change from gaseous chlorine to liquid sodium hypochlorite and committing to a permanent sodium permanganate addition facility at the Alcove Reservoir instead of adding potassium permanganate at the plant. As of 2024, the permanent sodium permanganate system is complete and operating on the plant SCADA system. Mechanical mixers installed in 1962 are not used because hydraulic mixing was found to be adequate. All switch gear was removed as part of the building renovation work that commenced in 2018, but the flocculators (paddles, drives, and motors) have not yet been removed. Removal of this equipment has been incorporated into the Filter Upgrades Phase 1 – Mixing Basins project, which was anticipated to begin design in 2024 but has been delayed to secure additional funding.

Although major capacity upgrades have not been necessary, the filtration plant has been the subject of many improvement programs since its original construction. The enclosed structures are subject to high humidity and water submergence in the interior, as well as to normal wear from weather exposure on the exterior. The existing water treatment processes consistently produce high quality water.

2.4.1 Condition of the Feura Bush Filtration Plant

In recent years the AWD has been evaluating the plant as a whole and a Water System Comprehensive Improvement Plan was developed. In 2019, the AWB and Albany Municipal Water Finance Authority (AMWFA) adopted this plan, passed a bond resolution, and a financial application for the next improvement was submitted to EFC (EFC DWSRF #18523). A subsequent financial application was submitted to EFC in DWSRF #18903, and another financial application is proposed (DWSRF #19157). Significant repair and upgrades to the facility are planned and/or underway, and long-term financing has either been acquired or applied for.

Below is a bulleted list of items that should be addressed. If the AWB currently has a plan to address an item, a description is provided below. This list has been categorized by area of the facility, starting with the raw water entering the facility and ending with finished water leaving the facility.

Treatment:

- Mechanical flocculators are no longer used. The baffles in the flocculation chambers were hydraulically modelled and found to provide suitable mixing, so the mechanical mixers are planned for removal as part of the Filter Upgrades Phase 1 – Mixing Basins project.

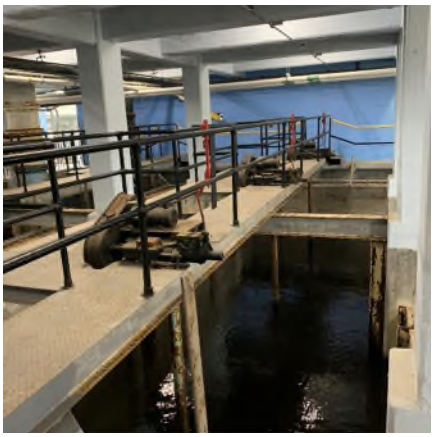

Photo 2-4. Partially Demolished Mixers in the Feura Bush Filtration Plant

- Sluice gates at the flocculation chambers were cleaned, operated, and evaluated, and the mixing basins cleaned and evaluated in 2023. A report was developed that provided condition assessments and recommendations for repairs. The sluice gates and flocculation chambers will need to be repaired or replaced. .The concrete walls of the rapid mix and flocculation chambers need to be assessed.
- The influent and effluent gates for sedimentation Basins 1, 2, and 3 should be made operable so that the basins can be isolated for maintenance. Repairs and inspections have been made in recent years, but plant staff believe they still leak. The inlet sluice gates were inspected and adjusted in 2016. The inspection suggested that the gate stems are too short to seat properly. Actuators were repaired in the summer of 2019. The plant plans to purchase manual actuators for all influent gates to Basins 1,2, and 3 in 2025.

  Plant staff have observed leaking from the exposed wall of Basin 1 and believe a structural analysis of Basins 1, 2, and 3 is advisable.

Photo 2-5. Leaking Exposed Wall in Sedimentation Basin 1

- Filter media was replaced in Filters 3 and 4 in 2013 but the performance of these filters was initially not as good as the other six filters, so plans to continue with media replacement for the other filters were cancelled. During replacement of media in Filters 3 and 4, filter wall deterioration was noted.

  Full rehabilitation of all the filters is scheduled over the course of a two-phase project to be completed in 2026. The project includes an assessment of the underdrains, a potential replacement of the underdrains with a new system based on that assessment, new filter media, and structural repairs. Replacement of filter valves and actuators was completed with the plant valves/actuators replacement project in 2024. The filter valves and actuators are not yet being controlled by the plant SCADA system. A planned control system upgrade of the new SCADA system will allow the plant to integrate the new filter equipment.

- The existing dry lime feed system needs replacement and is not in use. The plant constructed a pilot liquid lime system at the end of 2022. Based on the success of this pilot and the projected costs of a liquid lime system compared with a dry lime system, a full-scale liquid lime system was designed in conjunction with the new maintenance facility, which will be a new building adjacent to the clearwells. The maintenance facility/lime system project has been awarded and construction is expected to start at the end of 2024.

Photo 2-6. Existing Dry Lime Feed System in the Feura Bush Filtration Plant

- Filtration Plant sedimentation basins are cleaned by decanting clean water from the basins to near the top of the sludge blanket and discharging the sediment basin's entire remaining contents to wastewater lagoons. The decanting pumps were installed as part of the sedimentation basin building rehabilitation project to prevent the plant from having to discharge the volume of a full sedimentation basin to clean sludge from the basins. Plant personnel report that the decanting pumps have helped reduce the amount of water discharged to the lagoons.
- Additional sludge management alternatives are being considered, such as purchasing sludge dewatering equipment. This would allow the operators to thicken and stage dewatered sludge at the plant site, thereby allowing better lagoon management and savings on lagoon dredgings with a smaller quantity of sludge from filter backwashes. Plant personnel noted that under current operations the lagoons must be dredged approximately every 18 months, resulting in an approximate annualized cost of $100,000. Sludge dewatering will be considered in the next comprehensive plan.
- Improvements to Lagoon 3 are in construction as of 2024. The lagoon has been cleaned and the influent valve and underdrain system are being replaced.

- The facility stopped using acid alum in recent years, and as a result, there is less sludge being created so the sedimentation basins require cleaning less frequently. A beneficial use determination (BUD) is being pursued to allow continued use of the Feura Bush Filtration plant site for the ongoing storage of dried sludge and use of an old quarry site at the Alcove Reservoir as a site for fill.

In 2023, the City awarded a Master Services contract to a company that specializes in aqueous inspection of tanks and structures. They evaluated several AWD structures for cleanliness, structural condition, and coatings, and ranked based on a score of 1 to 5. At the filtration plant, they inspected the clear wells, aeration basins, mixing basins, and wash water tanks. Some typical recommendations included cleaning surfaces to remove biofilm, sediment, and spall, monitoring surfaces for cracks, ensuring all hatches have a lock, maintenance, and remedial repairs. High priority recommendations include cleaning and structural repairs for the aeration basin, cleaning and security on the interior of Clearwell 1, cleaning and safety issues on the interior of Clearwell 2, cleaning, safety, and structural repairs for Mixing Basin 1, 2, & 3. Filter No. 2 condition assessment is planned prior to the end of 2023. The AWB is considering the recommendations and how to proceed. The mixing and aeration basin upgrades are included in EFC DWSRF 18903.

Finished Water:

- The AWD had divers investigate the finished water clearwells at the end of 2017 and they were cleaned and inspected again in 2022.

Facilities:

- Extensive renovations were undertaken to rehabilitate the offices, operator's lab, and men's and women's restrooms in 2019. However, the HVAC systems in the renovated spaces do not operate to the satisfaction of plan staff and require modification.
- Multiple exterior doors at the plant require replacement, including the front double door, the back double and single doors, the exit onto the roof of the sedimentation building, and the double doors at the loading docks. These replacements are expected to be undertaken by plant personnel.
- In addition to the door replacement, the New York State Department of Homeland Security issued a report identifying vulnerabilities based on a site visit to the Plant. Some improvements to security cameras and recorders were completed in 2024. Items to be addressed include perimeter fencing, new doors, and door security systems.
- The main plant building's brick exterior was repointed on the front and partially on the sides in 2022. Repointing must continue around the sides and back of the building and along the retaining wall by the loading dock. The aeration building project has begun and it includes masonry repairs to the laboratory and the retaining wall near the loading dock. Work is anticipated to be completed in 2025.

Photo 2-7. Deteriorating Brick Mortar on North Side of Building and Retaining Wall

- The filtration plant has ceased using the Utility Cloud system which was set up for asset and data management. The Utility Cloud system was not well suited to digital management of process data due to lack of direct access to the server and the need to go through a third party to enter information in the system. Plant personnel migrated digital data management to SharePoint, which allows for easier data recording and instant access to data. SharePoint has also proved to be effective for asset management, logging maintenance and tracking workflows and orders and has replaced the Utility Cloud system for these purposes.

The Feura Bush facility is manned 24 hours a day, 7 days a week. As such, the furnishings and domestic equipment is used regularly.

2.4.2 Recently Completed and Planned Projects

A variety of studies and construction projects were completed at the Feura Bush facility over the last couple of years which included improvements to the roof, office space, and water treatment.

In 2016, a study was completed to evaluate embankment stabilization near Lagoon #2. This included surveying and subsurface exploration for embankment stability. The recommended risk reduction measures were implemented in 2019. In addition, extensive renovations were undertaken to rehabilitate the offices, operator's lab, and men's and women's restrooms.

In 2017, an energy efficiency study was completed that evaluated the potential for energy generation at the plant, identified deficiencies in the building envelop, and discussed potential system improvements to improve energy efficiency. In addition, the filtration plant stopped adding acidified liquid alum to the treatment process, with the storage tanks repurposed to store sodium hypochlorite. Replacement sodium

hypochlorite tanks were purchased following a 2020 routine Chemical Bulk Storage Tank inspection due to minor leaks in the existing tanks. The new storage tanks were installed in 2021.

Photo 2-8. New Sodium Hypochlorite Tanks

SCADA system hardware and software upgrades began in 2017 and hardware installation at the plant was completed in 2024. Upgrades included new PLCs and a new SCADA operating platform. The upgrade included Allen Bradley Plant PAX Version 4.1, but the new equipment is being upgraded to Version 5. The hardware needing upgrades was purchased in 2018 and was installed along with HMI compatible equipment after the office, lab, and other building upgrades were completed. Control room updates were completed in 2021. Currently, the Pine Bush Pump Station, Washington Avenue Tank, and some small cellular RTU stations are still operating on the legacy SCADA system. All facilities located at the plant are operating on the new system with the exception of the new filter valves and actuators. This equipment will be integrated into the new SCADA system after the control system upgrade to Allen Bradley Plant PAX Version 5. The Loudonville UV facility has been integrated into the new SCADA system.

The building oil-fired boiler and the heating distribution system was replaced in 2019. In addition, AWD staff made repairs to the compressor used with the domestic water system.

Repairs to the sedimentation basins were completed in 2021. Work included replacing the roof over the sedimentation basins and replacing the drain valves, bracketry, and inlet outlet gates and actuators for sedimentation basins 4-6.

Electrical upgrades at the plant were completed in 2023.

Plant valves and actuators were replaced in 2024, including the influent raw water butterfly valves and leaking taps on the raw water line.

AWB plans on implementing a fluoridation system at the filtration plant in 2025/2026. The City of Albany enacted a local ordinance in 2024 requiring the fluoridation of the treated drinking water, and the engineering design is underway. AWB is applying for a $1 million NYSDOH grant for construction.

A summary of the improvements is presented in Table 2-3 below.

Table 2-3. Recent Improvements to the Feura Bush Water Treatment Facility

Recent Improvements	Construction Date
Replacement of Media in Sand Filter #3 & #4	2013
Replacement of the Influent PRV and Building Modifications	2014
Roof replacement and masonry work (Main Office Wing)	2016
Repairs to influent gates in Sedimentation Basins 1,2, and 3 and inspection of Basin walls.	2016
Replaced electric actuator on the plant influent valve (36" butterfly valve)	2017
Roof repairs and masonry work - Aeration and Laboratory building	2017
Sodium hypochlorite chemical feed systems	2017
SCADA system hardware and software upgrades	2017-Continue
Lagoon #2 stabilization	2018
Boiler/Heating system	2018
Domestic water compressor repairs	2018
Employee space improvements DWSRF #18378	2019
Sedimentation basin roof replacement and Basins 4-6 repairs.	2021
Sodium hypochlorite tanks replaced	2021
Masonry repairs to the west wall of the Filter Building	2021
Plant electrical upgrades	2021-2023
Repairs to spalling concrete in the ceiling of the wash water tank	2023
Plant Valves and Actuators Replacement	2024

2.4.2.1 Current Studies and Designs

The following studies and construction projects are currently proceeding at the Filtration Plant:

- Construction of the new liquid lime storage system and maintenance building – anticipating mobilization late 2024.
- Improvement of the ventilation and damp-proofing, and re-coating pipes in the aeration basin room – anticipating mobilization in late 2024.
- Elevator replacement design has been put on hold until completion of the lime system.
- SCADA improvements are mostly complete. A control system upgrade is required to integrate the new filter valves/actuators.

The following projects are planned for 2025:

- Design of Phase 1 of the Filter Upgrades/Mixing Basins project. This project will include rehabilitation of the mixing/flocculation basins and removal of the abandoned mixing paddles and replacement of sluice gates in the flocculation basins.
- Begin construction of fluoridation system

Other projects to be considered, but are not currently scheduled, include:

- Lead paint remediation for walls in Filter Pipe Gallery. Paint has tested positive for lead and is peeling from walls. This work will likely be incorporated into either Phase 2 or Phase 3 of the filter's rehabilitation project.

Photo 2-9. Peeling Lead Paint Leading to Filter Pipe Gallery in the Feura Bush Filtration Plant

- Repairs to the stairs accessing the filter pipe gallery and the catwalk and ship ladders in the filter pipe gallery.
- Painting of new piping/valves in the filter pipe gallery. This may be undertaken by plant personnel.
- Improvements to vacuum priming systems for domestic water and washwater pumps. Plant personnel have replaced a pump and repaired a separator tank to return the system to full redundancy. However, plant personnel believe the full system should be evaluated for replacement in the future.
- Milling and paving of all pavement in the driveway and around the building. This pavement has been cut repeatedly for various projects and the uneven surfaces have become a safety hazard. The lime and maintenance building project includes repaving of some of the driveway in front of the building and garage.

Photo 2-10. Cut/Uneven Pavement Requiring Repaving

- With the construction of the new lime facility, the entire second story of the main plant building will be available. Plant personnel would like to have an architectural evaluation of this space completed for potential repurposing as a conference room or training room.

AWB has allocated funds for general improvements each year. A Water System Comprehensive Improvement Plan (Water Comprehensive Plan) has been developed and funding for some of the projects was acquired through the 2018 Drinking Water State Revolving Fund (DWSRF 18523). Additional funding for these projects was acquired through AMWFA bonds of 2021, and 2022 AWB

Drinking Water State Revolving Funds (DWSRF 18903). The current projects are funded with short term financing from DWSRF 18523 and DWSRF 18903. Tables showing summaries of planned projects for the next five years is provided in Appendix A, Five Year Capital Improvement Program (2025-2029) Summary of Costs.

2.5 Loudonville Reservoir

The Loudonville Reservoir consists of three open-surface, irregularly shaped, reinforced-concrete structures, generally referred to as Basins A, B, and C. Basin A (79,531,000-gallon capacity) and Basin B (27,415,000-gallon capacity) were constructed in 1930. Basin C (103,932,000-gallon capacity) was constructed in 1936. The total combined storage of the three basins is approximately 211 million gallons and can provide the City with approximately eleven days of water supply, at the current average daily production of 17 MGD.

The current process at the Facility consists of:

- Storage of treated water in the three basins delivered from the Feura Bush Water Treatment Facility through the supply conduit.
- Addition of calcium hypochlorite to the basins manually as needed in the spring, summer, and fall.
- Addition of sodium hypochlorite for viricidal disinfection.
- Ultraviolet (UV) disinfection of treated water leaving the storage basins.
- Addition of sodium hypochlorite via pacing to treated water entering the distribution system to maintain the disinfection residual.

The draining, cleaning, and inspection of a single basin is performed as needed when no planned shutdowns are anticipated for the water plant or supply pipeline. Cleaning of the basins on a routine basis and repair of noted deficiencies will increase the longevity of the reservoir structures. The chlorination and flow-control facilities, combined with proper maintenance, provide satisfactory water quality.

2.5.1 Condition of the Loudonville Reservoir

The facilities at Loudonville are currently in good condition, the AWD has made a number of improvements to the facilities in the past few years, however the age of the facilities lead to a host of minor problems. Below is a bulleted list of items that should be considered for inclusion in the long-term capital improvements for the facility.

Basin Condition:

- Basin C has not been drained in several years. The AWD has planned on draining this basin for the last couple of years; however, this has not yet occurred.
- The existing Basin C inlet structure is deteriorating and is only accessible via boat for inspection and maintenance. A new inlet structure and walkway is planned and it is anticipated that funding will be through EFC DWSRF 18903. The repairs have not yet been scheduled.

Gate Houses:

- Gatehouses A/B and C are generally in good condition. It was reported by AWD staff that the bottom side of floor slabs in both gatehouses show signs of spalling. They should be monitored and repaired if they worsen to avoid structural problems.
- The entrance ladder to the lower level of Gate House C currently does not have fall protection. Installation of fall protection should be considered.
- The HVAC systems in both gatehouses are not currently working so options for heating should be considered. The gatehouses are only accessed periodically, not manned regularly. The HVAC equipment was installed when chemical feed systems were operated in Gate House A/B. These systems were moved to the UV Building.
- The sodium hypochlorite feed for Basin A was moved to Gate House A/B. There has been discussion about relocating all sodium hypochlorite feed for virus inactivation to the gate houses. If the City decides to move the feed equipment the HVAC systems will need to be upgraded.

Water Leaving the Site:

- The 36-inch cast iron drainpipe to Patroon Creek has not been inspected. This drain is used to transmit surface drainage away from the site to the Patroon Creek, so it is in continuous use. It discharges in a culvert upstream to the new daylighted portion of the Creek. The manholes along the drain on Albany Shaker Road are equipped with blind flanges and tees for access for inspection, as the pipe is piped solid through the manholes. This drain should be considered for inspection. The drain was utilized to drain Basin A in 2024 and appeared to function properly.

Site Conditions:

- The various construction projects that have been completed at the site has required the cutting and patching of asphalt in several areas. This has resulted in the deterioration of roadways in multiple locations.

Photo 2-11. Condition of Asphalt near the Old Chlorination Building

2.5.2 Recently Completed and Planned Projects

The construction of the UV treatment building occurred in 2002 and 2003. The UV treatment system was constructed with four 10 MGD units, for a total capacity of 40 MGD. This system was installed to provide the best available disinfection at this location and to comply with EPA regulations for uncovered finished water storage.

In 2010, a major project was undertaken for viricidal disinfection using sodium hypochlorite.

Basin B was cleaned and inspected in 2015. No immediate repairs were required when the Basin was drained; however, repairs were recommended for the near term.

Basin A was drained, cleaned, and repaired in 2019.

A sodium hypochlorite feed system was installed at the A/B gatehouse for Basin A viricidal disinfection in 2020.

A dam safety inspection was completed in 2023 as part of the Emergency Action Plan. A 10-year Engineering Assessment is due in 2028.

Upgrades to the existing UV disinfection equipment were completed in 2024. The upgrades included demolition of the existing UV equipment, and installation of new reactors, lamps, UV transmittance (UVT)

monitors, operator interface terminals (OITs), programmable logic controllers (PLCs), hardware cabinets, and integration of the new equipment to SCADA.

Photo 2-12. New UV Reactors in UV Building

The AWD is in the process of converting the old chlorination building into a multi-use space with half the building being converted to an office for AWD staff and the other half housing a new lime feed system for pH control for treated water leaving the site, with a target of matching the 9.2 pH of treated water at the Feura Bush Filtration plant. The majority of this work will be completed in 2024; however, it will likely be completed in early 2025.

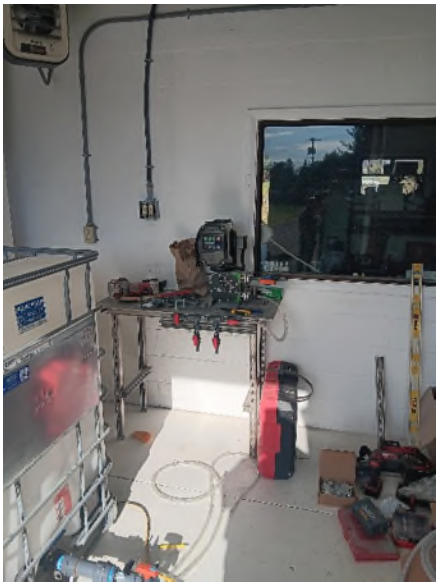

Photo 2-13. New Lime Feed System in Old Chlorination Building

There has been an assortment of additional upgrades to the facility. Table 2-4 below lists some of the site's most recent construction projects.

Table 2-4. Recent Improvements to the Loudonville Reservoir

Recent Improvements	Construction Date
Additional low-light CCTV cameras	2015-2016
Chemical storage sheds	2016
Gate house and northwest perimeter fence repair and replacement	2017
New chemical feed pump in the UV building	2017
Concrete cap repair for Basin C and construction of an influent channel screen in Basin A	2018
Basin A was drained and repaired	2019
Interconnection between Town of Colonie and the City of Albany	2019
Sodium hypochlorite feed system installed in gatehouse A/B	2020
Painted above grade piping	2020
Installation of sodium hypochlorite feed to Basin A effluent from gatehouse A/B	2021
Upgrades to the controls in gatehouse A/B.	2021
UV equipment replacement on UV train 1	2023
UV equipment replacement on UV train 2,3 and 4	2024
Conversion of old chlorination building to lime feed and office space	2024 (est. completion 2025)

There are currently no capital improvements projects planned for 2025.

Items to be considered, but are not currently scheduled, include:

- Review the potential of relocating the sodium hypochlorite feed systems to gatehouse A/B or gatehouse C.
- Replacement of existing sodium hypochlorite metering pumps with new peristaltic pumps in UV Building chemical room.
- Replacement of sodium hypochlorite storage tanks in UV Building chemical room.
- Yearly structural inspection of Gatehouse A/B and C concrete.
- Installation of a fall protection ladder in Gatehouse C.
- Asphalt repaving of site roads.

- Replacement of existing aging generators with new generators. The existing generators can only be utilized during power outages. With the addition of the new lime feed system, the existing old chlorination building generator is not in working order and because of its age should be replaced.

Tables showing summaries of planned projects for the next five years is provided in Appendix A, Five Year Capital Improvement Program (2025-2029) Summary of Costs.

2.6 Six Mile Water Works (Rensselaer Lake)

In 2002, the AWB acquired from the City of Albany a fifty-year leasehold interest in Rensselaer Lake (AKA Six Mile Waterworks) and surrounding properties owned by the City of Albany for possible future discretionary use as a supplemental emergency water supply.

Rensselaer Lake, approximately 43.4 acres in size, was created in 1851 and 1852 to serve as a water supply for the City through the construction of a low earth dam across the Patroon Creek. The dam was constructed of an earthen embankment with an 8-foot-thick clay puddle core in its center. The top width of the dam is approximately 10 feet with an upstream slope of 1.5 vertical to 1.0 horizontal, and a downstream slope of 2.0 vertical to 1.0 horizontal.

The Lake actively served the City from 1852 to 1909, at which time it was placed in a reserve status. Intermittent use continued until its cessation in April 1926. In 1947, the City created the Six Mile Waterworks Picnic and Recreation Area. The 200-acre grounds, including the Lake, were opened to the public for fishing, non-motorized boating, and picnicking. Since then, the Lake has generally been used for such recreational purposes. The site is part of the Albany Pine Bush Preserve.

Rensselaer Lake is replenished by both surface water and groundwater flows. The Lake's watershed is about 2.8 square miles in size, and includes residential, commercial, industrial, and transportation land uses. A mass water balance analysis indicates that the estimated safe yield of Rensselaer Lake as an emergency water supply, based solely on the surface water inflow, is 1.7 million gallons per day.

The geology is characterized by thick sand deposits with high permeability, containing large quantities of groundwater. A rough estimate of the groundwater inflow to the Lake was derived from a previous study using a theoretical approximation. According to the study, at the minimum level of the Lake used to determine the safe yield from surface water inflow, the estimated groundwater recharge or inflow to the Lake would be 0.7 to 2.2 million gallons per day. Combining the estimated surface water and groundwater inflows would indicate a total safe yield of the Lake as an emergency water supply of 2.4 to 3.9 million gallons per day.

The New York State Office Building Campus was connected to the Lake by piping constructed in the 1960's to provide cooling water to the Campus under an agreement with the City. The State of New York stopped using this prior to the AWB lease. The connection was severed, and the piping used to create a new blow-off.

2.6.1 Condition of the Six Mile Waterworks

Based on a limited water quality sampling and testing program undertaken in 2002, it appears the existing Lake water is of sufficient quality to meet current drinking water standards after treatment by conventional, readily available mobile treatment equipment. A suitable area exists at the site that would

allow ready ingress of the mobile equipment and would provide good access to the required electrical power and interconnecting piping. The AWB made significant improvements in 2003-2004, rebuilding the gate house, replacing the main drain, extending the drain piping away from the embankment, and grouting the embankment of the dam.

2.6.2 Recently Completed and Planned Projects

In 2015 emergency repairs were made when a sink hole appeared at the base of the embankment. The sink hole was due to the failure of the original brick conduit that once carried water from Six Mile Waterworks to Bleeker Reservoir. Flowable fill was used to fill the void and conduit.

A dam safety Engineering Assessment was initiated in 2016 and completed and sent to the NYSDEC in 2017. The assessment concluded that the dam should be reclassified as a high hazard dam and that improvements were needed. The NYSDEC responded that they were agreement and reclassified the dam as high hazard. Further they assigned the dam a condition rating of “Unsound, Deficiency Recognized” due to the inadequate spillway capacity and slope stability. The NYSDEC found the schedule provided for remediation of the dam acceptable but indicated that lowering the reservoir should be implemented as an interim safety measure. The preliminary design for the Rensselaer Lake Dam rehabilitation was completed in 2017 and 60% design was completed in 2019.

The interconnection with the Town of Colonie water supply has provided more emergency backup capabilities and the AWB no longer views Rensselaer Lake as a potential supplemental emergency water supply. This provides several options to bring the dam into compliance. The Alternatives Analysis for Rensselaer Lake in 2019 and the findings of this evaluation provided recommendations for specific rehabilitation activities to bring the dam into compliance with NYSDEC Dam Safety regulations. Alternative one raises the dam embankment approximately one foot and includes a new auxiliary spillway on the left side of the berm. Alternative two focuses on reducing the normal pool elevation at the dam to achieve a Class B-Intermediate Hazard Designation. Currently, Rensselaer Lake is maintained at the normal pool elevation.

In 2022, AWB awarded a contract for the consultant to proceed with the final design of the Engineered Auxiliary Spillway. This alternative maintains the normal pool elevation, and so the dam will still be designated as a High Hazard Dam. AWB was awarded two $100,000 FEMA funded grants for the final design for the Rensselaer Lake and Basic Creek Reservoir upgrades. AWB will be seeking additional funding opportunities for construction.

An engineering report for safety improvements at the Rensselaer Lake Dam was prepared in 2023. The AWB submitted applications for NYSDEC WQIP and NYSEFC WIIA grants in 2024 for dam safety improvements. They were not awarded grants from this round but plan to reapply in 2025. AWB is currently applying for funds from the High Hazard Potential Dams (HHPD) grant program for Rensselaer Lake, under FEMA’s National Dam Safety Program. The AWB no longer views Rensselaer Lake (Six Mile Waterworks) as having a role as an emergency source of supply and is seeking ways to fund dam safety improvements without placing a burden on water rate payers. Rensselaer Lake is an important regional resource as a park and component of the Pine Bush Preserve.

The table below lists some of the site’s most recent construction projects.

Table 2-5. Recent Improvements to Six Mile Waterworks

Recent Improvements	Completion Date
Filling of Brick Conduit	2015
Upgrades to Pavilion and Bathrooms	2016-2017
Exercising the lake's 36-inch butterfly valve for the low-level outlet	Annually

Tables showing summaries of planned projects for the next five years is provided in Appendix A, Five Year Capital Improvement Program (2025-2029) Summary of Costs.

2.7 Tivoli Lake Preserve

The Tivoli Lake Preserve is an 80-acre urban nature preserve located on the edges of the Arbor Hill and West Hill neighborhoods. In 1850 the City purchased the land in order to dam the Patroon Creek to form a reservoir for the public water system. In 1851 dams were constructed across Patroon Creek forming Upper and Lower Tivoli lakes, the upper lake was for storing and the lower for distribution. The Patroon Creek, a small urban creek approximately 6.8 miles long, flows through the Preserve on its way to the Hudson River from the Albany Pine Bush. Historically, the natural course of Patroon Creek has been altered many times by construction projects, dams and reservoirs and currently is used as natural drainage for the City of Albany, parts of Colonie and Guilderland, and Interstate I-90.

2.7.1 Recently Completed and Planned Projects

AWB has completed projects within the Tivoli Lake Preserve to protect the 36-inch and 48-inch transmission mains and other infrastructure that is located in the Preserve.

- Erosion mitigation study was completed in 2017
- A Hazard Class Assessment was completed and submitted to the NYSDEC in early 2018 and they accepted the Class A determination.
- Tivoli Lake Preserve Stream Daylighting Project – The AWB was involved with this project as it relates to the protection of the water transmission main. The construction includes measures to protect the transmission main during flooding conditions. Construction was completed in 2019. In 2020 there was additional work to repair damage done by storms and to provide additional hardening of the Tivoli Lake spillway.

Tables showing summaries of planned projects for the next five years is provided in Appendix A, Five Year Capital Improvement Program (2025-2029) Summary of Costs.

2.8 Water Pump Stations and Elevated Tanks

The City's distribution system is gravity fed from the Feura Bush Filtration Plant, with the exception of three areas, which include the Upper Service Water District (USWD), the Pine Bush, and the Upper Washington Pressure zone.

The Upper Service Water District (USWD) adjacent to Loudonville Reservoir and the Pine Bush both require pumping to provide adequate service pressure and fire protection. The USWD pump station is located within the Loudonville Reservoir property and the USWD elevated tank is located in the southeasterly section of the property. The 150,000-gallon storage tank operates with a normal high-water level of 472.5 feet above mean sea level. The water level is controlled through tank level telemetry.

The Pine Bush pump station, constructed in 1969 and located near Rensselaer Lake, pumps water to the western end of the City and the Guilderland service connection. The Pine Bush elevated tank is sited just off Karner Road at the end of Washington Avenue Extension and provides one million gallons of water storage for this section of the City. Normal operating high-water level of the tank is 470.5 feet above mean sea level. The single pedestal tank support provides a ground level storage enclosure for materials and equipment.

To improve pressure in the Upper Washington corridor, a pressure zone was created by constructing a 1-million-gallon standpipe at the W. Averell Harriman State Office Campus along with a 5 MGD booster pump station off of Colvin Avenue. The construction was completed in 2020.

The Office of General Services (OGS) transferred ownership of a 750,000-gallon concrete water tank (Harriman Grand Storage), a pump station (Harriman Pump Station), and 12-inch water mains to the Albany Water Board for adaptive re-use. The tank was cleaned and became operational in 2022. These facilities are part of the Upper Washington Pressure Zone.

2.8.1 Condition of the Water Pump Stations and Elevated Tanks

The pump stations and tanks are currently going through upgrades or have upgrades planned in the near future.

Upper Service Water District Pump Station

Electrical and Control upgrades including new VFDs and a new PLC were completed in 2022 and mechanical upgrades including new pumps, valves and piping were completed in 2024.

Photo 2-14. Upper Service Water District Pump Station Upgrades

Upper Service Water District Elevated Tank

In 2021, a connection was made to allow the Upper Service Water District to be supplied from the Latham Water District on an emergency basis. This has allowed the Upper Service Tank to be taken out of service for cleaning, inspection, and repair, and allowed the installation of new pumps in 2023. It will be used in the future when the repainting work on the Upper Service Water District elevated tank occurs.

Photo 2-15. Upper Service Water District Elevated Tank

Pine Bush Pump Station

In 2015, a system upgrade was completed at the Pine Bush Pump Station, including 3 new pumps with VFDs and controls. The HVAC system needs updating and is planned as part of future building upgrades. It is recommended that the size of the ventilation equipment be evaluated to determine if it is sized to properly ventilate the space. At a minimum, the louver actuators will need replacement, the ventilation equipment needs to be connected to the panel, and the ventilation system should be controlled via a thermostat or a controller. The HVAC upgrades are planned for 2025, funded through the EFC DWSRF 19157.

2.8.2 Recently Completed and Planned Projects

In 2013, the exterior of the Pine Bush elevated tank was painted. In 2013, a major system upgrade was completed at the Pine Bush Pump Station, including three new pumps and variable-speed drives. During 2016, divers entered both elevated tanks for inspections. Only minor cleaning of the sediment build-up was needed. The results of the inspections were encouraging as the tanks have not experienced any premature deterioration.

Upper Washington corridor pressure zone was created by constructing a 1-million-gallon standpipe at the W. Averell Harriman State Office Campus along with a 5 MGD booster pump station off of Colvin Avenue in 2020.

The Office of General Services (OGS) transferred ownership of a 750,000-gallon concrete water tank, a pump station, and 12-inch water mains to the Albany Water Board for adaptive re-use in 2022.

In 2022, repairs were made to the USWD Pump Station riser to patch portions of the riser that developed three leaks and showed signs of deterioration.

In 2023, the City awarded a contract to a company that specializes in underwater inspection of tanks and structures. They evaluated several AWD structures for cleanliness, structural condition, and coatings, and ranked the structures based on a score of 1 to 5. They performed inspections at the filtration plant, the Upper Service District elevated tank, the Pine Bush elevated tank, and the Harriman Campus tank. Work completed at Pine Bush tank included sediment removal, inspection, and the installation of a mixer to keep water circulating in the tank, they replaced the vent screen at the Harriman Campus tank, and the Upper Service tank work included a chemical wash and inspection. They also provided an estimate for repainting the Pine Bush Tank and the Upper Service Tank for future work.

Pine Bush HVAC upgrades and painting the Upper Service Elevated Tank will be financed through EFC DWSRF 19157. This financing is currently deferred as the AWB applies for WIIA and BIL in 2025. Upgrades to the Harriman water pump station are also planned for early 2025 but will be funded through the bonds of 2021.

The table below lists some of the site's most recent construction projects.

Table 2-6. Recent Improvements to the Stations and Tanks

Recent Improvements	Construction Date
Exterior painting of Pine Bush elevated tank	2013
Pine Bush Pump Station rehabilitation	2015
Upper Washington corridor standpipe and booster pump station	2019-2020
8-inch emergency connection constructed from the Upper Service to the Latham Water District.	2021
Upper Service Tank cleaned, inspected, and repaired	2021
750,000-gallon water tank, pump station and 12-inch mains transferred to AWB and put into service	2022
USWD Elevated Tank riser repairs	2022
Electrical and Control upgrades including new VFDs and a new PLC at the USWD Pump Station	2023
Pine Bush tank mixer for water circulation	2023

Mechanical upgrades to the USWD Pump Station - new pumps, valves, and piping	2024

Projects planned for 2025 are as follows:

- Pine Bush Pump Station building renovations including HVAC upgrades.
- Painting of the USWD Elevated Tank.
- Upgrades to Harriman water pump station.

Tables showing summaries of planned projects for the next five years is provided in Appendix A, Five Year Capital Improvement Program (2025-2029) Summary of Costs.

2.9 Finished Water Distribution

The distribution system, with approximately 376 miles of pipe, constitutes the oldest segment of the water system. Some of the smaller mains date to pre-1851 and are still in use. Feeder mains, ranging in size from 16 to 36 inches and encompassing a length of approximately 80 miles, carry water from the supply conduit to the smaller distribution mains. Roughly 180 miles of the distribution mains are 6 inches or less in diameter.

The EPA released the final Lead and Copper Rule Improvements (LCRI), which lowers the allowable lead limits in drinking water and sets a timeline for the replacement of all lead services. The final LCRI builds on the 1991 Lead and Copper Rule (LCR) and the 2021 Lead and Copper Rule Revisions (LCRR).

The LCRR required public water systems to provide an initial inventory of lead services by October 16, 2024, which is publicly accessible and provides information of known pipe material, and to notify customers within 30 days of the initial inventory. The LCRR also requires the public be notified of a lead exceedance within 24 hours of the exceedance. The AWD completed and submitted the initial inventory in compliance with the LCRR and has been complying with the additional requirements.

The LCRI compliance date is November 1, 2017, and includes the following elements:

- Baseline Inventory
- Lead Service Line Replacement
- Tap Sampling and Monitoring
- Public Education and Outreach

In anticipation of these new requirements the AWB proactively replaced some lead services. The Loudonville Reservoir will soon be dosing the treated water with liquid lime to increase pH and reduce corrosion in the water system. The AWD laboratory was Environmental Laboratory Accreditation Program (ELAP) certified for analysis of lead and copper in 2021. The City Code has been modified to eliminate partial replacements and spot repairs on lead services. Instead, a lead service needing repair must be replaced in full. The AWB offers two programs for residents. The first is a free Brita filtered pitcher for temporary mitigation of lead in drinking water. The second is a grant to reimburse the cost of lead service replacement up to $2,000. AWD operations staff have modified in-house policies for lead service

replacement in the street at no cost to the homeowner in emergencies. The AWD will continue to comply with the new rules and will replace customers' lead service lines on the required timeline.

The AWB was awarded EFC grants for lead service line inventory (DWSRF 19609 - $2,000,000) and lead service line replacement (DWSRF 19456 - $12,864,426). The inventory grant will be used to excavate curb box locations to confirm material and replace lead service lines that are discovered. The repair grant will be used for a more planned systematic replacement of lead services that have been identified.

2.9.1 Condition of Finished Water Distribution

There are approximately 8,700 valves and 3,000 fire hydrants in the distribution system. As with the distribution mains, the valves and hydrants are subject to a tuberculation, which results in the need for repair or replacement.

Table 2-7. Water Mains in Use

Size	Length (ft)	Size	Length (ft)	Size	Length (ft)
3”	300	**12”**	267,700	**30”**	29,050
4”	31,400	**16”**	51,300	**36”**	20,500
6”	947,200	**18”**	4,200	**42”**	7,700
8”	347,600	**20”**	71,250	**48”**	108,100
10”	12,200	**24”**	69,750	**60”**	600

*Approximate lengths derived from historic reports and Water System Atlas.

Table 2-8. Valves in Operations

Size	Type	No.	Size	Type	No.	Size	Type	No.	Size	Type	No.	Size	Type	No.
3”	Gate	30	**8”**	Gate	1000	**16”**	Cone	28	**20”**	Bfly	15	**30”**	Gate	21
4”	Gate	500	**10”**	Gate	50	**16”**	Ball	6	**24”**	Gate	30	**30”**	Cone	2
4”	Gate (hydrant)*	130	**12”**	Gate	660	**16”**	Bfly	20	**24”**	Cone	5	**36”**	Gate	35
6”	Gate	3160	**14”**	Gate	2	**20”**	Gate	70	**24”**	Ball	2	**36”**	Bfly	1
6”	Gate (hydrant)*	2860	**16”**	Gate	55	**20”**	Cone	1	**24”**	Bfly	30	**48”**	Gate	10

*Each system hydrant is protected by a gate valve installed on the hydrant branch piping. Quantities from historic reports and Water System Atlas

The system contains automatic control valves for the purpose of regulating the water pressure. The valves either reduce pressure or blow-off to relieve excessive pressure. Regular maintenance schedules have kept the valve units properly functioning.

2.9.2 Recently Completed and Planned Projects

Funds for water distribution system improvements have typically been directed to areas that are frequently repaired and areas that are scheduled for major street reconstruction projects by the City.

During 2015, $500,000 was allocated for water distribution upgrades. This was increased in 2016 to $700,000, with $400,00 dedicated solely to water main replacement. During 2016, there was a high-profile waterline break in South Lake Avenue at the intersection of Elberon Place. This break took place on the main 42-inch distribution line and collapsed a 60-inch combined sewer located next to the break. The repair of both pipes lasted for approximately two months.

In 2017, the Department began a construction project for the replacement of approximately 2325 linear feet of water main. This included 1850 linear feet of 16-inch ductile iron pipe on Hackett Boulevard from Samaritan Road to Holland Avenue, and 475 linear feet of 12” DIP on new Crown Terrace from Hackett Boulevard to the dead end. This project was expanded to include some additional areas, and this project was completed in 2018 for a total construction cost of $873,889.

In 2018, the AWB awarded a contract for the water main replacement and extension in Shaker Park. The main goal of this project is to improve fire flows. Project includes the replacement of approximately 800 feet of existing water main with 8” ductile iron pipe, the installation of an additional 800 feet of 8” ductile iron pipe, the installation of new valves and hydrants, and the installation of new water services to affected residents. Contract was awarded in 2018, construction was completed in 2019.

In 2018, the AWB received a grant in the amount of $516,565 for the replacement of lead services for Albany residents. These funds were used to replace 47 services in conjunction with the Ramsey Place green infrastructure project in 2019. The remaining funds were used to replace lead services in 2020 on Orange Street (19 services), Winnie Street (5 services), Briar Avenue (3 services), and Spring Street (10 services).

The Town of Colonie and the AWB entered into an intermunicipal water supply agreement in 2017 to construct an emergency interconnection between their water districts to allow for water supply to their customers in the event the water capacity is inadequate during emergency situations. Construction of this project began in 2019 and was completed in 2020.

For the Loudonville connection, approximately 4000 linear feet of 24-inch interconnecting pipes was installed. There are provisions for portable pumps having the capacity of 10 MGD to draw suction from reservoir piping conveying UV-treated water, and a flow meter. The agreed upon maximum amount of water that can be transferred from the AWB to the Town is 10 MGD, and from the Town to the AWB is 7.4 MGD.

The New Karner Road connection includes approximately 3500 linear feet of 16-inch interconnecting pipe. There are provisions for portable pumps having a capacity of 2,400 gal/min and for a flow meter. The agreed upon maximum amount that can be transferred from the AWB to the Town shall be 3.5 MGD, and 3.2 MGD from the Town to the AWB.

In 2020, AWD replaced approximately 2100 linear feet of distribution system piping. This included replacement made on Clara Barton Drive, Bethlehem Avenue, Briar Avenue, Princeton Drive, and Orange Street. A developer constructed and transferred ownership of new water mains for an apartment complex located on Sandidge Way.

In 2021, AWB replaced sections of 12-inch main and valves on Washington Avenue, near City Hall. Water main replacement was also completed on 3rd Avenue, Everett Road, Catherine Street, and Westerlo Street. A pressure relief valve for a New Scotland pressure zone was also added.

Replacement was completed for 3400 linear feet of 8-inch to 16-inch water mains located on Crescent Street, Commerce Street, and South Pearl Street. In addition, 720 linear feet of 6-inch diameter pipe were replaced with 8-inch diameter pipe on Lancaster Street from Lark Street to Dove Street.

In 2022, AWD began to undertake the purchase and installation of new telemetry for all of the pressure reducing valves and pressure relief valves in the water system. The valve vaults were cleaned and modified to allow for the installation of the new Trimble telemetry equipment, including installing taps, induction sump pumps, and antennae boxes. The telemetry utilizes utility power when available, and batteries when not available. While installing the new telemetry equipment, AWD has been replacing pressure relief valves as necessary. Valves were replaced at six locations, including New Scotland Avenue, McCormack Road, Eagle Street, McCarty Avenue, and Mount Hope Drive. Since 2012, all pressure relief valves have been replaced, and the only older PRVs remaining are PRVs 23 and 24 in the Shaker Park Area. The next phase will be to install utility power to locations that are currently using batteries.

The AWD conducted a pilot study using an innovative leak detection system by Aquarius Spectrum. The advantage of this type of system is that it is continuously monitoring, and AWD will be able to find leaks while they are small and prioritize inspections and repairs based on daily monitoring of suspected leak locations. They AWB is interested in installing a fixed real time leak detection system starting with the downtown area and has requested funding in EFC DWSRF 19554.

In addition, the AWD repaired or replaced over 77 valves and performed leak detection for 476 City blocks. There were 25 leaks detected and repaired as a result of the leak detection work.

In 2023, AWD utilized $500,000 of American Rescue Plan Act funding and some additional fund reserves for replacement of 35 lead service lines on streets undergoing paving projects. Approximately 500 lead service lines are expected to be replaced by the end of the year through capital improvement projects, private replacements under the grant program, and in-house AWD replacement work. AWD developed a comprehensive plan for lead service line replacement and applied for available funding through EFC and under the Bipartisan Infrastructure Law grant program. Lead service line replacement will continue in 2024, with a goal of 1000 replacements.

In addition, approximately 655-feet of 8-inch HDPE pipe was replaced on Krumkill Road, responded to and repaired 55 water main breaks, and rebuilt or replaced 171 valves. They also completed 48.3 miles of leak detection, through which 15 leaks were detected and repaired.

The AWB developed a water main improvement report for the Drinking Water State Revolving Fund Intended Use Plan submission for fiscal year 2024. The report detailed the capital improvements needed for the water transmission and distributions system in the City of Albany, some of which were installed in the 1800s.

The projects listed include replacement of around 11,700 linear feet of existing water mains across the City of Albany, ranging in size from 6-inch to 42-inches in diameter. The project will also include installing utility power to telemetry that is currently powered with batteries.

The estimated cost to be used by the Albany Municipal Water Finance Authority for a Bond Resolution is estimated to be around $12 million. The AWB has an application for funding for $7,628,722 in Drinking Water State Revolving Fund (DWSRF 19554) financing for water meter replacement. The funding will proceed in 2025.

AWD plans to initiate a new pilot for continuous leak detection in 2025 with a company called 64 Seconds. This will include the installation of 100 leak detection units on hydrants on Central Avenue for continuous leak detection with a goal of pinpointing the locations of water loss. The benefit of this technology over the pilot conducted in 2022, is that the devices can be easily moved to new locations and are a tenth of the cost. However, data from these devices must be collected by Bluetooth by driving past the hydrants, versus being integrated into a proprietary web-based platform. They are less durable than the more costly option and are prone to vandalism. The AWD may decide to use a combination of these technologies in the future.

The table below lists some of the site’s most recent construction projects.

Table 2-9. Recent Improvements to the Finished Water Distribution

Recent Improvements	Construction Date
Rebuilt Pressure Regulating Valves	Multiple Years
Additional Telemetry to Feura Bush	2002
PRV 8 replaced	2012
Conversion of PRV telemetry from radio to cellular	2015
Emergency repair of the 42" water main	2016
Hackett Boulevard and Crown Terrace Water Main Replacement. PRV 11 and 12 Replaced.	2017 and 2018
Shaker Park watermain replacement	2019
Town of Colonie Emergency Interconnections	2020
New Scotland pressure zone pressure relief valve, and new pressure relief valve and vault at both Eagle Street and McCormick Road	2021
Water Main Replacement along Crescent, Commerce, South Pearl, Lancaster, and Osborne Streets	2022
PRV Replacement (1,2,3,4,6,7,9,14,15,16,17,18,19,20,21,22, and 25)	2020-2023
Replaced Pressure reducing valve and pressure relief valve replacement	Yearly
Installation of Trimble telemetry at pressure reducing valves	2022/2023
Pressure reducing valve and pressure relief valve replacement	Yearly
Lead service line replacement	Yearly
Watermain replacement	Yearly

Projects planned for 2025:

- Continue a systematic hydrant testing and leak detection program
- Continue lead service replacement and grant program
- Continue valve cleaning, exercising, and replacement
- Water main replacement

Tables showing summaries of planned projects for the next five years is provided in Appendix A, Five Year Capital Improvement Program (2025-2029) Summary of Costs.

2.10 Service Connections

The Water System supplies water to the City, which had a reported population of 98,251 in 2017. Water service is provided to approximately 28,000 accounts. The Water System is the sole source of water for consumption and fire protection in the City. Average daily water demand within the City peaked in the late 1950's and early 1960's at approximately 25 MGD. Average demand remained steady through the late 1960's and early 1970's despite slight declines in the City's population. Largely as a result of conservation measures, and a leak detection and repair program undertaken in the early 1980's, daily demand within the City was reduced. The City continues to have an aggressive leak detection program and has a dedicated leak detection team. In 2023, the daily demand averaged approximately 17 MGD.

2.10.1 Municipal Connections

In addition to supplying water to residents and businesses located in the City, the System also supplies treated water to the CSX Rail Yard at Selkirk, and supplemental quantities of treated water to the Town of Bethlehem and the Town of Guilderland. Untreated water from the Alcove Reservoir is released to the Hannacroix Creek, the Village of Ravena, and surrounding hamlets that are within the Village service area.

2.10.1.1 Contract with the Town of Bethlehem

The AWB's contract with the Town of Bethlehem provides that the AWB will supply treated water to the Town of Bethlehem at certain contractual billing rates. This agreement allows the Town to comply with their water supply permit (WSA 10824), which states they have up to 2.5 MGD available to them through the interconnection with the City of Albany.

The contract expired in 2023, and the Town entered into a new agreement with the AWB in 2024. Under this new agreement the Town is paying City of Albany customer rates including Tier I and Tier II customers. .

2.10.1.2 Contract with the Town of Guilderland

The AWB entered into a contract with the Town of Guilderland in 2018, which provided that the AWB would supply up 70 million gallons a year, up to 2,000,000 gallons per day of treated water to Guilderland to supplement its water supply. Guilderland agreed to pay the AWB at the beginning of each year for the 70 MG to be provided by AWB over the course of the year. In 2024, the contract was amended to provide 35 million gallons a year. The Town of Guilderland’s greatest demand for Albany water comes in July and August of each year.

2.10.1.3 Contract with the Village of Ravena.

Under original 1927 approval of acquisition of source of water supply by the NYSDEC, the AWB is required to, upon request and at no cost, release up to 2,000,000 gallons of untreated water per day from the Alcove Reservoir for supply to the Village of Ravena. Under this contract, the Village of Ravena has requested approximately 1,000,000 gallons of untreated water per day, historically.

2.10.1.4 Contract with the Town of Colonie

The Town of Colonie and the AWB entered into an intermunicipal water supply agreement in 2017 to construct an emergency interconnection between their water districts to allow for water supply to their customers in the event the water capacity is inadequate during emergency situations.

The AWB entered into a contract with the Town of Colonie in 2018, which provided that the AWB would supply up to 10 MGD; or receive 7.4 MGD from the Town of Colonie via the Loudonville Interconnection. The AWB also would supply 3.2 MGD to or receive 3.5 MGD from the Town of Colonie via the New Karner Road interconnection. In the event that there is a need for either party to provide “Emergency Water” then the payment for said water shall be determined by the formulas stated in the Intermunicipal water supply agreement.

The cost of the Loudonville Interconnection was approximately $1,960,000, and the New Karner Road Interconnection $1,210,000. The Town and AWB agreed to pay 50% of the construction and maintenance cost associate of these interconnections. Construction was completed in 2020. In 2021, a new water main was installed to allow feeding the Upper Service from the Town of Colonie. The Latham Water District successfully used the Loudonville Interconnection in 2023, and the New Karner Road Interconnection in 2024. AWD has used the Loudonville Interconnection multiple times, but has not yet used the new Karner Road location, except to test.

2.11 Albany Water Department Office - (10 North Enterprise Drive)

The Department of Water and Water Supply headquarters for operations is located at 10 North Enterprise Drive. This location has offices, a garage, and a customer service area. The Department moved in 2010 from the former location at 35 Erie Boulevard. Space and systems renovations were made in an attempt to make the North Enterprise building more functional; however, there are some current space use and systems controls problems that seem to make the building awkward and inefficient for the spectrum of programming in its current state. In addition, the Department anticipates upcoming space needs and increases in total personnel, and the building will not accommodate projected needs.

In 2016, a consultant performed a feasibility and space planning analysis of the Department of Water and Water Supply facility at 10 North Enterprise Drive. This study included an examination of existing utilization of the facility and identified potential solutions to improve efficiency, workflow and communication amongst members of the Department; suggested renovations that would improve and make more secure the functions and communications between the Department, customers and the general public; and provided diagrammatic solutions for improved physical layout of the building. The results of the study presented several alternatives for updating the building to better serve the Department’s needs.

The 35 Erie Boulevard property is still owned by the AWB and is utilized for staging of material and equipment.

In 2018, the AWD awarded a contract to an architectural firm for renovation design and plans for utilization for both the 35 Erie Boulevard and 10 North Enterprise Drive locations. The plans called for the demolition of the current building at 35 Erie Boulevard and construction of a new structure to better suit AWD current needs of staging and storage. The design included general site improvements to help

streamline operations and transportation of materials on and off site as well as modifications to 10 North Enterprise Drive to improve the administration area, garage, and inventory area. These improvements will improve the functionality, security, and safety of the facility.

In 2020, AWB awarded a contract for SHPO consultation and SEQRA compliance for the proposed demolition at 35 Erie Boulevard and awarded a contract for architectural and engineering services for a new building and site improvements at this location. The demolition of the Erie Boulevard building was completed in 2021, and a new building constructed in 2022.

In 2022, new electric vehicle charging stations were installed, as well as new cameras as part of a system-wide security upgrade.

In 2024, Traffic Engineering moved out of the building, which made some of the office and garage space available. Some new space at 35 Erie Boulevard will be used for office space. (new buildings were constructed, facilities manager office will be there, contractors yard, sheds. Desk space.

2.12 Miscellaneous Engineering

Miscellaneous engineering is an account to pay for consulting engineering services. It may be used for surveying, mapping, inspections, or other work to assist the AWB in its operations. It is also used for monthly consultations and capital program monitoring services.

2.13 Meters and Computers

This account is for improvements and upgrades to computer, meters, and AWD software.

A contract was awarded for computer maintenance management software (CMMS) in 2018. Utility Cloud, a cloud-based CMMS system deployment was initiated in 2019 and is expanded upon each year. The program is currently used for logging customer calls, scheduling and tracking work, and permits. More specifically the following is included:

- Logging customer calls
- Development and tracking of work orders
- Sewer and water investigations and repairs
- Manhole and catch basin rebuilds
- Water service, hydrant, valve, and water main repairs and replacement
- Hydrant painting and flushing
- Preventative maintenance and response
- Camera inspection scheduling and tracking
- Dig Safe New York tickets
- Restoration tracking

In 2021 the AWB completed a project to develop an online GIS application that syncs with Utility Cloud. Reporting is completed through Power BI.

In 2022, the AWB upgraded the Azure servers and stopped utilizing SkyTerra for cloud management services. These upgrades allow AWB more control of their data collection and maintenance.

In 2022, the Feura Bush Filtration Plant operations transitioned to SharePoint to store data. They also began the transition to collecting data and track processes via tablets. In 2023, operations transitioned fully to collecting data using the tablets and Share Point lists.

The table below lists some of the recent projects.

Table 2-10. Recent Projects for Meters and Computers

Recent Improvements	Completion Date
Upgraded Geographic Information System (GIS) licensing with ESRI to include more desktop licenses and ArcGIS Online capabilities	2016
Migration to Orion radio read meters is more than 98% complete	2017
Conversion of the large users to an advanced metering system using cellular communications	2017
Water system SCADA Improvements	2018
Utility Cloud Software Deployment	2019-Continue
Azure Server Upgrade	2022

The following is planned for 2025:

- Various system-wide security improvements

Projects that have been identified, but not yet scheduled:

- Track water metering in Utility Cloud, including usage, service work, and historical records.

Tables showing summaries of planned projects for the next five years is provided in Appendix A, Five Year Capital Improvement Program (2025-2029) Summary of Costs.

3 ALBANY SEWER SYSTEM

The Albany County Sewer District, now renamed the Albany County Water Purification District (ACWPD), was formed in 1967 and the City signed an agreement for ACWPD participation on December 3, 1970. Under the agreement, the City was responsible for operating and maintaining the collection system within its boundaries. The sewer system connects with the ACWPD facilities at the Hudson River Interceptor and the Patroons Creek Trunk Sewer, both of which are maintained and operated by ACWPD. The ACWPD operates the overflow regulators, which control the amount of sewage bypassed to the Hudson River during storms and owns and operates two (North and South) treatment plants, which treat sewage from the sewer system as well as the other municipalities in ACWPD.

The sewer system is divided into eight sewer districts within the corporate boundaries of the City. ACWPD's North Plant treats sewage from three of the sewer districts, which had an average daily flow of 4.6 MGD in 2023, and the ACWPD's South Plant treats sewage from the remaining five districts, with an average daily flow of 23.4 MGD in 2023.Through October 2024 the flow through the South Plant averaged 19.6 MGD. The effluent flow meter was calibrated early in the year, and it was a dry summer and fall.

The Patroons Creek Trunk Sewer and the Hudson River Interceptor South are the two main conveyance facilities, which connect with the collection and trunk sewers of the Sewer System. The Patroons Creek Trunk Sewer was constructed between 1969 and 1974 by ACWPD. The ACWPD monitors flow in this trunk sewer through the use of remote flow metering stations.

The Hudson River Interceptor South is maintained and operated by ACWPD. The sewer system connects to the interceptor through eight small collector sewers and 21 trunk sewer connections. Each of the 21 trunk sewer connections has an intercepting manhole and flow regulator to control the flow of sewage to the interceptor and to provide for the diversion of excessive flows to the Hudson River.

The sewer system includes approximately 900 miles of sanitary, storm, and combined sewers. Recent sewer system improvements include the completion of six phases of the Beaver Creek Sewer District Improvements, which have substantially mitigated street flooding and sewer backup problems in the largest of the City's districts. These improvements are designed to store storm water and combined sewage at various points throughout the sewer system to mitigate street flooding and the occurrence of combined sewage overflows. The AWB is responsible for maintaining these projects going forward.

In 2020, a new Harriman Sewage Pump Station was completed and placed in service. This pump station diverts wastewater from the University of Albany and the W. Averell Harriman State Office Campus to the ACWPD Patroons Creek trunk and North Plant. This wastewater flow previously contributed to the Beaver Creek Combined Sewer District.

3.1 Albany Pool CSO Long Term Control Plan

NYSDEC issued an Order on Consent which required six communities (Albany, Troy, Rensselaer, Cohoes, Green Island, and Watervliet) to facilitate the implementation of the Albany Pool CSO Long Term Control Plan (LTCP). The LTCP was created to study the current health of the Hudson River, identify

programs and projects that will aid in the clean-up of the river, and demonstrate the effectiveness of the program. In 2015, the six communities signed an intermunicipal agreement that guide the shared implementation of programs and projects. The Capital District Regional Planning Commission acts as administrator for the contract. The communities also established a Local Development Corporation, named the Albany CSO Pool Communities Corporation. This is a not-for-profit corporation tasked with keeping track of compliance with the Order of Consent and the financial contributions for each community for LTCP projects.

Working with the NYSDEC, the communities will implement more than 50 projects and programs that will significantly improve the water quality of the Hudson River and its tributaries. The program will be completed in 2027.

Each of the communities shall pay its percentage share, as determined by an Allocation Formula established during the development of the LTCP, of the total costs of the projects less any grants received. The costs for projects as identified in the approved LTCP are estimates and subject to change upon project design and implementation. Adjustments to each community's required payment, to account for actual costs, will be made based on the Allocation formula. The LTCP project costs will include all costs, as required to implement the LTCP, of planning, design, procurement, permitting, administration, implementation, and post-construction inspection and approval. Costs of management, operation and maintenance of facilities and equipment are LTCP project costs if such activities are within the purview of the LTCP.

The Allocation Formula is weighted 85% by total CSO flow from each Community, and 15% by population of each Community, based on the 2010 Census. Each Party's percentage share of LTCP project costs is as follows: Albany - 58.68%; Cohoes - 2.74%; Green Island - 0.53%; Rensselaer - 2.13%; Troy - 34.76%; Watervliet - 1.16%.

Over the life of the program more than $136 million will be invested; $100 million of which will be invested by the communities and $36 million by the sewer districts. The working group for the Albany Pool Communities developed a financial plan that has been approved in concept by all of the participants. The fifteen-year Capital Improvement Plan, developed by the Albany Pool Joint Venture Team, outlines all of the construction costs plus contingencies for each year. The allocated annual costs, plus administrative expenses, have been allocated to the participants based on their percentage share of the overall costs.

The AWB plans on meeting their financial obligation through funding from the EFC Clean Water Act State Revolving Fund (CWSRF).

AWB's first three-year (2015-2017) tranche (was applied for through the EFC CWSRF in early 2015 and the application for funding was approved (CY-5402-14-00). The AWB share of the approved funds included $5,616,817 in 0% interest long-term financing. AWB local share was $247,144. The grant amount remaining when the loan was converted from short-term to long-term financing was $1,284,999.

In 2017, the Albany Municipal Water Finance Authority (AMWFA) applied for a New York State Intermunicipal Water Infrastructure Grant on behalf of the Albany CSO Pool Communities for the Beaver Creek Clean River Disinfection and Floatables Control Project (previously Big C Regulator Screening and Disinfection project). The State of New York awarded a $10 million-dollar IMG grant for the project, of

which $5,868,000 (58.68%) is Albany's share. AMWFA also received a $5 million WQIP grant for this project of which $2,934,000 (58.68%) benefited Albany.

The project includes a 100 MGD satellite treatment facility, improvement to screening at the ACWPD South Plant, two diversion tunnels, and a new connection to the Hudson River interceptor. The total project cost is 54,995,000, AWB has also been granted long term financing for this project through EFC CWSRF (CY-5402-14-02). AWB share of the project is $23,469,000.

AWB applied for Flood Mitigation funding through EFC for the Elberon Place and Hansen/Ryckman projects described in the next section. The AWB was approved for $2,887,500 in grants and $3,962,500 in Long Term Financing.

Mereline Green Infrastructure Project (C4-5402-14-03) AWB received a grant for $500,000 to supplement the cost of this sewer separation and porous pavement project.

The final tranche of LTCP (CY-5402-14-04) is for five years (2023-2027). Projects include eliminating the Liberty and Schuyler CSO overflows in Albany, the Little C floatables project and Manor Avenue Sewer Separation in Cohoes, and the Cross Street Phase II project in Troy. The total estimated cost for these projects is $8,509,000 of which $2,127,250 will be funded through a WIIA grant, $4,254,500 through BIL funding, and $2,127,250 will be financed at 0% interest.

In 2025, the short-term financing C4-5402-14-01 and C4-5402-14-03 will be converted to long-term financing. AWB received a WIIA grant for $2,501,969 and $4,998,575 will be financed at 0% interest. In addition, C4-5402-14-02 for the Beaver Creek project will be converted to long-term financing. AWB received $3,971,960 IMG grant funding and $24,239,296 will be financed.

The AWB will continue to participate in EFC's CWSRF program for the duration of the Capital Improvement Plan.

3.2 Sewer System Areas

The recent upgrades and maintenance to the approximately 900 miles of sanitary, storm, and combined sewers currently serving the City of Albany has been focused on two areas of improvement. The first has been sewer separation and flood mitigation projects. The goals of these projects are to either separate the storm water flow from the combined sewer, or to provide stormwater storage and retention. The second area improvement has been the rehabilitation of the existing sewer pipes based on their condition.

3.2.1 Sewer Separation and Satellite Treatment

A description of some of the improvements made to the combined sewer system in compliance with the Long-Term Control Plan are provided below.

- Mariette Place Green Infrastructure Project – This project was implemented to remove flow to the combined sewer system. It included four new bioretention areas, 600 feet of new stormwater collection pipe, and a new 15" outfall pipe, discharging to a tributary of the Normans Kill.
- Satellite Treatment Floatables Control Facilities for the Maiden Lane, Steuben St., Orange St., Quackenbush Square, Jackson/Livingston regulators - These facilities collect floatables from the

combined sewer overflows (CSOs) in the vicinity of the Corning Preserve. They screen, separate and trap debris and sediment that would otherwise flow to the Hudson River. The facilities at Orange St, Quackenbush Square, and Jackson/Livingston are equipped with sewage pump stations.

- Quail Street and Elberon Place CSO Abatement and Flood Mitigation Project - There has been a history of flash flooding and system surcharging issues occurring within the Quail Street neighborhood along Elberon Place. There is a clearly defined low-lying area in the topography within this flood zone that can become inundated during precipitation events resulting in flash flooding. Quail Street CSO abatement and flood mitigation is part of the LTCP, the Elberon Place CSO abatement and flood mitigation is not.
- Under Phase 1 of the project, green infrastructure practices were implemented as part of the "Quail Street Green Infrastructure Project". The City constructed infiltration cells or galleries along the linear street corridor (under the sidewalks) to intercept stormwater and promote maximum infiltration to reduce the runoff volume and flow rates conveyed to the combined sewer system. Runoff enters the infiltration cells via porous buffer strips along the sidewalks, tree and planting areas, and through interceptor structures in the street which provide for pre-treatment of flows to capture heavy grit and sediment, along with other pollutants and floatable materials. In addition, passive controls were constructed in the system to manage flows and maximize infiltration within the cells.
- In Phase 2, a 5-foot diameter storm sewer was extended from Quail Street to Washington Park Lake, along Elberon Place, and an outlet control system was installed for continuous monitoring and adaptive control of lake level. This component of the overall project was not part of the LTCP.
- North Swan Street Green Infrastructure Project – Included the reduction of impervious surfaces by approximately 25% to promote natural filtration for improved quality of stormwater runoff. Green Initiatives within the North Swan Street Park redevelopment design included permeable pavers, bioretention, soil restoration and decompaction, vegetated swales and tree plantings.
- Mereline Green Infrastructure Project - Installation of porous pavement and underdrain system to divert local drainage from the combined sewer to a tributary of the Normans Kill.
- Beaver Creek Clean River Project – This project includes sewer improvements and the construction of a satellite floatables control and disinfection facility to reduce fecal coliform discharges to the Hudson River with a goal of treating additional 285 million gallons on an average annual basis This project is being completed in five phases, which are outlined below.
    - Phase 1 – Third Avenue Improvements – A new connection to the ACWPD Hudson River Interceptor, which will prioritize transport of screenings from the new satellite treatment facility to the South Plant.
    - Phase 2 – ACWPD South Plant Screening Upgrades - Three new screens, conveyor and washer compactor.
    - Phase 2a – New throttling gate at the influent manhole to the pretreatment building has been delayed due to availability of motor operator equipment.

  - Phase 3 – Beaver Creek Diversion Tunnel – Divert flow upstream at Delaware Avenue to the new satellite treatment facility.
  - Phase 4 – Third Avenue Tunnel – Divert flow from the satellite treatment facility to Third Avenue to carry screenings.
  - Phase 5 – Beaver Creek Clean River Disinfection and Floatables Control Facility (previously Big C Disinfection & Floatables Control) - The proposed satellite treatment facility will provide screening for flows up to 120 MGD to remove floatables and disinfection of up to 100 MGD, reducing microbiological load (2-log enterococci reduction) to the Hudson River.

- Bouck Regulator – This regulator is located at the intersection of Bouck Street and South Pearl Street in the Island Creek Sewer District. The overflow from the regulator is adjacent to Island Creek Park, a fishing and recreation area. On May 8, 2018, a dry weather overflow to the Hudson River was observed and reported to the NYSDEC, and the pipe to the Albany County interceptor was discovered to be failing. There was already a defined scope of work for upgrades to this regulator in the CSO Long Term Control Plan, but the upgrades were not scheduled for several years. AWB decided to move the scheduled project forward, through an emergency repair. This eliminated the dry weather overflow incidents and the work resulted in an improved and larger 30-inch connection to the County Interceptor, greatly reducing the occurrence of overflows.

- Additional projects completed or are being completed to help reduce the potential for flooding in the City that are not Long-Term Control Plan projects are provided below.

- Hansen/Ryckman CSO Abatement and Flood Mitigation Project - Hansen Alley is located within a residential area of the City of Albany, located between Hansen Avenue and Woodlawn Avenue. Hansen Alley is located in a low-lying region of the neighborhood and a large amount of localized stormwater runoff is conveyed to the area via overland flow. This project includes a series of underground chambers and an associated outlet control structure to mitigate captured runoff and provide a controlled release of the runoff back into the existing combined sewer system.

  Ryckman Alley is located within a residential area of the City of Albany, located between Ridgefield Street and Ryckman Avenue. Topographically, Ryckman Alley is located in a low-lying region of the neighborhood and a large amount of localized rainfall (or runoff) is conveyed to the area via overland flow. For this project, engineered wetlands and an associated outlet control structure mitigate captured stormwater runoff and provide a controlled release of the flows back into the combined sewer system.

- Phase 2 of the Quail Street Green Infrastructure Project - A dedicated storm sewer line constructed along Elberon Place provides conveyance of runoff from Quail Street and Elberon Place to the Washington Park Lake. Conveyance of flows to the lake provide for the "free drainage" of the low-lying area on Elberon Place and serve to re-establish natural floodplain storage which previously existed along Beaver Creek.

- Beaver Creek Phase 6 Combined Sewer Overflow Abatement improves the Beaver Creek system and helps mitigate flooding. Beaver Creek sewer construction Phases 1-5 was previously completed in the late 1990’s. Beaver Creek Phase 6 converted Beaver Creek Phase 1 from detention storage of combined sewage to separated stormwater storage. Albany High School stormwater drainage now connects directly to Beaver Creek Phase 1 and is stored as separated

stormwater. Albany High School installed additional stormwater detention as part of their improvements. Opti Adaptive Controls have been installed on Albany High School stormwater detention and connecting this detention to separated Beaver Creek Phase 1 sewers. Additionally, Beaver Creek Phase 2 (North Main) and Beaver Creek Phase 3 (West Lawrence) have been disconnected from the trunk sewer by installing a 42" HDPE pipe from North Main to the Albany High School detention. Beaver Creek Phases 1-3 and Albany High School detention along with Opti Adaptive Controls provides an additional 1.9 million gallons of stormwater storage within the Beaver Creek drainage area.

- Hackett Boulevard and Sheridan Avenue green infrastructure projects will address current flooding conditions in the combined sewer system in those areas. Constructed wetlands on Academy Road will be the first phase of the work completed on Hackett Boulevard.

  The Sheridan Avenue green infrastructure improvements will begin with the North Hawk and Orange Street Porous Basketball Court and Stormwater Management Project. As part of a neighborhood-scale stormwater solution to mitigate CSOs and on-street flooding on Sheridan Avenue and lower Orange Street, AWB has coordinated with Habitat for Humanity, the Mayor's Office, and City of Albany Department of Recreation to install separated storm sewers on Orange Street between North Swan Street and North Hawk Street, install bioretention areas with large trees, and rehabilitate the existing basketball court at 127 Orange Street.

  The basketball court property will be regraded to direct stormwater to the new porous court surface and sub-surface stormwater management system. The property will be outfitted with amenities such as terraced stadium seating, bioretention areas, retaining walls, and new landscaping. The stormwater system outlet will be controlled by an actuated valve that features real-time controls to predict storm events and release/store stormwater according to precipitation events.

- Ramsey Place Green Infrastructure Project is a green infrastructure and storm sewer separation project that includes impervious surface reduction, the installation of separated storm sewers, an underground stone reservoir, and tree pits on Ramsey Place, and porous pavement to mitigate flooding on Hackett Boulevard and combined sewer overflows.

- Hansen Alley Overflow Abatement and Flood Mitigation Project - Installation of pump station and irrigation system to utilize the existing 750,000 gallons of separate stormwater storage underneath Woodlawn Park baseball field.

- Arch Street Relief Sewer – Mitigate sewer surcharge due to heavy rain events at the intersection of Arch Street and South Pearl Street. The Arch Street relief sewer is an AWB trunk sewer that was put into use for the Empire State Plaza cooling water discharge in the 1960s. A new connection was made to re-establish this trunk as a relief sewer for the Beaver Creek trunk.

- Flood Mitigation in the Melrose Area - AWB has developed a plan to begin systematically remove catch basins from the combined sewer system in this area that is prone to flooding. They will replace traditional catch basins with green infrastructure practices and/or replace the traditional asphalt road with porous pavement. Streets planned for work in the next five years includes Homestead Avenue, Terrace Avenue, Fairlawn Avenue, and Hawthorne Avenue.

3.2.2 Recently Completed and Planned Projects

The design of satellite treatment floatable facilities for the Maiden Lane, Steuben St, Orange St, Quackenbush Square, and Jackson/Livingston regulating structures was completed in 2017. The floatables facilities collect floatable debris and materials associated with CSOs from the regulator structures. The construction of the floatables facilities began in 2018 and was completed in 2019.

There was a Phase 3 Archaeological survey completed at the locations for the Jackson/Livingston regulators. The field work for the Archaeological survey was completed in November 2018. Artefacts were collected, cleaned, and the findings documented. The final Archaeology report was completed. A final curator for the artifacts still needs to be determined. Currently, the artifacts are being held by the archeological consultant.

Beaver Creek Clean River Project – The Third Avenue Improvements, Beaver Creek Diversion Tunnel, Albany South Treatment Plan Improvements, and the Third Avenue Tunnel have been completed. The construction of the Beaver Creek Clean River Disinfection & Floatables Control facility began in 2021. It was operational as of September 26, 2024.

The Lincoln Park Learning Garden is the final phase in the Beaver Creek Clean River Project. The project includes the construction of a public garden adjacent to the existing Lincoln Park. Unused space owned by the City will be transformed into an interactive outdoor learning space complete with a learning garden, outdoor classroom, and nature inspired playgrounds.

Mereline Green Infrastructure Project - Construction began in 2019 and was completed in 2020. A $500,000 grant was received for this work.

Hackett Boulevard and Sheridan Avenue Green Infrastructure – Heavy debris was removed from the Sheridan Avenue Fox Creek sewer in 2019, a new manhole structure was installed in the First Church parking lot, and masonry repairs were made to the sewer. A one-million dollar Water Quality Improvement Act grant was executed in 2019 for the planned green infrastructure improvements on Hackett Boulevard. In 2024, completed modifications to an existing stormwater detention pond on an easement from the Congregation of Beth Emeth. The AWD enlarged the size of the stormwater detention basin with constructed wetlands on the lower areas of the basin on Academy Road. Opti controls were integrated to control the water elevation in the detention basin. This project is anticipated to be operational by the end of 2024, and fully completed in 2025.

Thurlow Terrace sewer separation project is planned for 2025. The project includes the construction of a separate storm sewer, which will discharge to Washington Park Lake. The lake has an outlet control system with continuous monitoring and adaptive control of lake level used to discharge stormwater back to the combined sewer off peak precipitation events.

The Albany Water Board is implementing a Green Infrastructure In-Lieu Fee and Credit Banking and Trading program. This program includes the construction of stormwater management practices, both traditional and green, along Hackett Boulevard. Grant funding was used to fund the In-Lieu Fee and Credit Banking study ($300,000).

Additional Hackett Boulevard storm sewer improvements are proceeding using C4-5402-17-00 funds. The total project anticipated cost for these improvements is $5,310,000. AWB received a $700,000 WQIP grant, $1,250,000 GIGP grant, $840,000 WIIA grant, and $1,680,000 in BIL funding for this work.

Ramsey Place Green Infrastructure Project –This project was completed in 2019.

Hansen Alley Overflow Abatement and Flood Mitigation Project – AWD purchased the pump station and filtration system equipment and contracted installation. The stormwater used to irrigate the Babe Ruth Ballfield. This project was completed in 2020.

Mariette Place – In 2019 sewer cleaning and inspection was completed, and AWB completed rehabilitation of 1000 ft of sewer in 2020.

Beaver Creek Phase 6 Combined Sewer Overflow Abatement – Project was completed in 2020.

AWD awarded a contract in 2019 for a Stormwater Modeling and Flood Mitigation Study for the Melrose, Western, Marion Avenue Segment of the Beaver Creek Pump Station. The goal of this project is to model a low lying are of the City that is prone to flooding and evaluate alternatives to reduce the frequency and impact. The project was completed in April 2020 with several alternatives for potential flood mitigation projects.

Replaced brick and slate combined sewer with new separated sanitary and storm sewers on Westerlo Street from Trinity Place to South Pearl Street in 2021 to help mitigate flooding. Flood Mitigation in the Melrose Area – In 2021, traditional pavement along the curblines was replaced with porous pavement on Hawthorne Street from Belvidere Avenue to Melrose Avenue. In 2024, a bioretention area with tree plantings was constructed in the center median of Brevator Street between Western and Washington Avenue. Perforated pipe under the bioretention area allows stormwater to infiltrate into the ground and overflow is directed to the separate storm sewer.

North Hawk and Orange Street Porous Basketball Court and Stormwater Management Project construction is planned to begin in 2025/2026. The feasibility study is currently being updated and additional soil investigations are planned. This project will be funded by the EFC Green Innovation Grant Program, Habitat for Humanity, and a local share from AWB and Department of Recreation.

Table 3-1. Recent Projects for Sewer Separation

Recent Improvements	Completion Date
Ground water recharge basins were constructed in the Melrose/Winthrop Avenue Area and Upper Washington Avenue Area	2014
North Swan Street Green Infrastructure Project	2014
Quail Street Green Infrastructure Project	2016
Elberon Place Drainage Project	2017
Mariette Place Stormwater Project	2017
Hansen and Ryckman Drainage Project	2017
Floatables Control Facilities - Maiden Lane and Steuben Street	2018
Phase 2 of the Sewer Automation and Data Collection System.	2018
Beaver Creek Phase 6 Combined Sewer Overflow Abatement	2019

Recent Improvements	Completion Date
Ramsey Place Green Infrastructure Project	2019
Floatable facilities for the Maiden Lane, Steuben St, Orange St, Quackenbush Square, and Jackson/Livingston regulating structures	2019
Hansen Alley Overflow Abatement	2020
Mereline Green Infrastructure Project	2020
Hawthorne Avenue porous pavement Street separated storm sewer.	2021
Westerlo Street separated sanitary and storm sewers	2021
Arch Street surcharge mitigation	2021
Third Avenue Improvements, Third Avenue Tunnel, Beaver Creek Diversion Tunnel	2022
Albany South Treatment Plant Improvements	2024
Brevator Street Bioretention Area	2024
Academy Road Constructed Wetlands	2024

The following projects are planned for 2025:

- Stormwater retention improvements on Hackett Boulevard.
- North Hawk and Orange Street stormwater management project.
- Thurlow Terrace sewer separation.

Tables showing summaries of planned projects for the next five years is provided in Appendix A, Five Year Capital Improvement Program (2025-2028) Summary of Costs.

3.2.3 Sewer Rehabilitation and Upgrades

The AWD is proactive in the inspection and preventative maintenance of sewer pipes. AWD crews perform jet-vac cleaning and video inspection of small diameter sewers to identify sewer lines in need of maintenance. Contracts are awarded for the inspection and condition assessment of large diameter sewers. Large diameter sewers are inspected by either walking from manhole to manhole, while equipped with lights and a video camera, or specialty floats and crawlers are used carry the camera through the pipe.

Each year a significant portion of the budget is allocated to the rehabilitation of sewers through the installation of cured-in-place pipe (CIPP). In 2017, nineteen small diameter segments of pipe were identified for CIPP. These nineteen segments total approximately 5,290 feet in length and include 12-inch, 15-inch and 18-inch diameter pipes.

Three segments of pipe totaling 1075 linear feet, and one alternate 89 linear foot segment of pipe, were lined in 2018. The segments are located on four streets on one segment of the Beaver Creek Trunk sewer including Park Avenue, South Lake Avenue, Myrtle Avenue, and Warren Street. In 2019, approximately 15,000 linear feet of small diameter sewer was lined throughout the City.

Historically, the State University of New York (SUNY) Alumni Quad had flooded during heavy rain events as stormwater was unable to discharge to the combined sewer at full capacity. In 2018, SUNY Albany separated sanitary and storm sewers on campus and the stormwater was redirected to Western Avenue storm sewers on Quail Street, discharging to Washington Park Lake.

Construction of a new larger diameter forcemain for the I-90 pump station as part of the 1385 Washington Avenue development project was completed by the developer, in 2019. The forcemain was upgraded from 6-inch to 10-inch, along with increasing the size of the piping in the pump station and installing a larger meter. This project resulted in increased capacity without increasing the size of the pump station pumps.

Three brick chimney manholes in poor condition were rehabilitated in 2020.

In 2021, approximately 13,000 linear feet of 8-inch to 36-inch diameter sewer was lined with cured-in-place liner. In addition, 1400 linear feet of 5.5-foot elliptical brick trunk sewer in Washington Park was rehabilitated using cementitious spray liner.

2021 construction work also included replacing brick and slate sewers that cause operational problems at Catherine Street and Westerlo Street. The combined sewer on Westerlo was replaced with new sanitary and storm sewers, as discussed in the previous section. The AWB is planning for the rehabilitation of three segments of brick and slate sewers in 2022.

In 2022, approximately 11,000 linear feet of 10-inch to 30-inch sewer and one segment of 32-inch by 48-inch elliptical brick sewer was lined. On Osborne Steet, 725-feet of 18-inch brick and slate sewer was replaced with PVC.

In 2023, AWD replaced approximately 815 linear feet of 15-inch brick and slate sewer on Phillips Street between Elm Street and Park Avenue. Approximately 11,500 linear feet of 10-inch to 36-inch sewer and 160 linear feet of 32-inch by 48-inch sewer was lined at the Clinton Market.
There was limited sewer lining work completed in 2024 and only to address sewers in immediate need of rehabilitation. A sewer lining rehabilitation contract was awarded in 2024 for approximately 15,000 linear feet of sewer. Work under this contract will be completed in 2025.

C4-5402-19-00 grant and 2021 bonds are being used for the sewer lining in 2024. C4-5402-21-00 financing to proceed in 2025 for several years for the sewer collection projects. The project amount is $15,711,097 and BIL grant amount is $8,000,500.

AWB developed a Clean Water State Revolving Fund Engineering Report. The report details the capital improvements needed for the sewer system. The projects comprise of trunk sewer improvements, collection system improvements, sewage pump station improvements, combined sewer overflow tide gate improvements, as well as flow metering for inflow and infiltration detection and reduction and optimizing flows to the Albany County Water Purification District-South Plant. The project total cost is estimated to be just under $12.5 million.

Table 3-2. Recent Projects for Sewer Rehabilitation and Upgrade

Recent Improvements	Completion Date
Lined approximately 5290 linear feet of sewer	2017
Lined approximately 1075 linear feet of sewer	2018
SUNY Alumni Quad sewer updates	2018
Upgraded forcemain on Washington Avenue	2019
Lined approximately 15,000 linear feet of sewer	2019
Lined approximately 11,000 linear feet of sewer	2020
Rehabilitated three brick chimney manholes	2020
Lined approximately 13,000 linear feet of sewer using cured-in-place liner, and 1400 linear feet of sewer using cementitious spray lining	2021
Replaced brick and slate sewers on Catherine Street and Westerlo Street.	2021
Lined approximately 11,000 linear feet of sewer. Replaced 725 feet of brick and slate sewer	2022
Replaced approximately 815 linear feet of 15-inch brick and slate sewer and lined approximately 11,500 linear feet of 10-inch to 36-inch sewer and 160 linear feet of 32-inch by 48-inch sewer.	2023

The following projects are planned for 2025:

- Continue the systematic sewer inspection and condition assessment program.
- Sewer rehabilitation of approximately 10,000 – 15,000 linear feet of sewer with cured-in-place pipe at various locations.

Projects being considered, but not currently scheduled, include:

- Chimney manhole rehabilitation
- Replacement of sections of brick and slate sewer. Brick and slate sewer replacement is planned for Dove Street (600 linear feet), First Street (1200 linear feet), and Dana Avenue (1470 linear feet).
- Trenchless rehabilitation of Beaver Creek Trunk Sewer at Lincoln Park Pool

Tables showing summaries of planned projects for the next five years is provided in Appendix A, Five Year Capital Improvement Program (2025-2029) Summary of Costs.

3.3 Sewer Pump Stations

The entire sewer system includes 30 pump stations (including small pump stations serving residential sub-developments). The pump stations consist of multiple pumps, meters, controls, and appurtenances which require periodic repair or replacement. Upgrades, modifications, and equipment replacement needs for these pump stations, as determined by AWB, are completed yearly. Many of the projects are being completed with operating funds rather than through new dept.

3.3.1 Condition of the Sewer Pump Stations

The existing generators at Broadway, New Scotland Woods and Old South Pearl pump stations are nearing the end of their useful life and require a lot of maintenance according to AWB staff. Also, replacement parts are not readily available for the units. The AWD was planning to replace these generators and replace the buried fuel tanks in 2024, however that work was not completed and has been pushed to 2025. AWB staff also reported that power at the Par Circle pump station is not reliable, and the addition of a generator would cut back on time being spent at Par Circle during power outages. AWB has been addressing many of these projects inhouse with AWD staff.

The existing controls at Wilan Lane, Delaware Avenue 1 and 2, and Whitehall Station pump stations are outdated and require frequent maintenance. The controls for these four pump stations should be replaced with new control systems.

3.3.2 Recently Completed and Planned Projects

In 2014, the comminutor was replaced at the McCormack Road Pump Station. The following year, this pump station was upgraded with SCADA equipment and variable speed drives.

In recent years updates to the SCADA systems at numerous pump stations have been completed. This enables the AWD to acquire real time alarm and flow data. A new control panel was installed in the Par Circle pump stations in 2016, and in the I-90 and Delaware Avenue pump station #1 in 2017. In 2016, SmartCover® flow level monitoring devices were installed at Woodville pump station.

The generator at the Woodville pump station was replaced in 2019 and at Meadow Lane Pump Station in 2020.

A new sewage pump station was constructed at the W. Averell Harriman State Office Building Campus to pump sewage to the Patroon Creek sewer system and free up capacity in the Beaver Creek sewer system. (Upper Washington Corridor Project - 2016-2018 - CWSRF & DWSRF). This project was completed in 2020.

New submersible pumps were installed at the Northern Boulevard pump station in 2021. The existing pumps needed repair, and the lead time and costs of parts made it more cost effective to replace the pumps. A single pump at Woodville Pump station was replaced with a dry-pit submersible pump to protect the pump from flooding that occasionally occurs at this location.

In 2022, a second pump was replaced at the Woodville pump station, and a third pump was replaced in 2023. The Northern Boulevard pump station is located adjacent to a nursing home. Large amounts of rags are conveyed to the pump station presumably from the nursing home. A comminutor was installed at this pump station to alleviate some of the maintenance issues associated with the ragging. The

comminutor was out for repair during our site visit; however, it was anticipated it would be re-installed within a couple of weeks.

Improvements in 2022 include a new flow meter at the McCormack Road pump station, piping upgrades at Broadway and Delaware Avenue 1 pump stations, and new remote monitoring equipment at Pinehurst Estates pump station.

The AWD has transitioned from a third party that hosts Ignition SCADA to their own servers. The servers were purchased in 2021, the transition to the new servers was completed in 2022.

The new pump station at Marlborough Court was completed and in service at the end of May 2023. The construction included a new wetwell and drywell, pumps, controls, SCADA system, and other ancillary equipment. The new pump station is located on City property at the end of Marlborough Court which is a dead-end street. The old pump station was decommissioned, and the electrical service was disconnected. The new pump station will allow the only City resident that is on private septic to hook up to the public sewer.

Photo 3-1: New Marlborough Court Pump Station

Northern Boulevard pump station was updated with a new control panel, SCADA system, a comminutor and other ancillary equipment. These improvements were completed and in service at the end of May 2023. The improvements have decreased the need of having a private contractor pump out debris approximately every 3 weeks to prevent clogs and jammed pumps. The Northern Pump Station has not needed to be pumped out since the new improvements.

Updates were made to several other pump stations in 2024, including Meadow Lane, Delaware Avenue 2, South Pearl, Corporate Woods, New Scotland, I-90, Woodville, Snow Dock, Corning, Preserve, and Pinehurst pump stations. The majority of these improvements were completed by AWD staff. Details are provided in Table 3-3 below.

Photo 3-2: New effluent piping at Corning Preserve Pump Station

Photo 3-3: New conduit at Snow Dock

Table 3-3. Recent Projects for Sewer Pump Stations

Recent Improvements	Completion Date
McCormack Road Pump Station Improvements – Upgraded SCADA and variable speed drives	2014
Par Circle Pump Station Control Panel and SCADA	2016
Woodlawn Pump Station SmartCover®	2016
I-90 and Delaware Avenue Pump Station #1 Control Panel and SCADA	2017
I-90 Pump Station piping upgrades	2018
Generator Replacement at Woodville Pump Station	2019
Generator Replacement at Meadow Lane Pump Station	2020
W. Averell Harriman State Office Building Campus pump station	2020
Woodville pump station pump no. 1 replacement	2021
Northern Boulevard pump replacement	2021
Various SCADA Upgrades	2021
Woodville pump station pump no. 2 replacement	2022
Comminutor installation at Northern Boulevard pump station	2022
New flowmeter at McCormack pump station	2022
Piping upgrades at Broadway and Delaware Avenue 1 pump station	2022
Installation of remote monitoring equipment at Pinehurst Estates	2022
Construction of new Marlborough Court pump station	2023
Northern Boulevard pump station improvements	2023
New control panel at Wilan Lane station	2023
Woodville pump station pump no. 3 replacement	2023
New VFDs at Harriman Campus station	2023
New vacuum pumps at St Agnes and Meadow Lane stations	2023
New check valves at Whitehall Road and Corporate Circle stations	2023

New pump rail supports at Whitehall Road station	2023
New pump impellers at Pinehurst, Lowell and Quakenbush stations	2023
I-90 pump station pump no. 1 replacement	2023
New heaters and vac pump at Meadow Lane	2024
New pump impellers at Delaware Avenue 2, South Pearl and I-90	2024
New relay controller at Corporate Woods	2024
New automatic transfer switch at New Scotland	2024
New grinder at I-90	2024
New generator batteries and inlet piping at Woodville	2024
New floats and conduit at Snow Dock	2024
New discharge piping at Corning Preserve	2024
New bubblers at Pinehurst and South Pearl	2024
New batteries and fuel pump for the portable generator	2024
Redundant servers and redundant Ignition licenses	2024

The following projects are planned for 2025:

- Continue to update site SCADA systems at the pump stations.
- Replacement of generators at Old South Pearl, Broadway and New Scotland Woods pump stations and removal of the buried fuel storage tanks.
- New Controls at Wilan Lane and Meadow Lane pump stations.
- Installation of remote monitoring equipment at Meadow Lane pump station.
- Ignition SCADA platform upgrades continue. Redundant servers and redundant Ignition licenses were completed in 2024. AWD is in the process of upgrading to use the Ignition Perspective software as the Human Machine Interface.

These projects are recommended but not currently scheduled:

- Addition of a generator at Par Circle pump station.
- Replacement of controls at Whitehall, Delaware Avenue 1 and Delaware Avenue 2 pump stations.

Tables showing summaries of planned projects for the next five years is provided in Appendix A, Five Year Capital Improvement Program (2025-2029) Summary of Costs.

3.4 Combined Sewer Overflows (CSOs)

The sewer system includes 22 combined sewer overflows regulators that discharge to 11 outfalls. The 11 outfall locations are listed in Table 3-4 below. An additional overflow was discovered in 2016 from historic drawings showing the construction of the Empire State Plaza. The AWB notified the NYSDEC of this during their CSO State Pollutant Discharge Elimination System (SPDES) permit negotiations. The overflow discharges to the Arch Street outfall.

One of the 22 overflows are from sewer system pump stations and provide discharge to waterways should the pump stations fail. The remaining 21 are combined sewer overflows that discharge to the Hudson River during wet weather conditions. These overflows minimize the potential for sewage backing up into basements and streets as a result of the storm water surcharge. The amount of overflow is governed by the ACWPD regulators on the Hudson River Interceptor South.

As part of the LTCP, three of the CSOs shown in the chart below are scheduled to be removed and/or modified to eliminate discharges to the Hudson River. Bouck Street was modified in 2018.

It was discovered in the late 1980's that the Hudson River at high tides was flowing to Hudson River Interceptor South through the overflow/outfall systems. A series of backflow devices were constructed in the early 1990's to prevent the backflow conditions. New data collected in 2019 indicates inflow from the Hudson River whenever the tide is above 5.5 feet (USGS NGVD 1929). Two new tide gates were installed, and one dam was raised in 2019.

An actuated gate at the Big C regulator is being constructed to divert treated flow from the new Beaver Creek Clean River Disinfection and Floatables Control facility to the river once the facility is in operation. This will allow untreated combined sewage to be conveyed to the WWTP as a priority over the treated wastewater from the satellite facility. The new tide gate is being installed near outfall 016 to keep river water out of the combined sewer. This project is anticipated to be completed in early 2025.

Table 3-4. CSO No. Location Outfall

No.	Location	To
012	Woodville Pump Station	To Krum Kill
013	Bouck Street	To Hudson River near Gansevoort Street extension
014	Gansevoort Street	To Hudson River near Gansevoort Street extension
015	Schuyler Street	To Hudson River near Schuyler St. via I-787 sewer
016,017,018	Rensselaer Street	To Hudson River near Rensselaer Street extension
020	Arch Street	To Hudson River near Arch Street extension
022	Hamilton Street	To Hudson River near Hamilton St. ext. via I-787 sewer
024	Division Street	To Hudson River near Division Street
026	Maiden Lane	To Hudson River near Corning Preserve Pedestrian Bridge

No.	Location	To
030	Spencer Street	To Hudson River near Corning Preserve Parking Lot
032	Thatcher Street	To Hudson River via Patroon Creek

The Arch Street location had two outfalls. A stone arch sewer discharged to outfall 019 and a monolithic concrete relief sewer to outfall 020. The overflow at Regulator A was redirected to the monolithic concrete relief sewer and now discharges to outfall 020 under a CSO event. Outfall 019 has been eliminated, and the NYSDEC has been notified of the new diversion.

3.4.1 Recently Completed and Planned Projects

The SmartCover® System is wireless flow level monitoring device that allows the AWB to monitor flows, analyze trends, and to be notified when combined sewer overflows occur.

SmartCovers® were installed at three locations in 2016. They were installed at the Woodville Pump Station and the dam on the Big C regulator to detect combined sewer overflows for the Sewage Pollution Right to Know Act. One was also installed on Elberon Place, between Quail Street and South Lake Street, to monitor flow level during heavy rain events as an early detection system of potential street flooding.

Phase 2 of this project began in 2017. This included the installation of an additional ten SmartCovers®. Six of these devices were installed at regulators to identify combined sewer overflows, two monitor flow entering the County interceptor (Green Street and Orange Street), and two are used for early detection for potential street flooding (Hackett Trunk and Fox Creek Trunk).

In 2017 the ACWPD agreed to allow the AWB to install SCADA on four of their meters to transmit real time flow information to the AWB. The locations were chosen to assist with understanding flow conditions for planning upcoming projects.

In 2018, the AWB awarded a contract for the expansion of the SmartCover® program. It included the installation of thirteen (13) new data collection sites at existing manholes that integrate with the existing Sewer SCADA system. Eight (8) of the sites measure level and flow data, while the remaining five (5) measure level data only. The project was completed in 2020.

In 2019, Hach Flo-Dar Meters are installed in three (3) locations:

- Big C Regulator- on pipe to ACWPD (36-inch)
- Big C outfall pipe to the Hudson River
- Warren Street on the Beaver Creek Trunk, below the site of the Beaver Creek Satellite Treatment Facility.

Construction of a new tide gate and new actuated gate at the Big C Regulator will be completed in early 2025. The new tide gate will be used to keep river water out of the combined sewer, and the actuated gate at the Big C regulator will divert treated flow from the new floatables and disinfection facility to the river when in operation. The tide gate was installed near outfall 016. AWB was awarded BIL and WIIA

funding for this work. Total project cost $6,100,000. Funding includes $3,000,000 WIIA, $1,270,000 BIL, and a $1,830,000 0% loan.

Table 3-5. Recent Projects for the Combined Sewer Overflows

Recent Improvements	Completion Date
SmartCovers® installed at the Woodville Pump Station, Big C regulator, and in an Elberon Place manhole.	2016
SmartCovers® installed at the combined sewer overflow regulators located at Maiden Lane, Steuben St, Orange St, Quackenbush Square, Jackson/Livingston. SmartCovers® also installed at the Green Street interceptor, Orange Street interceptor, Hackett Boulevard Trunk, and the Fox Creek Trunk.	2017
SCADA installation at four ACWPD flow meters to transmit real time flow information to the AWD (I-90 sewer pump station meter, Pine Bush meter on Fuller Road, South Plant meter, Russell Road meter)	2017
SmartCover ® program – 13 new data collection integrated with the SCADA system. Eight with level and flow, 5 with just level.	2019-2020
New tide gate and actuated gate at the Big C Regulator	Early 2025

No new projects are planned for 2025:

Tables showing summaries of planned projects for the next five years is provided in Appendix A, Five Year Capital Improvement Program (2025-2029) Summary of Costs.

3.5 ACWPD Facilities Serving the Sewer System

Although not a part of the sewer system, several major components of the ACWPD are integrally connected with and serve the System and are briefly described here.

3.5.1 Patroons Creek Trunk Sewer

The Patroons Creek Trunk Sewer was constructed between 1969 and 1974 by ACWPD. Most of it is located within the northern boundary of the City. The sewer serves three City Districts as well as the Town and Village of Colonie and the Town of Guilderland. It begins at a point in the Town of Colonie in the vicinity of the southernmost reach of the Village of Colonie and terminates at the North Plant. ACWPD monitors flows in this trunk sewer through the use of sixteen ACWPD owned and operated meter units and a telemetering system.

3.5.2 North and South Plants

The North and South Plants are virtually identical in process design, differing only in installed capacities. Both plants employ a conventional activated sludge treatment process to achieve secondary treatment

levels (85% reduction of the influent biochemical oxygen demand and suspended solids levels). Sludge at both plants is dewatered prior to incineration, with the resultant ash being landfilled. The North and South Plants were constructed during the period from 1969 to 1974. The North Plant has a permitted average flow of 35 MGD and is located in the Village of Menands on a 28-acre site adjacent to the Hudson River. The South Plant has a permitted 29 MGD flow and is located in the City on a 32-acre site just north of the Port of Albany.

4 ASSET MANAGEMENT PLAN UPDATE (2024)

In 2017, AWD developed an Asset Management Plan (AMP) for the water and sewer system. The development of this plan assists the AWB prioritize and implement asset management elements into its operations. Recommendations included the need to inventory assets and perform condition assessments of infrastructure to support the next steps of the asset management program. Elements of the Plan that require funding from the Capital Budget have been included in this CIP and will be updated annually.

Asset Management Status Update tables provide a list of initiatives, details about the tasks planned, and a timeline for completion. This updated table is included in this document as Appendix D. A general summary of the focused efforts for 2024, the updates to the schedule, and planned work for 2025 is shown below.

Work completed in 2024 and planned for 2025.

- **CCTV Inspection of Large Diameter Sewers** –The completion of critical trunk sewer inspections is planned for 2025 and has been budgeted in the CIP.
- **Based on Results of CCTV Inspections, Perform Sewer Rehabilitation, Replacements, and Spot Repairs –**AWD awarded a contract for approximately 15,000 feet of sewer to be lined in 2025.
- **Add Pipeline Assessment Certification Program (PACP) scoring to GIS –** AWD is actively adding the PACP scoring to pipe segments in GIS. To date they have added scores to 40 pipe segments or about 10,600 linear feet. The scoring of the critical trunk sewers is scheduled to be completed by 2025.
- **Computerized Maintenance Management Software (CMMS)** - AWB began using the program Utility Cloud in 2019 and has expanded upon its use each year.

  The program is currently used for logging customer calls, developing and tracking of work orders, sewer and water investigations and repairs, sewer inspection scheduling and tracking, dig safe tickets, and restoration tracking. The program has been synced with an online GIS application. AWB will continue to expand upon utilization of the program and expanding upon the use of GIS.
- **Service Levels and Key Performance Indicators (KPIs) –** Service levels are reviewed and discussed annually by AWB staff and are periodically adjusted. KPIs are used to track the success of meeting service levels. The data stored and managed in the Utility Cloud program is used to track and manage KPIs.
- **Develop criticality (CoF) scores for all AWB sewers** - This was planned to be completed in 2019 but was not completed. The development of criticality scoring for all sewers is a significant effort and will be a priority task in 2025.
- **Improved Combined Sewer System and MS4 Basin Monitoring** - A $1 million-dollar WQIP grant was executed in 2019 for the planned green infrastructure improvements on Hackett Boulevard. In 2024, completed modifications to an existing stormwater detention pond on an easement from the Congregation of Beth Emeth. The AWD enlarged the size of the stormwater

detention basin with constructed wetlands on the lower areas of the basin on Academy Road. Opti controls were integrated to control the water elevation in the detention basin. This project is anticipated to be operational by the end of 2024, and fully completed in 2025.

Thurlow Terrace sewer separation project is planned for 2025. The project includes the construction of a separate storm sewer, which will discharge to Washington Park Lake. The lake has an outlet control system with continuous monitoring and adaptive control of lake level used to discharge stormwater back to the combined sewer off peak precipitation events.

4.1 Items to Include in Future CIPs

- **Conduct Inventory & Condition Assessment of Wastewater Pump Station Equipment –** A formal condition assessment of all large pump stations is scheduled to be completed by 2024 and all pump stations by 2029. This is a significant effort and should be planned and included in the CIP if being completed by a consultant.
- **Improved Sewer Pump Station Monitoring** – AWD has recently updated the SCADA system at eight pumps stations and plans to continue to update two pump stations a year. SCADA updates are budgeted in the CIP, and these SCADA updates are scheduled to be completed by 2029.
- **Improved Combined Sewer Overflow Monitoring** - AWB has been installing flow meters with telemetry to measure flow to the County interceptor and identify overflow when they occur. The AWB has a 5-year short-term loan to complete this work, and it is anticipated to be completed in the next few years.

APPENDIX A

Five Year Capital Improvement Program (2025-2029) Summary of Costs

Albany Water Board/Albany Municipal Finance Authority
Five Year Capital Improvement Program (2025-2029)
Projects Funded through Grants, Long Term Financing, and Ongoing Project Funds

Budget Code	Task Name	Source	2025	2026	2027	2028	2029	Future	Totals
7620	**CSO Long Term Control Plan**		**$2,858,366**	**$2,931,320**	**$746,488**				**$6,536,174**
	Administrative		$193,644	$193,644	$193,644				$580,932
	Engineering, CDPRC, Auditor, Legal	C4-5042-14-04	$193,644	$193,644	$193,644				
	BMPs/System Optimization		$59,233	$1,038,362					$1,097,595
	Remove Liberty & Schuyler Overflow - Albany BMP-11 & 13	C4-5402-14-04	$59,233	$1,038,362					
	System Separation/Stormwater Storage			$552,844	$552,844				$1,105,687
	Manor Ave - Cohoes SSS-14	C4-5402-14-04		$552,844	$552,844				
	Satellite Treatment and/or Floatable Control Facilities		$2,146,470	$1,146,470					$3,292,941
	Big C Disinfection & Floatables Control - Albany	C4-5402-14-02	$1,000,000						
	Floatables Control Facility - Little C - Cohoes	C4-5402-14-04	$1,146,470.5	$1,146,470					
	Tributary Enhancements		$459,018						$459,018
	Cross Street Phase II - Troy	C4-5402-14-04	$459,018						
	Water Comprehensive Plan of 2019		**$5,331,357**	**$1,100,000**	**$4,164,010**	**$4,164,010**	**$6,400,000**		**$21,159,377**
7530	Lime Building	18523	$652,140						$652,140
7530	Aeration Basin Ventilation and Damp Proofing	18903	$2,909,337						$2,909,337
7530	Maintenance Building at Feura Bush & Lime Feed System	18903	$1,769,880						$1,769,880
7530	Filter Upgrades Phase 1 - Mixing Basins	18903		$1,100,000					$1,100,000
7530	Filter Upgrades Phase 2 - 4 Filters	19157			$2,248,481	$2,248,481			$4,496,961
7556	Pine Bush and Upper Service Tanks Painting	19157			$811,767	$811,767			$1,623,534
7556	Pine Bush Pump Station Renovations	19157			$273,447	$273,447			$546,893
7530	Clearwell Rehabilitation	19157			$330,316	$330,316			$660,632
	Engineering and closing costs	19157			$500,000	$500,000			$1,000,000
7530	Filter Upgrades Phase 3	4th					$4,000,000		$4,000,000
7530	Miscellaneous Feura Bush Facility Upgrades	4th					$1,000,000		$1,000,000
7530	Influent Flow Control & Hydro Decommission	4th					$1,000,000		$1,000,000
7530	Energy Saving Upgrades	4th					$400,000		$400,000
	Bond Issuance of 2021		**$2,234,427**						**$2,234,427**
7530	Feura Bush Lime System	Albany MWFA	$284,903						$284,903
7540	Pressure Reducing Valve Telemetry - Utility power		$100,000						$100,000
7556	Harriman Water PS equipment replacement		$300,000						$300,000
7620	Sewer Rehab - Sewer lining projects - 24-inch and smaller	19-00	$1,549,524						$1,549,524
7610	**Sewer Separation**		**$7,184,500**	**$4,650,000**					**$11,834,500**
	Academy Road Constructed Wetland EFC (BIL)	C4-5402-17-00	$1,943,500	$2,000,000					$3,943,500
	Academy Road Constructed Wetland GIGP	C4-5402-17-02	$50,000						$50,000
	GI Banking DEC WQIP	DEC WQIP	$300,000						$300,000
	Beaver Creek Reflection and Learning (WQIP Grant and EPL Grant)	DEC/EPL/AWB	$2,335,000						$2,335,000

Albany Water Board/Albany Municipal Finance Authority
Five Year Capital Improvement Program (2025-2029)
Projects Funded through Grants, Long Term Financing, and Ongoing Project Funds

Budget Code	Task Name	Source	2025	2026	2027	2028	2029	Future	Totals
	Thurlow Terrace - WQIP, WIIA, SUNY Share	C4-5402-20-00	$1,256,000	$1,250,000					$2,506,000
	North Hawk GI Project, GIGP, Habitat, GI Bank	C4-9249-03-00	$1,300,000	$1,400,000					$2,700,000
7670	**Overflows**		**$2,552,075**						**$2,552,075**
	Beaver Creek Tide Gates - C4-5402-18-00 WIIA on LT ($937,500)	C4-5402-18-00	$2,552,075						$2,552,075
7630	**Sewage Pump Stations - See Sewer Collection System Comp. Plan**								
	Krum Kill Sewer District - Diversion to Guiderland								
7511	**Supply Reservoirs**			**$5,000,000**	**$9,777,738**			**$2,675,000**	**$17,452,738**
	Basic Creek Construction	19127		$2,750,000	$4,572,850				$7,322,850
	Basic Creek Engineering - Construction Phase	19127		$250,000	$250,000				$500,000
	Rensselaer Lake Construction	19558		$1,750,000	$4,704,888				$6,454,888
	Rensselaer Lake Engineering - Construction Phase	19558		$250,000	$250,000				$500,000
	Alcove Spillway Design							$150,000	$150,000
	Alcove Spillway Construction							$2,400,000	$2,400,000
	Alcove Spillway Engineering - Construction Phase							$125,000	$125,000
7540	**Lead Service Line Replacement**		**$5,000,000**	**$5,000,000**	**$4,000,000**	**$5,000,000**	**$7,864,426**		**$26,864,426**
	LSL Replacement First Tranche	19456	$4,000,000	$4,000,000	$1,864,426				$9,864,426
	LSL Inventory	19609	$1,000,000	$1,000,000					$2,000,000
	2025 IUP	2025 IUP			$2,135,574	$5,000,000	$7,864,426		$15,000,000
7512	**Supply Conduit**								
	Studies and Engineering Reports								
7530	**Feura Bush Filtration - See Comprehensive Plan above**								
	Studies and Engineering Reports								
7540	**Distribution System**		**$2,000,000**	**$2,000,000**	**$1,604,722**	**$2,000,000**	**$2,000,000**		**$9,604,722**
	Water main and valve replacements	19554	$2,000,000	$2,000,000	$1,604,722				$5,604,722
	Futue IUP					$2,000,000	$2,000,000		$4,000,000
7555	**Loudonville Reservoir - See Comprehensive Plan above**								
	Studies and Engineers Reports								
7556	**Water Pumping Stations and Tanks - See Comprehensive Plan above**								
	Studies & Engineering Reports								
7580	**10 North Enterprise & 35 Erie**								
	Studies & Engineering Reports								
	Sewer Collection System Comprehensive Plan		**$5,839,154**	**$6,000,000**	**$4,161,034**	**$3,000,000**	**$3,000,000**		**$22,000,188**
7610	Sewer Separation $2,785,453	C4-5402-21-00	$1,000,000	$1,000,000	$785,453				$2,785,453
7620	Sewer Rehabilitation $8,905,219	C4-5402-21-00	$3,500,000	$3,500,000	$1,905,219				$8,905,219
7630	Sewage Pump Stations $1,773,206	C4-5402-21-00	$500,000	$500,000	$773,206				$1,773,206

Albany Water Board/Albany Municipal Finance Authority
Five Year Capital Improvement Program (2025-2029)
Projects Funded through Grants, Long Term Financing, and Ongoing Project Funds

Budget Code	Task Name	Source	2025	2026	2027	2028	2029	Future	Totals
7670	Overflows $1,197,156	C4-5402-21-00	$500,000	$500,000	$197,156				$1,197,156
	Engineering and closing costs $1,339,154	C4-5402-21-00	$339,154	$500,000	$500,000				$1,339,154
	Future IUP Listing					$3,000,000	$3,000,000		$6,000,000
	TOTAL		**$32,999,879**	**$26,681,320**	**$24,453,992**	**$14,164,010**	**$19,264,426**	**$2,675,000**	**$120,238,627**
	Capital Reserves Funding - Reflection & Learning Garden Local Share		$835,000					$0	$835,000
	Water Revenue or Capital Reserves							$0	$0
	Future Financings							$2,675,000	$2,675,000

APPENDIX B

Summary of Completed Engineering Reports (2024)

Rensselaer Lake Dam Design Report – Revised

Schnabel Engineering, June 30, 2023

This report outlines rehabilitation methods considered for the Rensselaer Lake Dam, a high-hazard (Class C) dam regulated by the New York State. It summarizes the deficiencies of the dam and the results of subsurface explorations and dam inspections. It analyzes various methods for dam rehabilitation, considering probable construction costs, long term life-cycle costs for operation and maintenance, and non-monetary factors including water supply, dam safety, environmental and public relations.

Water Supply Fluoridation Preliminary Engineering Report

CHA Consulting, September 30, 2024

This report details preliminary descriptions of a proposed fluoride system that would be constructed at the Feura Bush Water Filtration Plant. It evaluates several options for fluoridation, considering ease of operation, availability of chemical, and cost of fluoridation. The report provides a preliminary timeline and cost estimate for installation of the proposed fluoride system.

Basic Creek Dam Subsurface Exploration Data Report

Schnabel Engineering, February 23, 2024

This report presents the finding of the geotechnical subsurface exploration and testing program performed at Basic Creek Dam in 2016 and 2024. The purpose of the programs was to collect data to identify and characterize on-site subsurface materials and conditions at the Basic Creek Dam. The report provides data collected from the exploration and testing programs.

Krum Kill Pump Station Evaluation

Delaware Engineering, April 2024

This report details various methods to divert flows from Albany's sewer system to the Town of Guilderland sewer system and Dillenbeck Pump Station to support the implementation of the Combined Sewer Overflow (CSO) Long Term Control Plan. It discusses the project's necessity and assesses several options for diversion considering construction costs, land needs, and environmental consequences.

APPENDIX C

Asset Management Status Update

Phase	Initiative Strategy	Resources (internal/ external)	Task Details	Investment Level	Timeline Comments
Initiative 1 – Sewer Inspection & Rehabilitation Program					
Phase 1	**Strategy 1a** Perform CCTV condition assessment of critical sewers	AWB and Consultant	-Conduct CCTV inspection program for all large diameter interceptors using the PACP scoring methodology. **Status Update:** **AWB inspected critical large diameter sewers in 2016, 2017, and 2018 and the contractor used PACP scoring.** **All large diameter brick sewer manholes located in the road were inspected in 2018, and the rehabilitation design was completed in 2019.** **AWB continues to inspect critical trunk sewers each year and will be completed by 2025.** -Develop criticality (CoF) scores for all AWB sewers. **Status Update:** **The AWB has been updating GIS in order to perform this task. GIS will be used to develop and assign criticality scores. This task was planned to be completed by December 2019, but due to staff changes and the COVID crisis this it was revised for 2025.**	Medium	**Started in 2016** **AWB critical trunk sewer inspections will be completed by 2025.** **Criticality scores were originally planned for completion by December 2019, but has been revised for December 2025**

Phase	Initiative Strategy	Resources (internal/ external)	Task Details	Investment Level	Timeline Comments
Initiative 1 – Sewer Inspection & Rehabilitation Program - Continued					
Phase 1	**Strategy 1a** Perform CCTV condition assessment of critical sewers	AWB and Consultant	-Conduct CCTV inspection program using PACP scoring methodology for additional high priority sewers based on CoF evaluation **Status Update:** **All contractor CCTV inspections have PACP scoring, which is added to the GIS. Likewise, AWD staff review video taken by their own staff, score it using PACP scoring, and add the score to the GIS.** **Although criticality scoring has not been assigned to all sewers, AWB has scheduled inspections for sewers already known to be critical. (AWB plans on inspecting all critical trunk sewers by the end of 2025)** -As more inspection scoring data becomes available, determine whether there are any patterns that emerge that associate key pipe characteristics with poor pipe condition scores (e.g., pipe age, material, size). This can be used to further refine and prioritize the sewer inspection program to focus sewer inspection activities on pipes with these characteristics. **Status Update: This will be completed once more data becomes available.**	Medium	**This CCTV inspection program using PACP scoring has started and will be substantially complete once the critical sewer inspections are complete.** **PACP scoring is entered in GIS as the data becomes available.**
	Strategy 1b Perform sewer rehabilitation as required	AWB	Based on results of CCTV inspections above, perform sewer rehabilitation, replacements, and spot repairs as required. **Status Update: In 2017, 21 small diameter pipe segments totaling about 7,800 linear feet were lined.** **In 2018, 24 small diameter segments totaling about 5,950 linear feet were lined. Additionally, 1,435 linear feet of critical, large diameter sewer were rehabilitated with centrifugally cast concrete pipe.** **In 2019, approximately 15,000 linear feet of small diameter sewer was lined.** **In 2020 approximately 11,000 linear feet of sewer was lined ranging**	High	Based on results of Strategy 1a **This work is completed annually. The locations will be selected based on the results of CCTV inspections. This is an ongoing task.**

			from 12-inch to 36-inches in diameter. This included approximately 2,000 linear feet of 36-inch sewer along I-90. Three critical brick chimney manholes were also rehabilitated **In 2021, approximately 13,000 linear feet of 8-inch to 36-inch diameter sewer was lined with cured-in-place liner. In addition, 1400 linear feet of 5.5-foot elliptical brick trunk sewer in Washington Park was rehabilitated using cementitious spray liner.** **AWB awarded a contract for rehabilitation of three brick chimney manholes in poor condition in 2020, and is planning for the rehabilitation of more brick chimney manholes in 2024** **2021 construction work also included replacing brick and slate sewers that cause operational problems at Catherine Street and Westerlo Street. The combined sewer on Westerlo was replaced with new sanitary and storm sewers.** **In 2022, approximately 11,000 linear feet of 10-inch to 30-inch sewer and one segment of 32-inch by 48-inch elliptical brick sewer was lined. On Osborne Steet, 725-feet of 18-inch brick and slate sewer was replaced with PVC.** **AWB will continue to CCTV inspect sewers and rehabilitate annually.** **In 2023, AWD replaced approximately 815 linear feet of 15-inch brick and slate sewer on Phillips Street between Elm Street and Park Avenue. Approximately 11,500 linear feet of 10-inch to 36-inch sewer and 160 linear feet of 32-inch by 48-inch pipe was lined at the Clinton Market. A similar quantity is planned for 2025.**		
Phase 1	**Strategy 1c** Assign PACP standard scoring to available CCTV	AWB or Contractor	-Train AWB staff to score CCTV inspection videos using PACP scores, or hire outside entity to score available CCTV recordings. **Status Update:**	Low	**Training is complete.**

			AWB had four employees PACP trained in 2018. -Reference the scores to the pipelines in GIS. **Status Update:** **AWB has added PACP scoring to CCTV inspections completed by AWD staff and then added to GIS.** **Continue to do this annually. Currently, 40 pipe segments are scored, or about 10,600 linear feet**. -Require contractors to use PACP scoring **Status Update:** **AWB currently requires CCTV contractors to use PACP scoring. This can be linked to the City GIS**		**Adding the PACP scoring to GIS is an ongoing process completed when sewers are inspected. GIS will be updated with scores for all critical trunk sewers by 2025.** **This was completed.**
Phase 3	**Strategy 1d** Perform CCTV inspection of sewers/manholes in high I/I areas	AWB	-Perform PACP and MACP inspections of sewer/manholes in areas that have been separated and flow monitoring data indicates high contributions of I/I	Medium	**This will begin in 2024. Inspection of high I\I areas will be completed by 2029.**

Phase	Initiative Strategy	Resources (internal/ external)	Task Details	Investment Level	Timeline
Initiative 2 – GIS Improvements and CMMS Implementation					
Phase 1	**Strategy 2a** Complete updates to the sewer GIS	AWB with Consultant Participation	Complete desktop updates to AWB's sewer system GIS using existing maps, the LGIM and the methodology established during the GIS pilot program. This includes fixing pipe geometry and connectivity, filling in missing attribute data that is available, and adding missing features such as catch basins. **Status Update: AWB is presently making these updates and anticipates being completed by the end of 2025.**	Medium	**This began in 2016 and is planned for completion by 2025**
	Strategy 2b Obtain a CMMS System	AWB with Consultant Participation	- Compile a list of AWB's functional and technical requirements for a CMMS	Low Low	**Completed.**

Phase	Initiative Strategy	Resources (internal/ external)	Task Details	Investment Level	Timeline
			-Issue an RFP for a CMMS, including a software demonstration evaluation -CMMS Implementation, including software procurement, configuration, data conversion, training, and integration with other City software as required. **AWB began using the program Utility Cloud in 2019. The program is currently used for logging customer calls, developing and tracking of work orders, sewer and water investigations and repairs, sewer inspection scheduling and tracking, dig safe tickets, and restoration tracking. The program has been synced with an online GIS application. AWB will continue to expand upon utilization of the program and expanding upon the use of GIS.**	High	
Phase 2	**Strategy 2c** Maintain and utilize the work order management system that tracks time, materials, cause of the break/damage and type of repair down to the asset level.	AWB with Consultant Participation	-With the CMMS in place, develop operating procedures to manage work orders, notifications, and preventative maintenance activities through the software. -Develop operating procedures for updating the GIS, when field activities find discrepancies.	Medium Low	**Completed** **Completed, but continue to improve upon**

Phase	Initiative Strategy	Resources (internal/ external)	Task Details	Investment Level	Timeline
Initiative 3 – Service Level Reporting Pilot					
Phase 1	**Strategy 3a** Perform Service Level Reporting Pilot.	AWB with Consultant Participation	-Collect and trend historical performance data for each service level and KPI outlined in the AMP. **Status Update: AWB tracks KPI performance monthly and reports results internally. AWB continues to expand upon the KPIs tracked and reported.** -Begin tracking measures via graphical reports.	Low	**AWB is currently tracking additional KPIs with Utility Cloud and presenting them through Microsoft Power BI for reporting.**

Phase	Initiative Strategy	Resources (internal/ external)	Task Details	Investment Level	Timeline
			Status Update: Some KPIs are currently tracked using graphical reports. -Define targets where possible for each service level and KPI. **Status Update: Targets have been established for the KPIs that are being tracked.** -Review and refine service level measures **Status Update: Service levels are reviewed and discussed annually by AWB staff and are periodically adjusted. KPIs are used to track the success of meeting the service levels. The Utility Cloud program will help to expand upon what is currently tracked.**		

Phase	Initiative Strategy	Resources (internal/ external)	Task Details	Investment Level	Timeline
Initiative 4 – Enhance Monitoring for Better System Understanding					
Phase 1 - 2	**Strategy 4a** Improved sewer pump station monitoring	AWB	-Continue implementation of the SCADA upgrade program at sewer pump stations, including installation of AWB-owned flow meters. **Status Update:. In recent years updates to the SCADA system at several pump stations have been completed, these include I-90, McCormack, Woodville, and Par Circle, Marlborough Court, and Northern Boulevard. This allows AWB to acquire real time alarm and flow data.** **Floatables Facilities at Orange Street, Quackenbush, and Jackson/Livingston were added to SCADA in 2019. Each of these locations has a sewage pump station and controls for wash down of the screen.** **The AWD transitioned from a third party that hosts Ignition SCADA to their own servers. The**	High	Ongoing **This initial project is complete. AWB plans on completing two pump stations each year and will be complete by 2029.**

Phase	Initiative Strategy	Resources (internal/ external)	Task Details	Investment Level	Timeline
			servers were purchased in 2021, the transition to the new servers was completed in 2022.		
Phase 1	**Strategy 4b** Improved CSO overflow monitoring.	AWB	-Install monitors to quantify wet weather overflows -Install AWB-owned flow meters at regulators that measure flow to the interceptor to enhance confidence in the data and eliminate reliance on the County to properly maintain existing flow meters. **Status Update:** **In 2016, AWB installed Smart Covers at the combined sewer Woodville Pump Station and the dam on the Big C regulator to detect combined sewer overflows.** **In 2017 AWB installed Smart Covers at the combined sewer overflow regulators located at Maiden Lane, Steuben Street, Orange Street, Quackenbush, Jackson Street, and Livingston Avenue Regulators.** **In 2018, the AWB expanded the SmartCover® program. It included the installation of thirteen (13) new data collection sites at existing manholes that integrate with the existing Sewer SCADA system. The project was completed in 2020.** **2019 Hach Flo-Dar Meters were installed in three (3) locations:** • **Big C Regulator- on pipe to ACWPD (36-inch)** • **Big C outfall pipe to the Hudson River** • **Warren Street on the Beaver Creek Trunk, below the site of the Beaver Creek Satellite Treatment Facility.** **A new tide gate and new actuated gate at the Big C Regulator will be completed in early 2025.** **As part of this project, flow meters at Warren Street (total Beaver Creek flow), Green Street (flow to County interceptor) and Rensselaer Street (overflow to River from Big C) will be replaced. The battery operated units will be replaced with utility powered units.**	Low	This initial project is complete. **AWB will continue to install meters with telemetry to better manage the sewer system. All dam structures within the combined sewer system will be completed by 2026.**
	Strategy 4c Improved trunk sewer monitoring.	AWB	-Install AWB flow meters in the trunk sewers to determine dry and wet weather for both flow capacity analysis and to assist in sizing bypass pumping in the event of a break	Low	**This initial project is complete**. AWB will

Phase	Initiative Strategy	Resources (internal/ external)	Task Details	Investment Level	Timeline
			Status Update: In 2016, a Smart Cover was installed on Elberon Place between Quail Street and South Lake to monitor flow level during heavy rains as an early detection system for potential street flooding. **In 2017, AWB installed SCADA on four of the Albany County Water Purification District flow meters, including Russel Road, Pine Bush, South Plant, and I-90.**		continue to update SCADA to better manage the sewer system.

Phase	Initiative Strategy	Resources (internal/ external)	Task Details	Investment Level	Timeline
Initiative 4 – Enhance Monitoring for Better System Understanding – Cont.					
Phase 1	**Strategy 4c** Improved trunk sewer monitoring – Cont.	AWB	**In addition, Smart Covers were installed at Green Street and Orange Street to monitor flows entering the County interceptor, and at Hackett Boulevard Trunk and Fox Creek Trunk for early detection of street flooding.** **In 2019, the AWB installed Smart Covers at thirteen (13) existing manholes that will integrate with the existing Sewer SCADA system. Some of these locations include Albany High School, the Bouck, Lincoln Park Ravine, Myrtle Street, Park Avenue, State Street, Third Avenue, Empire State Plaza, and the Western Avenue/Krumkill Sewer.** **More flow monitoring is proposed in the EFC C4-5402-21-00 funding, which will be pursued with a financing application in 2024. The goal is to identify all the various sources of flow to the South Plant and develop a program to reduce excessive flows.**	Low	
	Strategy 4d Improved CSS and MS4 basin monitoring	AWB	-Install level monitors to better understand how often CSS and MS4 basins are used. - If beneficial based on an evaluation of data obtained from these monitors, consider installing real-time control mechanisms on the CSS and MS4 basin outlets so that outlet size can be adjusted to optimize system storage during storm events **Status Updates: Hansen/Ryckman CSO abatement and Flood Mitigation project – outlet control structures were added to underground stormwater chambers to provide a controlled release of flows back to the combined sewer.** **Opti Adaptive (real time) Controls were installed on Albany High School separate stormwater detention in 2019 and will be used to control discharge.** **Hacket Blvd. Green Infrastructure project included modifications to an existing stormwater detention pond and for the installation of Opti stormwater controls. Project substantially completed in 2024.**	Low Medium	Much of this task has already been completed. Controls on Hackett Blvd and Sheridan Ave trunks are planned substantially completed in 2024. Thurlow Terrace planned for 2025.

Phase	Initiative Strategy	Resources (internal/ external)	Task Details	Investment Level	Timeline
			Thurlow Terrace sewer separation project is planned for 2025. Will include separation of sewer and discharge to Washington Park Lake, which currently has Opti stormwater controls.		
Initiative 5 – Additional System Cleaning					
Phase 1	**Strategy 5a** Add additional crew for sewer cleaning	AWB	-Add additional crew during a second shift to expand the sewer cleaning program beyond the current list of problem areas	Medium	**Completed**
	Strategy 5b Improved Record Keeping of Cleaning	AWB	-Keep an electronic log of when each catch basin and CSS/MS4 basin has been cleaned, rather than just paper-based work orders. This will ultimately be replaced by CMMS system	Low	**Completed**. This data is being collected in Utility Cloud.
Phase 3	**Strategy 5c** Additional catch basin cleaning	AWB	-Increase catch basin cleaning to reach a performance goal for frequency of catch basin cleaning	Medium	AWB has increased catchbasin cleaning to approximately 200/year.

Phase	Initiative Strategy	Resources (internal/ external)	Task Details	Investment Level	Timeline
Initiative 6 – Pump Station Condition Assessments					
Phase 2	**Strategy 6a** Conduct inventory & condition assessment of wastewater pump station equipment	AWB with Consultant Participation	-Review available drawings and each wastewater pump station to develop an initial equipment inventory -Conduct site visits to each station to verify equipment inventory and perform visual condition assessments -Review available maintenance logs and conduct interview discussion with AWB staff to develop performance and consequence of failure scores -Develop estimated, remaining, and adjusted remaining useful life for equipment -Gather life-cycle costs of equipment where available -Develop risk scores and assets and assign assets to CIP groups -Develop a rehabilitation/replacement CIP program for wastewater pump stations -Develop business cases for highest priority projects - Require the vendor that performs generator and pump stations inspections provide inspection data electronically which will eventually be incorporated in the CMMS	Medium	After Strategy 2b AWB has 30 pump stations that are visited frequently and evaluated annually. The formal condition assessments listed here will be completed at the large pump stations by 2025. All pump stations will be completed by 2029.
Initiative 7 – AMP Implementation and Continuous Improvements					
Phase 1	**Strategy 7a** Track implementation of AMP initiatives and schedule monthly Steering Committee meetings to review progress	AWB	Monthly Steering Committee meetings to review progress on AMP initiatives	Low	**This has begun and is occurring monthly.**
	Strategy 7b As data and analysis becomes available, add the information to the AMP. The plan should be reviewed and enhanced yearly.	AWB with Consultant Participation	As sections of the plan are developed add the information to the plan.	Low	This will be completed on an annual basis.

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