VOLUME 2

PENNSYLVANIA-AMERICAN WATER COMPANY

2022 GENERAL BASE RATE CASE
R-2022-3031672 (WATER)
R-2022-3031673 (WASTEWATER)

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WATER

Pennsylvania-American Water Company
ABINGTON

Pennsylvania American Water Company's Abington district provides water service to customers throughout the Boroughs of Clarks Summit, Clarks Green and Dalton; and portions of Waverly, South Abington, North Abington, Scott, and Glenburn and Newton Townships.

SOURCE OF SUPPLY

Abington Well No. 3 is 8 inches in diameter and 240 feet deep. It is located near the Operations Center on Zimmerman St. in Clarks Summit. Pumping facilities consist of a 130 gpm well pump. Water is pumped into the system from an underground concrete detention reservoir.

Abington Well No. 4 is 8 inches in diameter and 599 feet deep. It is located on South Abington Road, Clarks Summit. Pumping facilities consist of a 200-gpm submersible pump and a 200-gpm high service pump. Water is pumped into the system from a 28,000-gallon underground detention reservoir. This well is currently not used and is in a standby status.

Abington Well No. 5 is 10 inches in diameter and 620 feet deep. It is located on North State Street, South Abington Township. Pumping facilities consist of a 150 gpm submersible pump and a 125 gpm vertical turbine high service pump. Water is pumped into the system from an underground detention reservoir.

Abington Well No. 6 is 10 inches in diameter and 565 feet deep. It is located on Hemlock Drive, Clarks Summit. Pumping facilities consist of a 150 gpm submersible pump and a 150 GPM high service pump. Water is pumped to the system from a 2,800-gallon detention tank.

Abington Well No. 7 is 8 inches in diameter and 376 feet deep. It is located on Griffin Pond Road, South Abington Township. Pumping facilities consist of a 200 gpm submersible well pump, a 45,000 gallon clearwell, and five (5) high service pumps of varying capacities from 50 to 100 gpm.

Abington Well No.8 is 8 inches in diameter and 505 feet deep. It is located on Willowbrook Road, South Abington Township. Pumping facilities consist of a 150 gpm submersible well pump and a 160-gpm high service pump. Water is pumped into the system from a 4,000-gallon detention tank.

Abington Well No. 9 is 10 inches in diameter and 620 feet deep. It is located on North Abington Road and Puritan Drive in Abington Township. Pumping facilities consist of a 150 gpm submersible well pump and a 175 gpm high service pump. Water is pumped into the system from a 36" diameter detention pipe.

Pump operation for each of the wells is done through a combination of SCADA, telemetry, and manual control based on the levels in the Clarks Green Standpipes.

Dalton Upper Well, is 8 inches in diameter and 620 feet deep. It is located on Main Street, Dalton. Pumping facilities consist of a 115-gpm submersible pump which discharges into the Dalton Standpipe. Pump operation is pressure controlled from tank elevation. This well is not normally used and is in standby status as an emergency use facility.

The Waverly System is supplied by three (3) drilled wells. Waverly Wells No. 1 & 2 have a combined entry point with a total permitted capacity of 100 gpm Waverly Well No. 4 is a 300'deep well with a permitted capacity of 56 gpm and consists of a submersible pump The Waverly system and Glenburn system are interconnected with the Clarks Summit and Abington systems.

The Abington well supply is supplemented by water delivered by the Scranton Area Filtration Plant. Two (2) 1,000 gpm pumps located in Abington Well No. 6 building deliver the water into the distribution system. Pump operation is SCADA controlled by the level in the Clarks Green Standpipe.

TREATMENT

All of Abington's wells are treated with chlorine for disinfection and zinc orthophosphate for corrosion control. Abington Wells #5, #6, #8, and #9 are treated with polyphosphate to sequester iron and manganese. Abington Well #3 and #6 water is also treated with aeration for the removal of volatile organics and hydrogen sulfide.

All the Wavery Wells No. 1, 2, and 4 and the Upper Dalton well are treated with chlorine for disinfection and zinc orthophosphate for corrosion control.

DISTRIBUTION STORAGE

Distribution storage consists of Clarks Green's two (2) 300,000-gallon welded steel standpipes, 30 feet in diameter and 57 feet high, both located on Highland Avenue, Clarks Summit, and Dalton's 100,000-gallon welded steel standpipe, 27 feet in diameter and 23 feet high, located on West Main Street, Dalton. The Waverly storage tank is a 208,000-gallon glass lined bolted steel standpipe located off of Carbondale Road. Abington West Side tank is a 400,000 elevated tank, approximately 200 feet high, located off Newton-Ransom Road, Newton Twp.

DISTRIBUTION

The West Grove Street, Winola Road Booster Pump stations, and the North Abington Road booster pumping stations supply customers located in two (2) separate residential areas, which are too high to be served from the Clarks Green Standpipe. Facilities at North Abington Road Booster consist of two (2) 300 gpm pumps. Facilities at Winola Road Booster consist of two (2) 360 gpm pumps and one (1) 500 gpm fire pump. Facilities at West Grove Street Booster

consist of two (2) 300 gpm pumps and one (1) 500-gpm-fire pump. The Winola Road and West Grove Street Booster Stations serve the Abington West Side Tank gradient. The Huntington Woods Booster Station serves a small isolated residential system in the Borough of Dalton. This contains two (2) 100 gpm pumps and one (1) 700 gpm fire pumps at this station.

Pennsylvania-American Water Company
BANGOR

The Bangor district provides water service to customers in the Boroughs of Bangor and Roseto, the village of West Bangor, and portions of Washington, Plainfield, and Upper Mount Bethel Townships. The Bangor district is divided into the Bangor main system, and the West Bangor system.

SOURCE OF SUPPLY

Supply to the Bangor main system is from multiple sources that flow to the Bangor Treatment plant prior to entering the distribution system. The treatment plant receives raw water from the 0.92 MG Lower Handelong Reservoir which is located adjacent to the plant and acts as a collecting basin for multiple raw water sources. The West Fork of Martin's Creek flows into the Lower Handelong Reservoir, along with the Handelong Well #2 which pumps directly into the Lower Handelong Reservoir. Additionally, the Stofflet Well, Joseph Handelong Wells 1&2 and the Labar Well are all located offsite and are piped in a common pipeline to the Lower Handelong Reservoir. The Pritchard Well, the Getz Wells 1 and 2, the Oxford Reservoir and the Smith Reservoir are all located offsite and piped directly to the treatment plant in a common pipeline or can also be diverted to the Lower Handelong Reservoir if needed.

Supply to the West Bangor service system is from six wells located just northwest of the village of West Bangor. The six (6) wells have a total permitted capacity of 0.289 MGD. The North Garibaldi Booster Station facilitates the transfer of water from the Bangor main service system into the West Bangor service system. This pump station will supplement the supply from the West Bangor wells when delivery from the wells is inadequate to meet system demands.

TREATMENT

The Bangor system is served by two (2) separate treatment plants, the Bangor Treatment plant and the West Bangor treatment plant.

The Bangor Treatment Plant is located along Route 191 in Upper Mt. Bethel Township and has a reliable treatment capacity of 2.5 MGD. Raw water is transported from the Lower Handelong reservoir to the plant via 10" and 12" mains. Plant influent flow is measured and then chlorine, caustic soda, liquid alum, and a liquid polymer are all added prior to filtration. Treated water then flows into three (3) multi-media filter units designed to filter at a maximum rate of 3.2 million gallons per day. Post treatment chemicals consist of chlorine gas, caustic soda and corrosion inhibitor. Filtered water then flows into a .160 MG clear well where three (3) transfer pumps rated at 1.6 MGD each, one (1) transfer pump rated for 0.8 MGD and one (1) wash water pump rated at 3.2 MGD are located. The transfer pumps deliver water from the clear well to the two (2) 0.5 MG bolted steel Upper Handelong Tank #1 and Tank #2. Water from these tanks then enters the system through 5000' of 16" transmission main.

Treatment of the six (6) West Bangor wells includes chlorination, caustic soda for pH adjustment, and zinc orthophosphate for corrosion control prior to discharge to a contact main

and then the West Bangor Reservoir and distribution system. The total treatment capacity of this facility is 0.289 MGD.

DISTRIBUTION

The Bangor distribution system is divided into four (4) pressure gradients. The Mountain High Service gradient is controlled by the water level in the Upper Handelong Tanks and serves the eastern half of Roseto Borough, and a portion of Washington Township. The Bangor main gradient receives water from the Mountain High Service gradient, is controlled by the Roseto reservoir water level and serves the southeastern section of Bangor. The Chestnut Street Booster Station pumps water from the Bangor main gradient into the Bangor Roseto Tank gradient which is controlled by the Roosevelt St. Elevated Tank and serves the western half of Roseto and Bangor. The North Bangor Booster pump system transfers water from the Mountain High service gradient to the North Bangor gradient which serves a small portion of Upper Mt. Bethel Twp.

The West Bangor distribution system consists of only one (1) pressure gradient and is controlled by the West Bangor finished water reservoir water level. Except for the interconnection with the North Garibaldi Booster Station, the West Bangor distribution system is not connected to the Bangor distribution system.

The Bangor and West Bangor distribution systems both consists primarily of cast iron and ductile iron water mains with isolated sections of PVC and Transite pipe material. There are fire hydrants installed on both distribution systems.

DISTRIBUTION STORAGE

Bangor distribution storage consists of the two (2) 0.5 MG bolted steel Upper Handelong Tank #1 and Tank #2, the 0.80 MG Roseto reservoir in Roseto Borough serving the Bangor main service gradient, and the 0.10 MG Roosevelt Street elevated tank serving the Roosevelt St. Elevated Tank gradient. The West Bangor system is served by the 0.236 MG West Bangor Reservoir.

BERRY HOLLOW WATER

The Berry Hollow Water System of Pennsylvania-American Water Company is part of the Bangor District and supplies potable water to a small residential community in Lower Mount Bethel Township, Northampton County PA.

SOURCE OF SUPPLY

Berry Hollow is a groundwater system that consists of two wells; Well #1 is permitted for 16 gpm, and Well #2 is permitted for 8 gpm. Well #2 is in "reserve" status and not in use.

WATER TREATMENT

There is one treatment building. Raw water is treated with chlorine for disinfection and blended polyphosphate for sequestering manganese. The system has an 8-inch contact main for 4-Log Treatment of Viruses and approximately 11,000 gallons of storage. The building houses metering and chemical feed facilities as well as a high service pumps for maintaining pressure in the distribution system.

DISTRIBUTION

The distribution system is fed by from the high service pumps. The system consists of small diameter plastic main and no fire hydrants.

BERWICK

The Berwick water system serves Berwick, Nescopeck, and Briar Creek Boroughs and Briar Creek and Salem Townships. The estimated population served is 12,880 through approximately 12,783 customer connections.

SOURCE OF SUPPLY

The source of supply consists of four drilled wells capable of a combined delivery of 6.0 MGD.

TREATMENT

Water from the wells is delivered via a 20-inch main to the treatment plant where chlorine and sodium hexametaphosphate are added. Chemical feeds and flow rates are monitored at the Operations Center. The water enters two 10,000-gallon retention vessels designed to provide adequate retention before entering the distribution system via a 20-inch transmission main. Alarm facilities are provided to indicate failure of pumps, chemical feed equipment, or low storage levels. All pumps are operated by automatic level controls from the Glen Brook Storage tanks.

DISTRIBUTION STORAGE

Distribution storage consists of two 0.800 MG steel reservoirs located on Water Dam Road, Briar Creek Township. The levels in these vessels are transmitted to the Operations Center and the Canal Street Station. A manual override permits operation of the pumps from the Canal Street Station. The Salem booster station located off Foundryville Road in Briar Creek Township serves a small high elevation area. Installed in 1967, this station can deliver 0.144 MGD.

BOGGS TOWNSHIP

The Boggs System of Pennsylvania-American Water Company supplies potable water for domestic, commercial, industrial, municipal, and fire protection use for 20 customers in Boggs Township, Centre County.

SOURCE OF SUPPLY

Boggs Well 1 and Boggs Well 2 are both located adjacent to Bald Eagle Creek. Both wells have vertical turbine pumps rated at 50 gpm but capable of supplying more flow depending on water level in the well and tank.

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WATER TREATMENT

The Boggs Treatment Plant can process 0.236 MGD. The filtration and chemical feed equipment, as well as, a lab, office, and garage are housed in a block structure at 875 Old 220 Road, Milesburg in Boggs Township, Centre County.

The raw water from both wells is pumped to the plant. Sodium hypochlorite and a polymer are added to the plant influent, which is monitored for turbidity and residual chlorine. The treatment plant consists of two vessels per stage and two stages, operating in a direct filtration mode. Each filter contains sand media approximately 20 inches deep. Following the first stage of filtration, a polymer is again injected prior to an in-line static mixer. The second stage filters contain approximately 20 inches of sand media. The effluent of each individual filter, raw water, and combined stage effluents are monitored for turbidity. The plant effluent flows through 36" pipe for contact time before it flows to the 0.5 MG elevated storage tank or goes directly to the distribution system.

RESIDUALS HANDLING FACILITIES

The waste water generated by the filter backwashes is collected in the waste water clarifier. The solids (waste residual) settle out and are removed by a contractor. The supernatant water from the wastewater clarifier is recycled to the head of the plant daily.

DISTRIBUTION and STORAGE

The distribution system is fed by gravity from a 0.5 MG tank which provides fire protection storage and pressure. The system is comprised of predominantly 10" DI water main with small sections of 8" DI, 6" PVC, and 2" PVC water main. There is one PRV station in the distribution system and it has a single 10" valve.

BROWNELL/FALLBROOK

The Brownell/Fallbrook areas serve all or portions of Carbondale City, Carbondale, Scott, and Fell Townships, and Jermyn and Mayfield Boroughs, in Lackawanna County.

SOURCES OF SUPPLY

The Brownell system consists of a 245 million gallon (Mgal) upstream supply reservoir, known as Carbondale No. 4 Reservoir, and an 847 Mgal distribution reservoir, known as Brownell Reservoir, both located on Racket Brook. A third reservoir, Carbondale No. 7 Reservoir, not presently owned or controlled by PAWC, lies upstream of Carbondale No. 4 Reservoir on Racket Brook. Total drainage area is 4.0 square miles.

The Fallbrook system consists of a large upstream supply reservoir, known as Crystal Lake and a small downstream 8 Mgal distribution reservoir, known as Fallbrook Reservoir, both on Fall Brook. Total drainage area is 9.7 square miles.

TREATMENT

The **Brownell plant** is located immediately downstream of Brownell Dam adjacent to Route 6 in Carbondale Township. The plant has a rated capacity of 4 MGD. Water supply to the plant is provided by raw water pumping from Brownell Reservoir.

The raw water is pumped from the source of supply directly to the plant where initial pre-chemical additions are made. Pretreatment chemicals include alum, lime, potassium permanganate, activated carbon, and coagulant aid. After pre-chemicals are added, the water passes through rapid mixing units consisting of two in-line static mixers and then into two (2) two-stage flocculation units. The next step in the treatment process consists of granular media filtration. Filters are equipped for air/water washing.

After being filtered, water flows through the plant's clear well where many of the post treatment chemicals such as chlorine for disinfection, lime or caustic soda for pH adjustment, and polyphosphate for corrosion control are added before entering the two (2) - 0.78 Mgal storage tanks on the plant site.

The **Fallbrook plant** is located adjacent to Fallbrook Dam in Carbondale Township. The plant has a rated capacity of 1.6 MGD. Water supply to the plant is provided by raw water pumping from Fallbrook Reservoir.

The raw water is pumped from the source of supply directly to the plant where initial pre-chemical additions are made. Pretreatment chemicals include alum, lime, potassium permanganate, activated carbon, and coagulant aid. After pre-chemicals are added, the water passes through rapid mixing units consisting of one (1) in-line static mixer and then into two (2) two-stage flocculation units. The next step in the treatment process consists of high-rate

clarification with tube settlers followed by granular media filtration. Filters are equipped for water back washing and surface agitation.

After being filtered, water flows through the plant's clear well where many of the post treatment chemicals such as chlorine for disinfection, caustic soda for pH adjustment, and polyphosphate for corrosion control are added before entering the 0.75 Mgal storage tank on the plant site.

On both the plant sites are two (2) lined earthen lagoons used to store filter backwash water and residual solids from the plant's clarification processes. After the wastes have settled, the clear supernatant is recycled back to the plant or discharged into the adjacent stream or reservoir in accordance with an NPDES permit.

DISTRIBUTION

Water flows from the Brownell Water Purification Plant through two (2) 0.78 Mgal storage tanks (overflow elevation of 1,585) to the distribution system through a 24-inch transmission main which divides into three separate mains, one serving higher elevation areas and two with pressure reducing valves serving lower elevation areas of Carbondale. Both a 14" and 16" transmission main delivers water from the Fallbrook Water Purification Plant to the distribution system. Storage at the Fallbrook Water Purification Plant site is comprised of one (1) 0.75 Mgal water tank (overflow elevation of 1,414). The Brownell and Fallbrook service areas merge in Carbondale at a floating divide. Further downstream, two (2) pump stations in series deliver mixed water to the area formerly served by Rushbrook Reservoir. When activated, the Powder Mill Pump Station can also deliver water to the area formerly served by White Oak and Laurel Run Reservoir. This area is currently fed primarily from the Scranton Area Water Purification Plant.

BROWNSVILLE

The Brownsville District serves a population of approximately 9,200 people in Fayette and Washington Counties, including: the Boroughs of Brownsville, West Brownsville, California, Coal Center, and the Townships of Brownsville, Luzerne, Jefferson, and Redstone and West Pike Run. Currently, the Brownsville Plant delivers up to 1.5 MGD to the Uniontown District via a 16-inch transmission main and booster station installed in 1998 and 2000, respectively, to connect the two districts. An emergency connection with North Fayette Municipal Authority provides a two-way metered feed. Up to 0.5 MGD can flow in either direction.

SOURCE OF SUPPLY

The Brownsville Water Treatment Plant is located at 17th Street, Brownsville, Pennsylvania. The Monongahela River is the sole source of supply for the treatment plant. Two reservoirs in West Virginia, the Tygart Reservoir and Lake Lynn, in conjunction with a series of locks and dams, regulate the flow in the Monongahela River. The Pennsylvania Department of Environmental Protection has determined that the available water at the Brownsville intake is 193 MGD. The allocation permit allows PAWC to withdraw up to 3.1 MGD. The permit was issued in 2014 and is valid for a period of 25 years.

PLANT DESCRIPTION

The Brownsville Water Treatment Plant consists of an intake, raw water pump station, conventional flocculation and settling basins and filters, and a finished water pump station. The Brownsville plant can produce up to 3.1 MGD with all filters in service. Treatment facilities at the plant provide coagulation, flocculation, sedimentation, and filtration of the surface supply, with pH adjustment, disinfection with gaseous chlorine and addition of a zinc-orthophosphate corrosion inhibitor. Improvements to filters, pipe gallery, and utilizing Hiller Reservoir as the clear well were completed in 1999.

The raw water pump station, located near the Monongahela River draws water through its intake into the deep-well. From the deep-well, the water is pumped through a metered 16-inch raw water pipeline to the chemical feed building located approximately 25 feet away. Pretreatment chemicals are injected into this main and mixed through an in-line static mixer located in the vault beneath the chemical feed building. The 16-inch raw water pipeline leads to the influent side of the flocculation basins where it splits into two 12-inch inlet pipes, one going to each 38,000-gallon flocculation basin. Each basin consists of two flocculator chambers. Located on the effluent side of each flocculation basin is a 122,620-gallon sedimentation basin. As the treated water nears the end of each sedimentation basin, it cascades into v-notched weirs and flows into the common 20-inch influent pipeline in the east pipe gallery. This pipeline delivers the treated water to each of the six dual-media filters located in the filter building. The six filters have a combined capacity of 3.1 MGD @ 2 gpm/ft^2. As the water goes through each filter, it collects into one main effluent that leads into the clearwell and high service pump well. Post-treatment chemicals are fed into the clearwell. This well has a capacity of approximately 118,500 gallons and the water is pumped through a dedicated 16-inch transmission pipeline to

the 3.5 MG Hiller Reservoir providing the plant significant detention time for post treatment disinfectant. An ammonia feed station at the Hiller Reservoir can provide chloramination as required for control of disinfection by products.

Filters are backwashed based on run-time, loss of head, and turbidity. The backwash sequence is initiated by draining the filter and opening two 12-inch PRV valves located in east pipe gallery which take water from the dedicated 16-inch transmission pipeline to Hiller Reservoir. The wastewater is sent to the waste water building vault via a 12-inch pipeline. The water is allowed to settle for two hours before the supernatant is decanted to the river. PAWC possesses a NPDES permit that allows the supernatant to be discharged to the river.

The SCADA system plays a crucial role in the operation of the plant. This system gives the user the ability to monitor and control all facets of the treatment process, i.e., pump control, the amount of chemicals fed, filter backwash sequence, and monitoring all on-line instruments. SCADA computers are located in the microbiology lab, the filter building, and the main office building.

TREATMENT RESIDUALS

Water treatment plant residue (sludge) is generated by filter backwash water and by cleaning the sedimentation basin. Backwash water, filter-to waste water, and sedimentation residuals are discharged to a 100,000-gallon, rectangular concrete holding tank where suspended solids are allowed to settle. A motorized control valve is operated to decant the supernatant discharges to the Monongahela River by gravity. After decanting is completed, submersible sludge pumps are operated to pump settled residue to the Brownsville Sewer Authority Wastewater Treatment Plant.

DISTRIBUTION STORAGE

Distribution storage consists of the covered 3.5 MG in-ground concrete Hiller Reservoir that has a hypalon rubber liner and cover, the 0.43 MG steel standpipe California Tank, the 0.127 MG Aquastore glass lined Allison Tank, the 0.18 MG welded steel Daisytown Tank (not being used as of 2021) and 0.500 MG Rt. 88 Tank.

DISTRIBUTION

Two high service pumps each have a capacity of 2.9 MGD at 461 TDH each. The system has two booster pump stations, the Brownsville Station with 2.1 MGD capacity and the Route 88 Station with 1.2 MGD capacity: and seven (7) PRV’s.

BUTLER

The Butler area serves the City of Butler; the Borough of East Butler; Connoquenessing Borough and Saxonburg Borough; and portions of Butler, Center, Connoquenessing, Forward, Franklin, Oakland, Penn, Clinton and Summit Townships. The estimated population served is 44,600.

SOURCE OF SUPPLY

Source of supply is obtained from impoundments on the Connoquenessing Creek, Thorn Run Dam and the Allegheny River. Main sources of water are Connoquenessing Creek and Thorn Run. In addition, a 16-inch waterline from the Pennsylvania American Water Ellwood System is available to supply up to an additional 2 MGD as needed.

There are two impounding reservoirs located on 792 acres of land. They are Oneida with a capacity of 452.6 million gallons (MGA); and Thorn Run with a capacity of 138.7 MGA.

Lake Oneida Dam is an earthen embankment structure, which was rehabilitated in 2012-2013. The improvements include a new reinforced concrete primary spillway and roller compacted concrete embankment for overtopping protection. The maximum height of the dam is 38 feet and it has a length of 875 feet. The dam contains a concrete corewall which is cast on top of a steel sheetpile cutoff wall. The dam was originally constructed in 1918. The PADEP imposes a minimum release requirement in the creek downstream of the dam.

Thorn Run Dam is an earthen embankment structure, containing a reinforced concrete primary spillway and roller compacted concrete embankment overtopping protection. The maximum height of the dam is 39 feet high and it has a length of 660 feet. The dam contains a concrete corewall which is reportedly cast on top of a timber sheetpile cutoff wall. The dam was originally constructed in 1903 and was rehabilitated in 2010-2011. The PADEP imposes a minimum release requirement in the creek downstream of the dam.

Water taken from the Allegheny River at Brady's Bend is pumped through 11.5 miles of 16-inch waterline. It goes to either the Oneida watershed or to the Thorn Run watershed, where it is discharged into two stream beds and flows into the reservoirs. A metering station was installed in 1992 on the 16" line near the discharge points to the reservoirs to comply with a D.E.P. requirement to measure and control the flows from the Allegheny River to Lake Oneida and Thorn Run water sheds.

In 2016, both the East Brady and Kaylor Pump Stations were upgraded, consisting of installing an additional electrically driven pump at the East Brady location and installing 2 new electrically driven pumps at the Kaylor location.

TREATMENT

The water from Oneida Reservoir flows by gravity through a 24" main to the Oneida Valley Plant. Water from the Thorn Run Reservoir flows by gravity through two mains, one of which is 16" and the other 24", to a junction point with a 24" main from Oneida Reservoir.

The Oneida Valley Treatment Plant located on Pennsylvania State Route 38 has a capacity of 12.0 mgd. Potassium Permanganate is added at the gate houses of Oneida and Thorn Run Reservoir. Water from the reservoirs enters the raw water sump by gravity. It is then pumped from the raw water sump to the treatment units. Pre-chlorine is added between the raw water sump and the treatment units. Pre-lime, alum coagulant, and carbon are added in the raw water sump.

The plant has three Aldrich type purification units, each consisting of a steel tank 76 feet in diameter containing concentric steel shells, which provide separate compartments for flocculation, clarification and filtration. The filter compartments contain anthracite, sand and ilmenite media supported on gravel. Filter aid is added on top of the filters. From the treatment units the water flows by gravity to a 710,000 gallon clearwell where post-lime and post-chlorine are added. A project to renovate each of the three purification units was started in 1996 and was completed in 1998.

In 1989, a Supervisory Control and Data Acquisition System (SCADA) was installed at the Oneida Valley Treatment Plant. This system provides instant access of information for the entire operating system and focuses that information to a computer screen located at the plant. In 1993, chemical containment was added to surround all chemical storage tanks and feeders to prevent the accidental release of water treatment chemicals.

DISTRIBUTION STORAGE

There is a 150,000 gallon elevated tank on the North Hills High service system and a 150,000 gallon elevated tank on the South Hills high service system. There are two 250,000 gallon elevated tanks on the West End high service system, a 135,000 gallons reservoir on the East Butler system, a 250,000 gallon elevated tank on the Oak Hills high service system, and a 250,000 gallon elevated tank on the Lick Hill (Summit Twp.) high service system. There is also 475,000 gallon standpipe in the Center Township system as well as a 250,000 gallon elevated tank in Connoquenessing System. There are also two tanks serving the Saxonburg system; the welded steel 250,000 gallons Saxonburg Elevated Tank and the elevated steel 400,000 gallons Victory Road Elevated tank.

The Main Service system has a 2,000,000 gallon lined and covered reservoir and a 2,500,000 gallon ground storage tank. The reservoir is equipped with two pumps which can pump water into the North Hills system.

DISTRIBUTION

The distribution system is divided into eight service areas: The Main Service system, North Hills high service system, South Hills high service system, the East Butler system, the West End high service system, Oak Hills high service system, Lick Hill (Summit Twp.) high service system, and Center Township high service system. Also, there are two smaller booster systems serving a section of Portman Road and a portion of the system off Freeport Rd. south of Butler.

The North Hills high service system is supplied by the choice of 2 electrically driven pumps located at the North Butler booster or by 2 electrically driven pumps located at the North Hills booster.

The South Hills/Saxonburg high service system is supplied by four electrically driven pumps located at the Saxonburg Booster Station.

The East Butler system is supplied by 2 electrically driven pumps located at the East Butler booster station.

The West End high service system is supplied by the New Castle Road Booster Station, which contains three electrically- driven pumps. This station has a diesel-driven generator that provides power in the event of a power outage. The West End high service system can also be supplied through the 16" interconnection with the Pennsylvania American Water Ellwood System using the Swain Hill booster.

The Oak Hills high service system is supplied by 3 electrically driven pumps located in the Oak Hills booster station. This station was retrofitted in 2016/2017 with all new pumps and electrical equipment.

The Lick Hill (Summit Twp.) high service system is supplied by 2 electrically driven pumps located at the Lick Hills booster station,

The Center Township high service system is supplied by 3 electrically driven pumps located at the Oneida Valley plant. 2 of these pumps can be operated during power outages using the plant emergency generator.

The Main Service system is supplied by four pumps located at the Oneida Valley Plant. Three of the pumps are driven by electric motors and the fourth can be driven by either electric motor or diesel engine.

Two Mobile generators are available to provide secondary power in the event of power outage through transfer switch connections installed at all the boosters.

The Mt. Chestnut high service system is supplied by 4 electrically driven pumps located in the Mt. Chestnut Booster Station. This station has an emergency generator capable of operating 2 of the pumps in case of a power outage.

The Whitestown Road high service system is supplied by 4 electrically driven pumps located in the Whitestown Road Booster Station. This station has an emergency generator capable of operating 2 of the pumps in case of a power outage.

WASTE WATER FACILITIES

Sludge created during the treatment process is discharged automatically directly to the Butler Area Sewer Authority. Solids from the backwash water are settled in a concrete holding tank and pumped to the sewer authority following recycling of the backwash water.

CEASETOWN/WATRES

The Ceasetown area serves all or portions of Ashley, Courtdale, Edwardsville, Larksville, Plymouth, Pringle, Shickshinny, Sugar Notch, Laurel Run and Warrior Run Boroughs; Conyngham, Hanover, Hunlock, Plymouth, Newport, Union Salem, Wilkes-Barre, and Jackson Townships; Nanticoke and Wilkes-Barre Cities in Luzerne County. Watres serves people in all or portions of Avoca, Dupont, Duryea, Hughestown, Laflin, and Yatesville Boroughs; Jenkins, Pittston, Plains, and Wilkes-Barre Townships; and the cities of Pittston and Wilkes-Barre City.

SOURCES OF SUPPLY

The Ceasetown system consists of two interrelated sources of supply on the Pikes Creek and Harvey's Creek watersheds. The primary source of supply on the Pikes Creek watershed is the Pikes Creek (or Chenery) Reservoir. Rice Dam (also known as the Harvey's Creek Canal Headworks) is the primary withdrawal location on the Harvey's Creek watershed. Harvey's Lake, upstream of Rice Dam, is a recreational facility and not a source of water for PAWC.

Rice Dam is a 3.2-million-gallon (Mgal) supply reservoir located on Harvey's Creek with a 20 square mile drainage area, which includes Harvey's Lake. Water released from Rice Dam flows through the Harvey's Creek Canal to the raw water pumping station for the Ceasetown Water Purification Plant. Raw water can either be pumped directly to the water purification plant, the Pikes Creek Reservoir, or both. The decision where to pump Harvey's Creek water is based on the storage level of Pikes Creek Reservoir and the water quality of Harvey's Creek. During periods of less than satisfactory water quality in Harvey's Creek or when sufficient storage levels exist in the Ceasetown Reservoir, water is not withdrawn from Rice Dam through the Harvey's Creek Canal.

Pikes Creek Reservoir is a 2.94 Bgal supply reservoir with an 11.1 square mile drainage area. A 42-inch pipeline transmits water directly from the Pikes Creek Reservoir to the Ceasetown Water Purification Plant. Water leaving the treatment process flows through the 2.8 Mgal and 1.5 Mgal finished water storage tanks (overflow elevation of 1,016.5) and 42-inch transmission main to two delivery points to the distribution system. Overflow and releases from Pikes Creek Reservoir flow in Pikes Creek to the Pikes Creek Canal Headworks located immediately downstream. At the Pikes Creek Canal Headworks, water is collected from Pikes Creek and the Harvey's Creek Canal. Overflow from the Pikes Creek Canal Headwork's discharges into Harvey's Creek.

The Watres system consists of three independent but interconnected sources of supply. The Watres Reservoir is a 1,943 Mgal supply reservoir, which primarily supplies water to the Watres Water Purification Plant via the Gardner Creek Pump Station. Gardner Creek Reservoir is a 74 Mgal standby reservoir with a drainage area of 3.5 square miles. It can be introduced into the raw water supply mains to the Watres Water Purification Plant by pumps located at the Gardner Creek Pump Station. The third source, Mill Creek Reservoir, is a 616.7 Mgal supply reservoir with a drainage area of 3.0 square miles. Raw water from this source is intermixed with

the Gardner's Creek/Watres supplies at the flow control chamber for the Watres Water Purification Plant. Water leaving the Watres Water Purification Plant flows through two (2) 1.6 Mgal finished water storage tanks (overflow elevation of 1,074).

TREATMENT

The Ceasetown plant is located approximately one mile downstream of Pikes Creek Dam along Route 29 in Jackson Township, Luzerne County. The plant has a rated capacity of 16.0 M.G.D. Water supply to the plant is provided by either gravity or pumping from either the Pikes Creek Reservoir and/or the Harvey's Creek Canal Headwork's (Rice Dam).

The raw water is delivered by either gravity or pumping from the sources of supply directly to the plant where initial pre-chemical additions are made. Pretreatment chemicals include alum, lime, potassium permanganate, activated carbon, and coagulant. After pre-chemicals are added, the water passes through rapid mixing units consisting of two (2) basins in series with mixers. The next step in the treatment process consists of contact clarification units followed by granular media filtration. Filters are equipped for air/water washing.

After being filtered, water flows through the plant's clear well where many of the post treatment chemicals such as chlorine for disinfections, lime or caustic soda for pH adjustment, and polyphosphate for corrosion control are added before entering the 2.8 Mgal storage tank and the 1.5 Mgal storage tank on the plant site.

The Watres plant is located near the junction of Westminster and Jumper Roads in Plains Township, Luzerne County. The plant has a rated capacity of 16.0 M.G.D. Water is supplied by gravity to the plant from Watres and/or Mill Creek Reservoirs and raw water pumping from Gardner's Creek Reservoir.

The raw water is delivered by gravity or pumping from the source of supply directly to the plant where initial pre-chemical additions are made. Pretreatment chemicals include alum, lime, potassium permanganate, activated carbon, and coagulant. After pre-chemicals are added, the water passes through rapid mixing units consisting of two (2) basins in series with mixers. The next step in the treatment process consists of contact clarification units followed by granular media filtration. Filters are equipped for air/water washing.

After being filtered, water flows through the plant's clear well where many of the post treatment chemicals such as chlorine for disinfections, lime or caustic soda for pH adjustment, and polyphosphate for corrosion control are added before entering the two (2) - 1.6 Mgal storage tanks on the plant site.

DISTRIBUTION

The first delivery points from the Ceasetown Water Purification Plant is the 18-inch transmission main in the vicinity of the Pikes Creek Canal Screen Chamber Intake. The system serves customers located in Nanticoke, Hanover Township, Newport Township, Shickshinny, Mocanaqua (Conyngham Twp.) and portions of Hunlocks and Plymouth Townships. The service area ranges in elevation from 520 to 890 feet and is served by five distribution pump stations and three distribution storage tanks area historically fed by PAWC Pine Run reservoir; comprising portions of Warrior Run, Sugar Notch, Ashley, and Hanover Townships, via the Sugar Notch booster pump station and the 1.0 Mgal Sugar Notch distribution storage tank, and Wilkes-Barre Township via Georgetown pump and 0.5 Mgal distribution tank.

The second delivery point from the Ceasetown Water Purification Plant is through the 42-inch transmission main to the 5.0 Mgal Plymouth Tank (overflow elevation of 993). Water is delivered from the Plymouth Tank through a 36-inch transmission main. The system serves people in Plymouth Borough and surrounding municipalities and in downtown and South Wilkes-Barre. It intermixes with water delivered from the Ceasetown 18-inch transmission main and the Watres Water Purification Plant. Its service area ranges in elevation from 520 to 956 feet and is served by five distribution-pumping stations and four distribution storage tanks. Service is provided to the area historically fed by Pine Run Reservoir; comprising portions of Warrior Run, Sugar Notch, Ashley, and Hanover Township; via the Sugar Notch booster pump station and the 1.0 Mgal Sugar Notch distribution storage tank. An interconnection point exists between the Ceasetown and Hillside supplies at the Courtdale pump station facility.

Water leaving the Watres Water Purification Plant's finished water storage tanks flow by gravity through transmission mains on Westminster Road to serve areas of Jenkins Township, Laflin Borough, and the lower portion of Plains Township. In addition, water flows south through 16-inch and 24-inch mains on Jumper Road and serves Wilkes-Barre, Plains Township and Wilkes-Barre Township. The N.P.W. pump station, located on Jumper Road, delivers water to the Two (2) N.P.W. Tanks (overflow elevation 1,251) which provide a total storage volume of 0.76 Mgal to the East Mountain Business Park. There are additional small booster stations that serve small areas.

Water is also delivered to the higher elevation areas historically served solely from Watres Reservoir through the finished water pumps located at the Gardner's Creek Pump Station. From the pump station, transmission lines link the two (2) 0.75 Mgal Old Boston water storage tanks (overflow elevation of 1,355) to the 10-inch Suscon main in Pittston Township and the 14-inch Old Boston main in Jenkins Township. Water can be transferred from the higher gradient Watres service area to portions of the Nesbitt service area through pressure regulating facilities. There are also other small booster stations that serve small areas.

WASTE WATER FACILITIES

On the Watres plant site is an equalization basin, a plate settler building, and eight (8) sand drying beds utilized to separate and dewater residual solids from the plants backwash and clarification processes. Supernatant and filtrate is recycled to the plant influent. The Watres

plant operates as a zero-discharge plant although it does have an NPDES permit for discharge, if needed.

On the Ceasetown plant site are two lined earthen lagoons used to store residual solids of the filter backwash water. After the wastes have settled, the clear supernatant is either recycled to the plant influent or discharged into the adjacent stream, in accordance with the NPDES permit.

CLARION

The Clarion area serves the Boroughs of Clarion, Shippenville, Sligo and Strattanville; and portions of Clarion, Elk, Limestone, Knox, Monroe, Paint, Piney and Farmington Townships. The estimated population served is 11,600.

SOURCE OF SUPPLY

The system utilizes the Clarion River as its source of supply.

TREATMENT

Raw water from the Clarion River flows by gravity from two different intakes into a collection well where potassium permanganate and, as river water quality necessitates, powder activated carbon are added. This water is then pumped using three (3) vertical turbine raw water pumps to the head of the treatment process located at the top of the adjacent hill. As this water enters the facility, polyaluminum chloride or liquid alum, caustic, polymer and chlorine, are added. The water then enters one or both of the (2) two Actiflo treatment trains rated for 3 mgd each.

The treatment process using the Actiflo treatment trains consists of coagulation, injection, maturation and tube settling. Coagulant, in the form of polyaluminum chloride, is added before the Actiflo unit, and at the unit, sand and polymer are injected into the mixed water to enhance the coagulation process. Maturation and tube settling are accomplished immediately following the sand and polymer addition. Filtration is conducted via three dual media (anthracite and sand), rated for 2 mgd each.

After passing through the filters, the water enters the common filter effluent line where, caustic soda and chlorine, is added before entering the 0.440 MG finished water clearwell storage. Chlorine, hydrofluosilicic acid, corrosion inhibitor and ammonia are added in the common clearwell effluent line, which is the suction line for the high service pump station.

The solids removed from the filters are backwashed into one of (3) lagoons. Decant water from these gravity flows to a concrete wastewater holding tank from which discharge is made to the Clarion River under and NPDES permit issued by the Department of Environmental Protection. It is planned that the residue from the retention lagoons and wastewater tank will be haul offsite to either a landfill or a beneficial use end-user.

DISTRIBUTION STORAGE

There are two main service 500,000 gallon elevated tanks, Town Tank and Paint Tank. The Clarion Township gradient has a 310,000 gallon standpipe and the Sligo gradient has a 250,000 gallon standpipe.

DISTRIBUTION

There are three distributive pumps in the pumping station located adjacent to the clearwell to pump finished water to the distribution system. Two 12 inch transmission mains supply water to the main service gradient grid system. The Clarion Township booster has two pumps which deliver water to the Clarion Township gradient. The Paint Township Booster Station has four pumps that pump water to the Farmington Township Municipal Authority. The Ridge Street booster is located in the Sligo gradient and serves about 10 customers in an elevated portion of that gradient. In addition, water is transmitted through two pressure reducing stations (Reidsburg and Sligo) to the Sligo area and the Elk Township PRV station serves the Shippenville and Elk Township portions of the system.

WASTE WATER FACILITIES

Filter backwash and actiflo return solids flow by gravity to one of three wastewater holding lagoons where the solids are allowed to settle before the clear supernatant is returned to the stream. The settled sludge is allowed to dry and the de-wasted material is removed and is typically land applied as a soil amendment for beneficial use.

Pennsylvania American Water Company
Coatesville Water System Description

PAWC – Coatesville District serves the City of Coatesville, the Boroughs of South Coatesville and Parkesburg, and portions of the Townships of Caln, East Fallowfield, Sadsbury, West Sadsbury, West Caln and Valley Township, Chester County. Also includes portions of the Townships of Sadsbury, Bart, Eden and Colerain and the Borough of Quarryville. The water system is divided into ten (10) pressure zones. There is an interconnection between the Coatesville pressure zones (low and high) and the Brandywine Pump Station via manually operated street valves. There is also an interconnection between the West Chester Road Pump Station service area and Caln Township via manually operated valves located in vaults.

SOURCE OF SUPPLY

The water source for the district is the West Branch of the Brandywine Creek and supplemented by Chambers Lake. The water is treated at the Rock Run Water Treatment Plant and pumped into the system through parallel 18" and 20" water mains. The 18" water main flows directly into the Brandywine Pump Station which pumps the water into a 24" water main for distribution east, towards Caln Township, and west to Parkesburg. The 20" water main provides service to Coatesville City low pressure zone.

PARKESBURG SYSTEM

The water traveling west to Parkesburg flows into a 5.0 million gallon reservoir. The Parkesburg Pump Station draws water from the reservoir and pumps directly into a 24" water main which travels west into the Mars Hill Storage Tank. The Wright Street Pump Station draws water from 24" water main to feed the Parkesburg Elevated Storage Tank (0.1 mg). The storage tank provides domestic and fire flow to a small residential area in the northern portion of Parkesburg Borough. The Mars Hill Tank (2.0 mg) provides domestic and fire flows to a rural portion of the service area west of Parkesburg Borough. The water from the Parkesburg Reservoir also flows east to Caln Township area to provide domestic and fire flows via a 24" water main.

COATESVILLE SYSTEM

The Rock Run Water Treatment Plant pumps (7.0 MGD) water into the system through parallel 18" and 20" water mains. The 20" water main flows directly into Coatesville City. The city is divided into two (2) pressure zones. The low pressure zone is serviced directly through water pumped from the water treatment plant. This pressure zone provides service to residential, commercial and industrial customers in an urban area. The low pressure system also provides water to the Mt. Pleasant Street Storage Tank (2.0mg) and the Glendale Avenue Storage Tank (1.0 mg). The Mt. Pleasant Street Pump Station draws water from the Mt. Pleasant Street Storage Tank which serves a residential area in Coatesville City and Valley Township. The high pressure zone is served through the 4th Avenue Pump Station which takes suction from the low pressure

zone. The 4th Avenue Pump Station pumps to the North Hill Tank (0.5 mg). The North Hill Tank, via a pressure regulating valve, provides water to the South Hill Tank (0.25mg).

EAST FALLOWFIELD TOWNSHIP SYSTEM

The South Hill Tank provides water to the West Chester Road Pump Station which provides domestic and fire service to a residential area in East Fallowfield Township. This is a closed system. There is an interconnect between the East Fallowfield Township System and Caln Township, which is served via the Parkesburg Reservoir.

INTERMEDIATE SERVICE AREA

There are two (2) pump stations which draw directly from the 24" water main between Parkesburg Borough and Coatesville City. The Strasburg Pump Station provides domestic and fire flows to a small residential area in East Fallowfield Township. This is a closed system. The AIM Pump Station pumps to the AIM Elevated Storage Tank (0.25mg). The tank provides domestic and fire flows to an area comprising of residential, commercial and industrial customers in Sadsbury Township. The tank also provides water to the Rt. 340 Pump Station. This pump station pumps to the Hill Road Tank (0.2mg) which serves residential customers in West Caln Township.

CONNELLSVILLE

The Connellsville area serves the City of Connellsville; South Connellsville Borough; Connellsville Township; and a portion of Bullskin Township. The estimated population served is 11,450.

SOURCE OF SUPPLY

The Connellsville area purchases all its water requirements from the Municipal Authority of Westmoreland County, the North Fayette County Municipal Authority, the Pleasant Valley Water Authority and the Indian Creek Valley Water Authority.

There are six connections through which the purchases occur. The first is located on Cramer Avenue approximately 130 feet west of Hyndman Street in South Connellsville. This is a 12-inch connection with two 4-inch meters. The second connection is an 8-inch with a 4-inch meter and is located in Royal Alley midway between Perry Street and Wayne Street in the City of Connellsville; there also a second 8 connection in Royal Alley with 3 - 4" meters. The fourth connection is 6-inch and is located at the intersection of 5th and Wine Streets in South Connellsville with one 4-inch and one 1-inch meter. This is an 8-inch connection with a 6-inch meter. The fifth connection to Pleasant Valley Water Authority is 6-inch with a 2-inch meter and is located on Breakiron Road in Bullskin Township. The sixth connection is a 6-inch connection to the Indian Creek Valley Water Authority on Springfield Pike.

EMERGENCY CONNECTIONS

There are three emergency connections for this system. One is 12-inch and is located at the end of Sullivan Alley in South Connellsville. The other is 6-inch at the intersection of West Crawford Avenue and South Twelfth Street. The third connection is to North Fayette Country Municipal Authority and is located along Morrell Avenue (Route 119).

DISTRIBUTION STORAGE

The system has one standpipe and two reservoirs. The Joint High School Reservoir has a capacity of 0.158 million gallons. The two Gibson reservoirs owned by the Municipal Authority of Westmoreland have a capacity of 5.0 million gallons and 2.5 million gallons.

DISTRIBUTION

The Joint High School Tank service system is supplied by 4 electrically driven pumps located in the Snyder Street Booster Station. This station has an emergency generator capable of operating 2 of the pumps in case of a power outage. The Springfield Pike service system is supplied by 2 small pump stations in series that each have 2 electrically driven pumps.

CRYSTAL LAKE

The Crystal Lake area serves all or portions of Fairview, Rice and Wright Townships in Luzerne County. The estimated population served is 10,000.

SOURCE OF SUPPLY

The Crystal Lake system consists of two interconnected sources of supply located on adjacent watersheds. Bear Creek Intake is a stream intake with a 36 square mile drainage area located approximately one mile downstream of Bear Creek Lake on Bear Creek, a tributary of the Lehigh River. Water can be pumped from the Bear Creek Intake at a nominal maximum rate of 13 million gallons per day into Crystal Lake. The DEP water allocation permit limits total pumpage from Bear Creek into Crystal Lake to 1,095 million gallon per year and requires that a minimum stream flow of 35.9 cubic feet per second must be maintained downstream of the Bear Creek Intake. Crystal Lake, located on Wapwallopen Creek, is a 2.54-billion-gallon distribution reservoir with a 3.3 square mile watershed and an overflow elevation of 1,942.54 feet. Two water transmission mains connect Crystal Lake Reservoir to the Crystal Lake Water Purification Plant.

TREATMENT

The Crystal Lake plant is located approximately one-half mile downstream of Crystal Lake Dam in Bear Creek Township. The plant has a rated capacity of 6.5 million gallons per day. Water supply to the plant is gravity from the Crystal Lake Reservoir.

The raw water is delivered by gravity from the source of supply directly to the plant where initial pre-chemical additions are made. Pretreatment chemicals include alum or polyaluminum chloride, lime, potassium permanganate, activated carbon, and coagulant. After pre-chemicals are added, the water passes through rapid mixing units consisting of two basins in series with mixers and then into flocculation units consisting of four basins with two stage horizontal reels. The next step in the treatment process consists of granular media filtration. Filters are equipped for air/water washing.

After being filtered, water flows through the plants clear well where many of the post treatment chemicals such as chlorine for disinfection, lime or caustic soda for pH adjustment, and polyphosphate for corrosion control are added before entering the two (2) 1.0-million-gallon storage tanks on the plant site.

DISTRIBUTION

Water leaving the Crystal Lake Water Purification Plant flows through the two (2) 1.0 million gallon finished water storage tanks and 12-inch, 14-inch, and 20-inch transmission mains to serve people in the Mountain Top area. The Crystal Lake service area ranges between 1224 and 1,700 feet in elevation. Most customers are served through pressure reducing valves. The 1.0-million-gallon Crestwood Tank (overflow elevation of 1,680 feet) provides storage to the regulated service area within the Crestwood Industrial Park.

Water can also be delivered to the service area historically fed by Pine Run Reservoir through a 16-inch transmission main. This service area comprises portions of Warrior Run, Sugar Notch, Ashley, and Hanover Township. This service area, which is primarily fed from the Ceasetown supply area, contains the Sugar Notch booster pumping station and the 1.0-million-gallon Sugar Notch distribution storage tank.

WASTEWATER FACILITIES

On the plant site are two lined earthen lagoons used to store residual solids of the filter backwash water. After the wastes have settled, the clear supernatant is either recycled to the plant influent or discharged into the adjacent stream, in accordance with an NPDES permit.

ELLWOOD CITY

The Ellwood City Plant serves the Boroughs of Ellwood City and Ellport, and portions of Perry and Wayne Townships and New Beaver Borough in Lawrence County; the Borough of Koppel and portions of North Sewickley, Franklin Township, and Big Beaver Borough in Beaver County; and portions of Jackson and Lancaster Townships in Butler County. The estimated population served is 16,610. The Ellwood system is also interconnected with the PA American Water Butler system and the Evans City Municipal Authority. There are also two connections with the North Sewickley Township Municipal Authority. One connection serves a small portion of the North Sewickley system while the other is an emergency connection.

SOURCE OF SUPPLY

The Ellwood Water Treatment Plant obtains its water supply from two locations near the confluence of the Connoquenessing Creek and Beaver River. The Connoquenessing intake consists of four (4) submerged half barrel screens and the Beaver River intake consists of two (2) submerged full barrel screens. The screens are cleaned periodically with a burst of air from the compressed air system in the Raw Water Pump Station. Piping from both intakes convey water by gravity to the bottom of the Raw Water Pump Station on the water treatment plant site. Water is then pumped to the treatment plant via three (3) vertical turbine pumps equipped with variable speed drives.

TREATMENT

The Ellwood Water Treatment Plant is located at 352 Industrial Park Drive in New Beaver Borough. The plant has a rated capacity of eight (8) million gallons per day (MGD). Water from the Raw Water Pump Station can be treated with sodium permanganate, an oxidizer chemical, at the Raw Water Pump Station or in the first flash mix chamber prior to the contact basins at the Water Treatment Plant. Powdered activated carbon can also be fed into the first flash mix chamber and the contact chambers allow for adequate reaction time of the carbon prior to coagulant addition. Other “pre” chemical additions of coagulant and lime or caustic soda are made in the last flash mixer after the contact basins. Raw water then flows into three (3) treatment trains each having three (3) stage variable speed horizontal paddle wheel flocculators and sedimentation basins with inclined plate clarifiers. Clarified water is conveyed to four (4) dual cell filters. The filters are conventional units with multimedia including several layers of gravel, sand, and granular activated carbon. After filtration, the water is conveyed through two (2) UV treatment units for cryptosporidium inactivation. The UV treatment units can also be utilized for taste and odor control in an Advanced Oxidation Process with the addition of hydrogen peroxide. After UV treatment, sodium hypochlorite is added for disinfection and caustic can be added for pH adjustment prior to entering the two (2) clearwell chambers that are operated in series. Final treatment chemicals (corrosion inhibitor, caustic, aqua ammonia) are added at a static mixer as the water is conveyed from the clear well to three (3) horizontal high

service pumps that pump to the distribution system. Two (2) wash water pumps provide water from the clearwell to backwash the filters.

DISTRIBUTION STORAGE

The welded steel 3.0 MG Aiken Avenue Reservoir and welded steel 0.5 MG West End Reservoir provide storage for the Ellwood main gradient. The welded steel 0.317 MG Franklin Township Standpipe and the 0.538 MG Aquastore glass lined Swain Hill Tank provides storage in the Franklin/Jackson gradient. In addition, the (two) 0.15 MG welded steel Forest Hills (Skyline) Standpipes and the 0.30 MG Wiley Hill Elevated Tank provide storage to their respective gradients.

DISTRIBUTION

The Ellwood City distribution system is comprised of a main service gradient for the borough, and 5 smaller gradients surrounding the borough. The Fox BPS supplies water to the Skyline tank gradient northeast of main service, Bridge Street BPS supplies the Bridge Street pressure sustaining gradient northwest of main service, the Wiley Hill BPS supplies the Wiley Hill tank and gradient south of the main service, and the Mecklem PS supplies the Franklin Township tank and gradient southeast of the borough and Jackson Township and Lancaster Townships in Butler County. Two additional gradients are served from the Franklin Gradient, The RT 19 BPS and the Ridge Road pressure sustaining gradients in Lancaster and Jackson Townships in Butler County.

WASTE WATER FACILITIES

Settled sludge is removed from the bottom of the treatment sedimentation basins via submerged sludge collectors and conveyed to the sludge thickener tank. Filter backwash wastewater is conveyed to one of two (2) wastewater clarifiers. Supernatant from the clarifiers is discharged via the NPDES outfall to the Beaver River. Sludge from the clarifiers is conveyed to the sludge thickener. Solids in the sludge thickener are dewatered with two (2) centrifuges in the Dewatering Building and dewatered solids conveyed to trucks or dumpsters. The sludge from the water treatment plant is approved for beneficial land reuse.

FOREST CITY

The Forest City areas serve all or portions of Clinton Township, Fell Township, Forest City and Vandling Boroughs in Susquehanna and Wayne Counties.

SOURCES OF SUPPLY

This system consists of three sources of supply, two located on the Lackawanna River and one on the tributary Brace Brook watershed. The primary withdrawal point is the Stillwater Intake located about 6,000 feet downstream of Stillwater Flood Control Reservoir. Stillwater Flood Control Reservoir has a normal operating capacity of 200 million gallon (Mgal), of which 65 Mgal of storage is dedicated for water supply purposes. Water is released to the Lackawanna River and picked up at the Stillwater Intake, which has a total upstream drainage area of 37 square miles. Raw water then flows by gravity through a 30-inch main from Stillwater Intake to the Forest City Water Purification Plant. A secondary point of withdrawal is located downstream on the Lackawanna River at the Forest City Intake Reservoir, adjacent to the water purification plant. Water must be pumped from this intake reservoir to the water purification plant. The Brace Brook Reservoir is a single 4.4 Mgal standby supply reservoir located on Brace Brook with a 2.1 square mile drainage area.

TREATMENT

The Forest City plant is located adjacent to Forest City Pump Intake along the Lackawanna River in Forest City Borough, Susquehanna County. The plant has a rated capacity of 1.0 M.G.D. Water supply to the plant is provided by gravity from Stillwater Intake or raw water pumping from Forest City Pump Intake.

The raw water is delivered by either gravity or pumping from the sources of supply directly to the plant where initial pre-chemical additions are made. Pretreatment chemicals include alum, lime, potassium permanganate and coagulant aid. After pre-chemicals are added, the water passes through rapid mixing units consisting of one (1) in-line static mixer and then into flocculation units consisting of one (1) basin with two staged horizontal reels. The next step in the treatment process consists of sedimentation followed by granular media filtration. Filters are equipped for conventional water washing.

After being filtered, water flows through the plant's clearwell where many of the chemicals such as chlorine for disinfection, lime for pH adjustment, and polyphosphate for corrosion control are added.

DISTRIBUTION

Treated water is pumped to the system through a 12-inch finished water transmission main. The pump station is located at the Forest City Purification Plant and consists of two (2) variable speed pumps rated at 800 gallons per minute each, together with associated valves and appurtenances. The distribution system contains one 0.75 Mgal distribution storage tank with an overflow elevation of 1,828. Pump operation is controlled indirectly by the level of the storage

tank. An interconnect pump station on Day Street in Fell Township can deliver Brownell water to the Forest City system if needed. PRV and pumps, also in this station, allow Forest City water to be sent to parts of the Brownell service territory if needed.

WASTE WATER FACILITIES

On the plant site are two (2) lined earthen lagoons used to store filter backwash water and sludge from the plant's clarification processes. After the wastes have settled, the clear supernatant is discharged into the adjacent stream in accordance with an NPDES permit.

FRACKVILLE

The Frackville water system serves the Borough of Frackville and adjacent territory in West Mahanoy, Butler, New Castle Townships, and portions of Mahanoy and Walker Townships. The estimated population served is 5,583 through 2,316 customer connections.

SOURCE OF SUPPLY

Source of supply consists of 5 wells. Source of supply for the Center Street water treatment plant (WTP) is four drilled wells. One additional drilled well is located at the Nice Street WTP. The total system 30-day average withdrawal limit is 1.0 million gallons per day. Nice Street well and Center Street WTP wells 1 and 2 are in reserve status.

TREATMENT

Treatment at the Center Street WTP consists of water from up to four wells being pumped to a 33' x 5'9" diameter aeration tower equipped with two (2) 5,200 CFM air blowers. Water from the aeration tower is discharged into a 0.029 MG concrete clearwell. Chlorine, caustic soda (for pH adjustment), and a corrosion inhibitor are added prior to the clearwell.

Treatment at the Nice Street WTP consists of water from the one well being pumped to a 28' x 3' diameter aeration tower equipped with a 1,000 CFM air blower. Water from the aeration tower is discharged into a 0.011 MG concrete clearwell where chlorine and a corrosion inhibitor are added.

All processes at both facilities are automatically monitored for flow, chemical feed status, and pressure. All parameters are transmitted to the Operations Center via a SCADA system.

DISTRIBUTION STORAGE

Distribution storage consists the main service reservoir an industrial park standpipe. The main service reservoir is a 0.335 MG circular concrete tank with a hypalon liner and a floating cover. It is north of West Pine Street between Sixth and Seventh Streets in Butler Township. The industrial park standpipe is a 0.5 MG steel storage tank located in the Frackville Industrial Park and serves as storage for higher elevations of the system.

DISTRIBUTION

Water is pumped to the distribution system from the Center Street WTP and the Nice Street WTP. At the Center Street WTP water flows through a 12-inch main to the main pump building where three high service pumps, each with a capacity of 0.576 MGD deliver water to the distribution system. The pumps are controlled by main service reservoir level via the SCADA system.

At the Nice Street WTP, water from the clearwell is delivered to the distribution system by a 150 GPM vertical turbine high service pump.

The Morea Road pumping station has a capacity of 0.547 MGD and supplies the Industrial Park area and higher elevations of the system drawing from the main service gradient. This station's operation is controlled by the water level in the Industrial Park Tank.

Pennsylvania American Water Company
Glen Alsace Water System Description

PAWC – Glen Alsace serves the Townships of Exeter Township and Amity Township in Berks County. The Golden Oaks satellite system serves homes on a golf course community in Ruscombmanor Township, Berks County.

SOURCE OF SUPPLY

The primary source of supply is the groundwater wells and interconnects with neighboring municipalities. In Exeter Township, there are seven wells; three located at East Neversink Road in Exeter Township, one at Fairmount Drive Exeter Township and three at Butter Lane Exeter Township. Surface water supply from Reading Water Authority is located at 19th and Woodvale in Reading. There are two interconnects with Mount Penn Water Authority (Groundwater wells) one site is at Siedel Street and Levan Street. The second site is at Bingaman Street and Route 562. In Amity Township five wells are located at Nicholson Ave, Old Swede Road, Timberline Drive, Rosecliff Drive, and Levingood Rd. Golden Oaks Wells #1 and #2 are pumped into a treatment station on the same property. The water is treated and flows into ground level storage tank which is used for pumped storage. The system is controlled through SCADA at the Glen Alsace warehouse.

The Reading Municipal Water Authority Interconnection is an 8-inch line capable of providing 2.0 million gallons per day. This interconnect supplies water to Neversink Tank # 2. The Mount Penn Water Authority Interconnection (Neversink zone) is a 3-inch meter capable of providing approximately 250,000 gallons per day. This interconnect supplies water to Neversink Tank # 1. Mount Penn Water Authority Interconnection (Artesian zone) is a 2-inch meter capable of providing approximately 250,000 gallons per day. This interconnect supplies water to Church Lane Road Tank #1.

DISTRIBUTION SYSTEM

The distribution system consists of eight ground level storage tanks and six water booster stations. All the SCADA is monitored at the Glen Alsace warehouse.

Neversink Tank #1 has a capacity of 210,000 gallons. This Steel tank acts as ground water storage to maintain pressure in the Neversink Zone service gradient of the distribution system.

Neversink Tank #2 has a capacity of 250,000 gallons. This Steel tank acts as storage from the RAWA Interconnect and maintains the tank level in Neversink Tank #1.

Grant Street Tank #1 has a capacity of 500,000 gallons. This Steel tank acts as ground water storage to maintain pressure in the Grant Street and Grant Street Low service gradients of the distribution system.

Grant Street Tank #2 has a capacity of 1,000,000 gallons. This Steel tank acts as ground water storage to maintain pressure in the Grant Street and Grant Street Low service gradients of the distribution system.

Church Lane #1has a capacity of 300,000 gallons. This Concrete tank acts as ground water storage to maintain pressure in the Church Lane and Church Lane Low gradients of the distribution system.

Green Briar Tank #1 has a capacity of 500,000 gallons. This Steel tank acts as ground water storage to maintain pressure in the Lincoln Road/Greenbriar gradient of the distribution system.

Green Briar Tank #2 has a capacity of 1,500,000 gallons. This Concrete tank acts as ground water storage to maintain pressure in the Lincoln Road/Greenbriar gradient of the distribution system

Butter Lane Tank has a capacity of 200,000 gallons. This Steel tank acts as ground water storage to maintain pressure in the Butter Lane service gradient of the distribution system

HERSHEY

PAWC's Hershey system serves the Borough of Palmyra and portions of the Townships of Annville, North and South Annville, North and South Londonderry, all in Lebanon County. In Dauphin County, portions of the Townships of South Hanover, West Hanover, Londonderry, Conewago and Derry including the village of Hershey are served. The estimated population served is 48,135.

SOURCE OF SUPPLY

Water is taken from the Manada and Swatara Creeks. Supply is also purchased from the City of Lebanon at the east end of the distribution system.

WATER TREATMENT

The Gerald C. Smith Water Treatment Plant is located approximately two miles north of the town of Hershey near the confluence of the Manada and Swatara Creeks in South Hanover Township. The plant has a rated capacity of eleven (11) million gallons per day (MGD). Water can be withdrawn from either or both of the two stream sources. Up to five MGD can be withdrawn from an impounding reservoir formed by a dam on the Manada Creek. After passing through an intake and traveling screen, raw water from the Manada Creek is pumped with two submersible pumps. Up to eleven (11) MGD can be withdrawn from the Swatara Creek. After passing through an intake and a traveling or stationary screen, raw water from the Swatara Creek is pumped with three vertical turbine pumps. The raw water is pumped from the two sources directly into the plant where initial "pre" chemical additions are made. After these chemicals are added, the water passes through a static mixer and then into a chamber where slower mixing can take place with a mechanical mixer. The water enters adjoining distribution chambers where further chemical additions can take place before entering into a vacuum chamber where the water is lifted and released to create a pulsating action. The water then enters one of five "superpulsator" clarifiers where inclined plates along with the pulsating action combine to accelerate solids contact and allow for uniform accumulation in a "blanket". Excess solids accumulate in a trough and are periodically siphoned out.

The clarified water (above the blanket) enters a perforated pipe that leads into a flume that distributes the flow into one of five filters. The filters are conventional units with multimedia including several layers of gravel, sand, and granular activated carbon. After being filtered, the water is piped through a chamber where final "post" chemical additions are made before entering a two million gallon clear well. A project to incorporate UV treatment after the filters and before the clearwell is underway and expected to be complete in 2022. The water is pumped out of a sump adjoining the clear well with three high service turbine pumps into the distribution system. Two wash water pumps provide water from the clearwell to backwash the filters.

DISTRIBUTION STORAGE

There are five storage vessels in the distribution system. The North (Hershey) Reservoir has a capacity of 2,000,000 gallons, South (Hershey) Reservoir has a capacity of 3,000,000 gallons, Annville Tank has a capacity of 750,000 gallons and Mt. Alem Reservoir (S.W. Derry Twp.) has a capacity of 500,000 gallons. Water from a 150,000 gallon Westford tank (W. Hanover Twp.) is stored and re-pumped into the distribution system.

DISTRIBUTION SYSTEM

The South Reservoir booster station supplies customers at high ground elevation in southwest Derry Twp. This is a completely automatic system consisting of three vertical turbine pumps, together with their associated valves and appurtenances, housed in an above ground structure. Pump operation is controlled by the water level in the Mt. Alem Reservoir.

The Mt. Alem booster station supplies customers located at high ground elevation east and south of the Mt. Alem Reservoir. Pumping facilities consist of two end suction centrifugal pumps, one of which operates continuously, together with their associated valves and appurtenances, housed in an underground enclosure.

The Ridge Road booster station supplies customers at high ground elevation north and east of Ridge Road in N. Londonderry Twp. This is a completely automatic system consisting of four end suction centrifugal pumps, one of which operates continuously, together with their associated valves and appurtenances, housed in an above ground structure.

Country Squire Booster station supplies customers in Country Squire Estates in S. Londonderry Twp., east of the village of Campbelltown. This is a completely automatic system consisting of three end suction centrifugal pumps, one of which operates continuously, together with their associated valves and appurtenances, housed in an above ground structure.

Westford booster station and the Westford Tank comprise a pumped storage system to supply customers in W. Hanover Twp. This is a completely automatic system, which includes three end suction centrifugal pumps, and a control valve housed in an above ground structure. The control valve allows water to fill the Tank by gravity from the Hershey system at night and is pumped out during the day.

A Pressure Reducing Valve (PRV) station located on Railroad St. in Annville controls pressure and flow which maintains adequate levels in Stienmetz Reservoir and Meyer's tank. Another Pressure Reducing Valve (PRV) station located along Route 422 east of Annville controls pressure and flow of purchased water from the City of Lebanon.

College View Heights Booster Station supplies customers in Horseshoe Pike in North Annville Township. This is a completely automatic system consisting of two turbine centrifugal pumps, together with three hydropnumatic tanks, associated valves and appurtenances. All of these are housed in an underground enclosure.

RESIDUALS HANDLING FACILITIES

Residuals from the filter back washing and sludge from the super pulsator clarifier is piped into one of two earthen lagoons. After the wastes have settled, the clear supernatant is discharged into the Swatara and Manada Creeks, in accordance with the company's NPDES permit.

HILLCREST

The Hillcrest water system provides service to approximately 49 residential customers in portions of Kingston Township. The supply consists of one (1) 6-inch well with depth of 490 feet. The well's average daily output of 9,000 gallons per day is pumped to the two (2) 1,950-gallon Polyethylene storage tanks located the Hillcrest well site. Water is disinfected with sodium hypochlorite and treated with bi-metallic phosphate for iron and manganese sequestration at this location prior to delivery to the customers. The distribution system consists of 2-inch through 8-inch ductile iron water mains. There are no fire hydrants installed on this system.

HOMESITE WATER SYSTEM

The Homesite water system provides service to customers in a portion of Dallas Borough. The supply consists of one (1) 6-inch well with depth of 179 feet. The well's average daily output of 4,355 gallons per day is pumped to the 6,150 gallon polyethylene storage tank located at the Homesite well site. Water passed through an air-stripping unit prior to disinfection with chlorine and delivered to the customers. The distribution system consists primarily of 8-inch ductile iron mains. There are no fire hydrants installed on this system.

Pennsylvania-American Water Company
INDIAN ROCKS WATER

The Indian Rocks Water System of Pennsylvania-American Water Company is part of the Pocono district and supplies potable water for domestic and municipal use for customers in Salem Township, Wayne County.

SOURCE OF SUPPLY

The Indian Rocks is a groundwater system that consists of three (3) active wells.

Well No. 1, which has a permitted capacity of 20 gpm (28,800 gpd).
Well No. 4, which has a permitted capacity of 27 gpm (38,880 gpd)
Well No. 5, which has a permitted capacity of 20 gpm (28,800 gpd).

WATER TREATMENT

The production facilities for the Indian Rocks system consists of two treatment buildings. At each treatment building the well water is disinfected with chlorine and metered.

DISTRIBUTION STORAGE

Distribution storage is provided by a 212,000 gallon ground storage tank and two hydro pneumatic tanks with a capacity of 500 gallons each.

DISTRIBUTION

The distribution system is made up of approximately 12 miles of PVC water mains and approximately 4 miles of ductile iron water main. There are no fire hydrants on the distribution system. The distribution system is divided into two (2) pressure gradients. The one gradient is pressurized by booster pumps that draw water out of the 212,000 gallon storage tank. The second gradient is pressurized by the well pump and hydro-pneumatic tanks. A standby booster pump station is ready to pump from the one gradient to the other in the event of well pump failure.

INDIANA

The Indiana area serves the Borough of Indiana; and portions of Armstrong and White Township. The estimated population served is 22,360.

SOURCE OF SUPPLY

The Two Lick Creek is the area's source of supply. The intake consists of two (2) submerged half barrel screens. The screens are cleaned periodically with a burst of air from the compressed air system in the Raw Water Pump Station. Piping from the intake conveys water by gravity to the Raw Water Pump Station on the water treatment plant site. Water is then pumped to the treatment plant via three (3) pumps.

TREATMENT

Water from Two Lick Creek is pumped directly to three Aldrich purification units, each having a nominal capacity of 2.0 mgd. Pre-filtration chemical treatment includes chlorine for disinfection and iron/manganese oxidation; liquid lime for pH adjustment; ferric chloride for coagulation; a non-ionic polymer for sludge blanket control; and powered activated carbon for taste and odor control. The points of application are the raw water influent line in the chemical vault.

Post-filtration chemical treatment includes additional chlorine application as well as hydrofluosilicic acid for fluoridation and caustic soda for corrosion control. The points of application are the filter effluent line in the chemical vault.

DISTRIBUTION STORAGE

The McHenry Hill storage tanks have a capacity of 2.75 million gallons. The distribution system also has the West End tank, a steel ground level tank with a capacity of 680,000 gallons. A third storage tank, the Pleasant Hills tank, is an elevated tank with a capacity of 300,000 gallons.

DISTRIBUTION

The finished product passes to Clearwell #2 which has a capacity of 728,000 gallons and then to Clearwell #1 with a capacity of 152,000 gallons. The finished water is pumped from the clear well by means of four high service pumps, two rated at 1,100 gpm and the other two at 1,600 gpm. Water is also pumped from the pumping station to the McHenry Hill ground level storage tank and the West End ground level storage tank or directly into the distribution system through 12” cast iron and 16” ductile iron mains.

Five booster stations serve the system. One is located at the Pleasant Hills tank with a capacity of 0.360 mg. There are also booster stations for the Oak Hill Estates development and the Campus Crest development with rated capacities of 300 gpm each. The White’s Woods booster station has a rated capacity of 174 gpm in the distribution system. The West End booster

station has a rated capacity of 250 gpm and is used to operate the West End tank as pumped storage.

WASTE WATER FACILITIES

Filter backwash and hydrotreator blow-down solids flow by gravity to one of two wastewater holding lagoons where the solids settle before the clear supernatant is returned to the stream. The settled sludge is allowed to dry, and the de-wasted material is removed and is typically land applied as a soil amendment for beneficial use.

KANE

The Kane area serves the Borough of Kane and a portion of Wetmore Township. The estimated population served is 4,780.

SOURCE OF SUPPLY

The area's source of supply is from seven wells and eight springs. The supply from the springs flows by gravity into the raw water sedimentation basin. The basin is divided into a spring water section and a ground water section and also includes a lower section that is lined and covered. The seven wells have electric motors. An additional well is used as a monitoring well. The discharge from all wells is first aerated then flows into the groundwater section of the reservoir. Normally, water flows from the spring water section into the groundwater section and then into the lower section of the raw water reservoir and is then pumped through the pressure filters into a .255 MG ground level clearwell tank and a .107 MG ground level clearwell tank.

TREATMENT

Caustic soda and chlorine are fed into the groundwater section of the sedimentation basin for pretreatment; polymers fed into filter influent water to aid in filter performance. Chlorine, fluoride, corrosion inhibitor and caustic soda are fed into the combined filter effluent line between the filters and the clearwell to complete treatment. A Supervisory Control and Data Acquisition System (SCADA) controls the treatment process and plant flows.

DISTRIBUTION

The distribution pumps feed the system through two 10 inch mains.

DISTRIBUTION STORAGE

The Clay Street tanks consist of a 26.5 foot diameter by 100 feet high standpipe and an elevated tank with a combined capacity of 1 MG float on the system. The level is maintained by the SCADA system that controls the distribution pumps.

WASTE WATER FACILITIES

Filter backwash flows by gravity to a wastewater holding tank where the solids are allowed to settle before the clear supernatant is returned to the stream. Settled sludge from the wastewater holding tank is transported to the nearby Kana Area Wastewater Treatment Plant for final disposal.

KITTANNING

The Kittanning area serves the Boroughs of Kittanning and Applewold, and portions of Manor and Rayburn Townships. The estimated population served is 5,250.

SOURCE OF SUPPLY

The source of supply is the Allegheny River. Water is pumped by two centrifugal motor-driven low service pumps to the plant raw water basin.

TREATMENT

At the plant, hydrated lime, ferric chloride, chlorine (sodium hypochlorite), caustic soda, powered activated carbon and chlorine may be added as the water passes through an in-line mixer, in the chemical vault, and enters the treated raw water basin. Chlorine and caustic soda may be fed as the water flows by gravity into the sedimentation basin. Chlorine may be applied in the settled water, immediately prior to filtration. Water then flows, by gravity, to three dual media filters having a total capacity of 2.66 MGD. Hydrofluorosilic acid, caustic soda and chlorine are fed prior to the clearwell. The clearwell consists of two baffled chambers that are 134,050 gallons each. A project to incorporate UV treatment after the filters and before the clearwell is underway and expected to be complete in early 2022.

DISTRIBUTION STORAGE

All storage in the system is contained within the approximately .900 MG concrete storage chambers adjacent to the clearwell at the plant.

DISTRIBUTION

Water flows from the clearwell compartments to two (2) storage chambers with a total volume of 0.900 MG. Water is delivered to the system from these storage compartments by gravity through a 20" pipe then to 14" and 16" pipe to the distribution system. Corrosion inhibitor is added after the clearwell chambers for distribution system corrosion control.

Three booster pump stations are located in the Kittanning system. The Orchard Station booster station is located in the northern extremity of the distribution system. The Troy Hill Booster Station serves Troy Hill and parts of East Kittanning in Rayburn Township. The Edgewood Booster Station serves the Typewriter Hill Area located on South Jefferson Street at the southernmost extremity of the system.

WASTE WATER FACILITIES

Filter backwash flows by gravity to a wastewater holding tank where the solids are allowed to settle before the clear supernatant is returned to the river. Settled sludge from the wastewater holding tank, raw basin and settling basin is removed annually. The sludge is typically land applied as a soil amendment for beneficial use.

LAKE HERITAGE

Pennsylvania-American Water Company's Lake Heritage system serves the private community of Lake Heritage, which includes portions of the Townships of Mt. Joy, Mt. Pleasant and Straban in Adams County southeast of Gettysburg, PA. The water system serves an approximate population of 2198, some of which are seasonal.

SOURCE OF SUPPLY

Water is withdrawn from two wells, identified as #1 and 2A. Water is pumped from one or both wells with identical 15 H.P. multi-stage submersible pumps with a rated capacity of 150 gpm or 216,000 gpd each. Pumps are controlled by system pressure, a lead-lag operation, with only one well pump typically required to meet or exceed system demand.

WATER TREATMENT

Water pumped from one or both wells is treated in a nearby chemical control building with a sodium hypochlorite solution for disinfection. Liquid diaphragm chemical feed pumps start with well pumps and inject solution into the water before entering 260 feet of 24" main, which provides detention time before entering the distribution system.

DISTRIBUTION STORAGE

One 60,000 gallon elevated standpipe floats on the system and provides water pressure.

DISTRIBUTION

The system consists of 13 miles of 4", 6", and 8" mains.

The Longstreet booster station supplies customers at high ground elevation in the northwest portion of the distribution system. This is a completely automatic system consisting of three vertical multistage pumps, one of which operates continuously. Each pump rated at 60gpm together with their associated valves and appurtenances are housed in an underground enclosure.

LAUREL RIDGE

The Laurel Ridge water system serves the Laurel Ridge residential development along Morea Road in Frackville with estimated population served of 105. The Laurel Ridge water system also supplies water to the Gilberton power plant.

SOURCE OF SUPPLY

Source of supply for the Laurel Ridge water system is a purchased water system interconnection from Schuylkill County Municipal Authority (SCMA).

TREATMENT

This system currently utilizes purchased water from SCMA. The water is supplied from SCMA Laurel Run Reservoir Filtration Plant. Since Laurel Ridge is a consecutive system, there are no production facilities associated with it.

DISTRIBUTION STORAGE

The Laurel Ridge distribution system does not include storage. The Laurel Ridge water system benefits from two SCMA tanks located on the south side of Route 81 West of Exit 124W.

DISTRIBUTION

The Laurel Ridge distribution system consists of 4,470 feet of 6” and 8” mains and 7 public fire hydrants.

Pennsylvania-American Water Company
Lehman Pike

The Lehman Pike Service Area consists of 10 different water systems: Blue Mountain Lakes, Birch Acres, Mid Monroe (Country Club of the Poconos), Saw Creek Estates, Pine Ridge, Wild Acres, Marcel Lakes, Milford Landing, Fernwood, and All Seasons.

Blue Mountain Lakes (PWSID # 2450133) water system is located mainly in Stroud Township, Monroe County with a small portion in Smithfield Township, Monroe County.

Birch Acres (PWSID # 2450019) water system is located in Smithfield Township, Monroe County. The Birch Acres system is part of the Mid Monroe (Country Club of Pocono's) system via approximately 15,000 feet of 12-inch DICL main, under PWSID #2450119.

Mid Monroe (County Club of the Poconos) (PWSID # 2450119) water system is located in Middle Smithfield Township, Monroe County.

Saw Creek Estates (PWSID # 2520062) water system is located mainly in Lehman Township, Pike County, and a small portion located in Middle Smithfield Township, Monroe County. Water from Saw Creek Estates also supplies the Rustic Acres and Winona Lakes and Mountain Top Estates developments by means of pipeline extensions/interconnections with these developments. Rustic Acres is located in Lehman Township, Pike County and Winona Lakes and Mountain Top Estates are located in Middle Smithfield Township, Monroe County.

Pine Ridge Community (PWSID # 2520096) water system is located in Lehman Township, Pike County.

Wild Acres Lakes (PWSID # 2520034) water system is located in Delaware Township, Pike County.

Marcel Lakes Estates (PWSID # 2520035) water system is located in Delaware Township, Pike County.

Milford Landing (PWSID # 2520085) water system is located in Westfall Township, Pike County.

Fernwood (PWSID # 2450134) water system is located in Middle Smithfield Township, Monroe County.

All Seasons (PWSID # 2520056) water system is located in Delaware Township, Pike County.

SOURCE OF SUPPLY

Water is supplied through a network of 30 active groundwater wells, all located within the confines of the respective developments.

Blue Mountain Lakes - BML Well No. 1 is an 8-inch diameter well drilled to a depth of 541 ft. with a current permitted pumping capacity of 275 GPM, but is currently operated at 100 GPM. Treated water from the well is pumped into a chlorine contact main before entering the distribution system.

Blue Mountain Lakes – BML Well No. 2 is an 8-inch diameter well drilled to a depth of 598 ft. with a permitted pumping capacity of 64 GPM. Treated water from the well is pumped into a chlorine contact main before entering the distribution system.

Blue Mountain Lakes – BML Well No. 3 is an 8-inch diameter well drilled to a depth of 597 ft. with a permitted pumping capacity of 170 GPM. Treated water from the well is pumped into a chlorine contact main before entering the distribution system.

Birch Acres Well #2 is a 6-inch diameter well drilled to a depth of 52 ft with a permitted capacity of 50 GPM. Treated water from the well enters the distribution system after going through a 2,000 gallon above ground hydro-pneumatic tank.

Birch Acres Well #3 is a 6-inch diameter well drilled to a depth of 75 ft with no reported yield. This well is for emergency purposes only and we must notify PADEP if used.

Mid Monroe (Country Club of the Poconos CCP) Well #1 is an 8-inch well drilled to a depth of 300 ft. with a permitted capacity of 123 GPM. This well is equipped with a submersible well pump sized to delivery 123 GPM. Raw water is pumped from this well to the Wells 1&2 Treatment Facility where it is blended with Well #2 raw water, and then treated, via pressure filtration, for Iron & Manganese. Treated water flows through a contact main prior to entering the distribution system.

Mid Monroe (Country Club of the Poconos CCP) Well #2 is an 8-inch well drilled to a depth of 500 ft. with a permitted capacity of 40 GPM. The well is equipped with a submersible well pump sized to deliver 40 GPM. Raw water is pumped from this well to the Wells 1&2 Treatment Facility where it is blended with Well #1 raw water and then treated, via pressure filtration, for Iron & Manganese. Treated water flows through a contact main prior to entering the distribution system.

Mid Monroe (Country Club of the Poconos CCP) Well #3 is an 8-inch well drilled to a depth of 753 ft with a permitted capacity of 65 GPM. Raw water from this well is pumped to the Wells 3&5 Treatment Facility, where it is blended with raw from Well #5, and then treated for Iron and Manganese via polyphosphate sequestration. Treated water flows through a contact main prior to entering the distribution system.

Mid Monroe (Country Club of the Poconos CCP) Well #5 is an 8-inch well drilled to a depth of 805 ft. with a permitted capacity of 65 GPM. Raw water from this well is pumped to

the Wells 3&5 Treatment Facility, where it is blended with raw from Well #3, and then treated for Iron and Manganese via polyphosphate sequestration. Treated water flows through a contact main prior to entering the distribution system.

Saw Creek Estates Well No. 1 was drilled to a depth of 300 feet, and has a permitted capacity of 190 GPM. Treated water from Well No. 1 pumps into a chlorine contact main before entering into the 6-inch plastic transmission main connecting directly to the distribution system. The well pump is controlled by the water level in Tank #5.

Saw Creek Estates Well No. 2 was drilled to a depth of 275 feet, is cased to 51 feet and has a permitted capacity of 190 GPM.

Saw Creek Estates Well No. 3 was drilled to a depth of 150 feet, is cased to 61 feet, and has a permitted capacity of 155 GPM.

Saw Creek Estates Well No. 4 was drilled to a depth of 150 feet, is cased to 60 feet and has a permitted capacity of 75 GPM.

Saw Creek Estates Well No. 5 was drilled to a depth of 250 feet, is cased to 61 feet, and has a permitted capacity of 45 GPM. This well has not been used in several years and is in reserve status.

Saw Creek Estates Well No. 6 was drilled to a depth of 75 feet, is cased to a depth of 55 feet and has a permitted capacity of 90 GPM. . Raw water from this well is pumped via a 4-inch ductile iron main to an Iron & Manganese treatment facility located at Well No. 7.

Saw Creek Estates Well No. 7 was drilled to a depth of 500 ft., is cased to a depth of 52 ft., and has a permitted capacity of 205 GPM.

Saw Creek Estates Well No. 9 was drilled to a depth of 247 ft., is cased to a depth of 52 ft. and has a permitted capacity of 70 GPM. Currently, this well is not being used due to poor water quality issues.

Saw Creek Estates Well No. 10 was drilled to a depth of 63 feet and cased to a depth of 52 feet. A six-inch diameter gravel packed brass screen was installed from 52 ft. to 62 ft. Currently, this well is not being used due to poor water quality issues.

Saw Creek Estates Well No. 10a was drilled to a depth of 92 ft and has a permitted capacity of 400 GPM. An eight-inch diameter gravel packed stainless steel screen was installed from 30 ft. to 92 ft.

Saw Creek Estates Well No. 12 was drilled to a depth of 605 ft., is cased to a depth of 65 ft., and has a permitted capacity of 45 GPM. This well has not been used in several years and is in reserve status.

Pine Ridge Well 1 is an 6-inch diameter well drilled to a depth of 220 ft. with a permitted capacity of 30 GPM. This well is not being used at this time due to poor water quality issues.

Pine Ridge Well 2 is an 6-inch diameter well drilled to a depth of 748 ft. with a permitted capacity of 74 GPM. Treated water from this well pumps into a chlorine contact main before entering the distribution system.

Pine Ridge Well 3 is an 8-inch diameter well drilled to a depth of 550 ft. with a permitted capacity of 58 GPM. Treated water from this well pumps into a chlorine contact main before entering the distribution system.

Pine Ridge Well 4 is an 8-inch diameter well drilled to a depth of 705 ft. with a permitted capacity of 65 GPM. Treated water from this well pumps into a chlorine contact main before entering the distribution system.

Pine Ridge Well 5 is an 8-inch diameter well drilled to a depth of 700 ft. with a permitted capacity of 100 GPM. Treated water from this well pumps into an Iron & Manganese treatment facility and chlorine contact main before entering the distribution system.

Wild Acres Lakes Well #2 is an 8-inch diameter well drilled to a depth of 443 ft. with a permitted capacity of 100 GPM. Treated water from this well pumps into a chlorine contact main before entering the distribution system.

Wild Acres Lakes Well #3 is an 8-inch diameter well drilled to a depth of 650 ft. with a permitted capacity of 43 GPM. Treated water from this well blends with treated water from Well #4 and then enters the storage tank before entering the distribution system.

Wild Acres Lakes Well #4 is an 8-inch diameter well drilled to a depth of 500 ft. with a permitted capacity of 37 GPM. Treated water from this well blends with treated water from Well #3 and then enters the storage tank before entering the distribution system.

Wild Acres Lakes Well #5 is an 8-inch diameter well drilled to a depth of 525 ft. with a permitted capacity of 150 GPM. Treated water from this well then enters a buried chlorine contact tank before entering the storage tank and distribution system.

Marcel Lakes Well #1 is an 8-inch diameter well drilled to a depth of 1,000 ft. and with a capacity of approximately 40 GPM. This well is an emergency stand-by well that is not in use at this time because of other wells being used within this development.

Marcel Lakes Well #2 is an 8-inch diameter well drilled to a depth of 915 ft. and with a capacity of approximately 40 GPM. This well is an emergency stand-by well that is not in use at this time because of other wells being used within this development.

Marcel Lakes Well #3 is an 8-inch well drilled to a depth of 454.5 ft. with a permitted capacity of 150 GPM. Treated water from this well blends with treated water from Well #4 and then enters the below grade clear well for chlorine contact time before entering the distribution system.

Marcel Lakes Well #4 is an 8-inch well drilled to a depth of 451.5 ft. with a permitted capacity of 150 GPM. Treated water from this well blends with treated water from Well #3 and then enters the below grade clear well for chlorine contact time before entering the distribution system.

Milford Landing Well #3 is an 8-inch well drilled to a depth of 164 ft. with a permitted capacity of 52 GPM. Treated water from this well blends with treated water from Well #5 and then enters the storage tank before entering the distribution system.

Milford Landing Well #5A is an 8-inch well drilled to a depth of 211 ft. with a permitted capacity of 178 GPM. Treated water from this well blends with treated water from Well #3 and then enters the storage tank before entering the distribution system.

Fernwood Well #3 is a 10 inch diameter well drilled to the depth of 168 feet with a permitted capacity of 100 GPM. Raw water from this well is pumped to the Wells 3&6 treatment facility. Treated water from this well enters a contact main prior to entering the distribution system.

Fernwood Well #6 is an 8 inch diameter well drilled to the depth of 185 ft with a permitted capacity of 50 GPM. Raw water from this well is pumped to the Wells 3&6 treatment facility, where it is blended with raw from Well #3. Treated water from this well enters a contact main prior to entering the distribution system. This well has not been used in several years and is in reserve status.

Fernwood Well #9 is a 12 inch diameter well drilled to the depth of 160 ft with a permitted capacity of 500 GPM. Raw water from this well is treated for Iron and Manganese. Treated water from this well enters a contact main prior to entering the distribution system.

All Seasons Well #1 is a 6-inch diameter well drilled to a depth of 400 ft and is permitted at 27 GPM. Raw water is treated for Iron and Manganese and treated water enters a contact main prior to entering the distribution system.

TREATMENT

Blue Mountain Lakes Well Building No. 1 – Blended polyphosphate and chlorine are utilized for sequestering/disinfection purposes prior to entering the chlorine contact main. Chlorine analyzers are installed for Ground Water Rule Compliance monitoring before treated water enters the distribution system.

Blue Mountain Lakes Well Building No. 2 – Blended polyphosphate and chlorine are utilized for sequestering / disinfection purposes prior to entering the chlorine contact main. Chlorine analyzers are installed for Ground Water Rule Compliance monitoring before treated water enters the distribution system.

Blue Mountain Lakes Well Building No. 3 – Chlorine is utilized for disinfection purposes prior to entering the chlorine contact main. Chlorine analyzers are installed for Ground Water Rule Compliance monitoring before treated water enters the distribution system.

Birch Acres Well Treatment Building – Currently the Birch Acres treatment building is inactive because Birch Acres receives finished water from the Mid-Monroe systems. If the well and treatment are needed, raw water would be treated with chlorine for disinfection purposes prior to entering the hydro-pneumatic tank. Chlorine analyzers are installed for Ground Water Rule Compliance monitoring before treated water enters the distribution system. The hydro-pneumatic tank maintains system pressure and discharges directly into the distribution system and is manually recharged with a small reciprocating air compressor.

Mid Monroe (Country Club of the Poconos) Well Building No. 1&2 – Pre-filter chlorine is utilized for Iron and Manganese oxidation prior to the water entering the dual pressure filters that then removes the oxidized Iron and Manganese. Post filter polyphosphate injection for corrosion control, and chlorine injection for disinfection is performed prior to the water entering the distribution system. Chlorine analyzers are utilized for Ground Water Rule Compliance monitoring before treated water enters the distribution system.

Mid Monroe (Country Club of the Poconos) Well Building No. 3 & 5 – Blended polyphosphate and chlorine are utilized for sequestering/disinfection purposes prior to entering the water storage tank. Chlorine analyzers are installed for Ground Water Rule Compliance monitoring before treated water enters the distribution system.

Saw Creek Estates Well Building No. 1 – Treated water piped from Wells No. 2 and 3 is blended with Well No. 1 raw water prior to entering Well Building No. 1. Sodium hydroxide and chlorine are utilized for pH adjustment / disinfection purposes prior to entering the chlorine contact main. Chlorine analyzers are installed for Ground Water Rule Compliance monitoring before treated water enters the distribution system.

Saw Creek Estates Well Building No. 2 & 3 – Raw water from Wells No. 2 and 3 is blended at this building before chemical addition. Blended polyphosphate is utilized for sequestering purposes prior to entering the water transmission main to the Well Building No. 1.

Saw Creek Estates Well Building No. 4 – Blended polyphosphate, sodium hydroxide and chlorine are utilized for pH adjustment and disinfection purposes prior to entering the transmission main then to the water storage tank. Chlorine analyzers are installed for Ground Water Rule Compliance monitoring before treated water enters the distribution system.

Saw Creek Estates Well Building No. 6 & 7 – Pre-filter chlorine is utilized for Iron and Manganese oxidation prior to the water entering the pressure filters that then removes the oxidized Iron and Manganese. Post filter polyphosphate injection for corrosion control, and chlorine injection for disinfection is performed prior to the water entering the chlorine contact main and then to the distribution system. Chlorine analyzers are utilized for Ground Water Rule Compliance monitoring before treated water enters the distribution system

Saw Creek Estates Well Building No. 9 & 10A – Blended polyphosphate, sodium hydroxide and chlorine are utilized for sequestering / pH adjustment / disinfection purposes prior to entering the chlorine contact main. Chlorine analyzers are installed for Ground Water Rule Compliance monitoring before treated water enters the distribution system.

Saw Creek Estates Well Building No. 12 – Well No. 12 is currently in reserve status therefore this building is also not being used.

Pine Ridge Development Well Building No. 2 – Sodium hydroxide and chlorine are utilized for pH adjustment / disinfection purposes prior to entering the chlorine contact main then into the distribution system. Chlorine analyzers are installed for Ground Water Rule Compliance monitoring before treated water enters the distribution system.

Pine Ridge Development Well Building No. 3 – Sodium hydroxide and chlorine are utilized for pH adjustment / disinfection purposes prior to entering the chlorine contact main then into the distribution system. Chlorine analyzers are installed for Ground Water Rule Compliance monitoring before treated water enters the distribution system.

Pine Ridge Development Well Building No. 4 – Blended polyphosphate, sodium hydroxide and chlorine are utilized for sequestering / pH adjustment / disinfection purposes prior to entering the chlorine contact main. Chlorine analyzers are installed for Ground Water Rule Compliance monitoring before treated water enters the distribution system.

Pine Ridge Development Well Building No. 5 – Pre-filter chlorine is utilized for Iron and Manganese oxidation prior to the water entering the pressure filters that then removes the oxidized Iron and Manganese. Post filter polyphosphate injection for corrosion control, caustic injection for pH control, and chlorine injection for disinfection is performed prior to the water entering the chlorine contact main and then to the distribution system. Chlorine analyzers are utilized for Ground Water Rule Compliance monitoring before treated water enters the distribution system

Wild Acres Lakes Well Building No. 2 – Sodium hydroxide and chlorine are utilized for pH adjustment / disinfection purposes prior to entering the chlorine contact main then into the distribution system. Chlorine analyzers are installed for Ground Water Rule Compliance monitoring before treated water enters the distribution system.

Wild Acres Lakes Well Building No. 3 & 4 – Sodium hydroxide and chlorine are utilized for pH adjustment / disinfection purposes prior to entering the water storage tank and then into the distribution system. Chlorine analyzers are installed for Ground Water Rule Compliance monitoring before treated water enters the distribution system.

Wild Acres Lakes Well Building No. 5 – Chlorine is utilized for disinfection purposes prior to entering the chlorine contact chamber then into the water storage tank. Chlorine analyzers are installed for Ground Water Rule Compliance monitoring before treated water enters the distribution system.

Marcel Lakes Well Building No. 3 & 4 – Chlorine is utilized for disinfection purposes prior to entering the below grade clear well then into the distribution system. A chlorine analyzer is installed for Ground Water Rule Compliance monitoring before treated water enters the distribution system.

Milford Landing Well Building No. 3 & 5 – Sodium hydroxide and chlorine are utilized for pH adjustment / disinfection purposes prior to entering the water storage tank and then into the distribution system. Chlorine analyzers are installed for Ground Water Rule Compliance monitoring before treated water enters the distribution system.

All Seasons Well Building No. 1 – Pre-filter chlorine is utilized for Iron and Manganese oxidation prior to the water entering the pressure filters that then removes the oxidized Iron and Manganese. Post filter polyphosphate injection for corrosion control is performed prior to the water entering the contact main and then to the distribution system. Chlorine analyzers are utilized for Ground Water Rule Compliance monitoring before treated water enters the distribution system.

DISTRIBUTION

Blue Mountain Lakes – Treated water from Wells No. 1, 2 &3 is pumped directly into the distribution system and controlled by the water level in the Blue Mountain Lakes water storage tank. Distribution piping in the Blue Mountain Development is a combination of plastic and ductile iron. Customer service lines have a meter pit installed at the property line. There are fire hydrants on this system.

Birch Acres – This system is currently supplied finished water via a 12-inch water main from the Mid Monroe system. If Well 2 would be activated, treated water from Well No. 2 would enter the distribution system through a hydro-pneumatic tank. The hydro-pneumatic tank maintains system pressure and discharges directly into the distribution system and is manually recharged as needed with a small reciprocating air compressor. The distribution system is a combination of 8 inch ductile iron water main 4 inch galvanized steel water main. Customer service lines have a meter pit installed at the property line.

Mid-Monroe (Country Club of the Poconos CCP) - The service area is divided into four (4) pressure zones. The pressure in the Main zone is established by the water level in the two water storage tanks. A pumped High zone is serviced by a booster station located inside the Wells 3 & 5 treatment building. The booster consists of one (1) 30 GPM pump, two (2) 160 GPM pumps and one (1) 750 GPM pump. The remaining two (2) pressure zones are controlled by pressure reducing valve (PRV) stations located in underground concrete vaults.

The distribution system consists primarily of plastic (PVC or PE) with some ductile iron pipe around the PRV stations. Several new sections of the development consist of 12-inch and 8-inch ductile iron pipe cement lined pipe. There are fire hydrants on this system. The distribution system also consists of a long 12-inch ductile iron water main along SR 209 that interconnects with the Birch Areas development.

Mountain Top Estates – Distribution piping in Mountain Top Estates consists of 13,000 ft. of 2-inch and 4-inch plastic pipe and is interconnected with Saw Creek Estates. The distribution system is not designed to provide fire protection.

Saw Creek Estates Tank No. 1 Zone – Treated water from Wells No. 6, 7, 9 and 10A is pumped into Tank No. 1 zone. The wells are controlled by tank level and SCADA controls.

There is a Tank No. 1 Booster Station that is used to supplement Tank No. 6 when needed. There is also the Woodbridge Booster Station No. 2A that pulls water from Tank No. 1. This booster station is used to feed water to Tank No. 3 and Tank No. 2. This water also supplies the Tank No. 1 distribution areas accordingly.

Saw Creek Estates Tank No. 2 Zone – Tank No. 2 is supplied with treated water from Tank No. 1 via the Woodbridge Booster Station No. 2A is sent into the distribution piping for this zone, along with being used to supplement the Tank No. 7 zone. Distribution water is pulled from the Tank No. 2 zone into the Tank No. 7 zone via the Lancaster Booster Station. This water supplies the Tank No. 2 and Tank No. 7 distribution areas accordingly.

Saw Creek Estates Tank No. 3 Zone - Treated water that is supplied from Tank No. 1 via the Woodbridge Booster Station No. 2A is sent into the distribution piping for this zone and into the Tank No. 3. There is a Tank No. 3 Booster Station that is located at the tank which helps boost pressure in this area to customers around the tank accordingly, along with the remainder of the Tank No. 3 distribution zone.

Saw Creek Estates Tank No. 4 Zone - Treated water from Well No. 4 is connected directly to Tank No. 4 with a 4-inch plastic transmission main for a distance of 4,100 ft. Water passes thru pressure reducing valves in the distribution system to help supply the Tank No.3 Zone. Well operation is controlled by the tank water level and SCADA controls. This water also supplies the Tank No. 4 and Tank No. 3 distribution areas accordingly.

Saw Creek Estates Tank No. 5 & 6 Zone - Treated water from the Wells No. 1, 2, and 3 pumps into the distribution system and fills Tank No. 5. The treated water from Wells No. 1, 2 and 3 is also used to fill Tank No. 6 via the Porter Dr. booster station. The wells are controlled by tank level and SCADA controls. This water also supplies the Tank No. 5 and Tank 6 distribution areas accordingly.

Saw Creek Estates Tank No. 7 Zone – Treated water that is supplied from Tank No. 1 via the Woodbridge Booster Station No. 2A is sent into the distribution piping for the Tank No. 2 zone and distribution water is pulled from the Tank No. 2 zone into the Tank No. 7 zone via the Lancaster Booster Station.

The majority of the distribution system piping consists of plastic water mains. All the customers in Saw Creek Estates are metered by meters in the homes. Fire hydrants are located in select locations throughout the system.

Pine Ridge Well No. 2, 3, 4, & 5 pumps treated water into the distribution system and them into the Pine Ridge Tank. Well No. 2, 3, 4, & 5 are controlled via tank level and SCADA controls. The distribution system consists of a combination of ductile iron and PVC water mains. All customers are metered, with water meters being located in the homes for the most part. There are no fire hydrants located in this system.

Wild Acres Lakes – Well No. 2 pumps into a chlorine contact main before entering the main gradient portion of the distribution system then into Tank No. 2. Wells No. 3 & 4 water is treated then enters Tank No. 2 before entering the main gradient of the distribution system also.

Well No. 2, 3 & 4 all feed the lower gradient of the distribution system thru a pressure reducing valve station. Well No. 5 enters the chlorine contact chamber then into Tank No. 5 before entering the high gradient of the distribution system. Customer service lines have a meter pit installed at the property line. The distribution system consists of a combination of PVC, polyethylene, and cast-iron water mains. Fire hydrants area only located in the low gradient section of the system.

Marcel Lakes - Well Building No. 3 & 4 treated water enters the distribution system and fills the Marcel Lakes water storage tank. At the tank site is a booster pump system that helps boost the pressure for 15 homes that surround the storage tank site. Customer service lines have a meter pit installed at the property line. The distribution system consists mostly of smaller diameter plastic water mains. There is only one (1) fire hydrant located within the system.

Milford Landing (Three Lanes) - Well No. 3 & 5A treated water enters the water storage tank and then into the distribution system via a booster pumping system that is located inside the treatment building. The booster station also contains a fire pump system The distribution system stays pressurized by the combined operation of the booster and fire pumps. The distribution system consists primarily of ductile iron water mains and there are fire hydrants located within the system.

The Fernwood distribution system consists of various sized (2" through 10") plastic water mains. The systems Main gradient operates off the water level in the two (2) storage tanks. A lower pressure zone is controlled by a pressure reducing valve station. Fire hydrants are located within the system.

The All Seasons distribution system consists of 1 and 2 inch polyethylene mains and the system operates on a single pressure gradient controlled by hydro-pneumatic tanks at the treatment building. There are no fire hydrants in this system.

DISTRIBUTION STORAGE

Blue Mountain Lakes Tank No. 1 is a 65 ft high bolted steel tank with a diameter of 32 ft. with a nominal capacity of 403,000 gallons. This tank has an overflow elevation of 1047 ft which establishes the main system gradient. There is also a high pressure zone that is at the tank site via a booster station.

Birch Acres Development does not have a water storage tank at this time. This system is interconnected with the Mid Monroe system.

Mid Monroe (Country Club of the Poconos CCP) Storage Tank No. 1 is a bolted steel tank 39 feet in diameter and 35 feet high, with a nominal capacity of 300,000 gallons. The tank is located off Ridge View Circle and has an overflow elevation of 914.0.

Mid Monroe (Country Club of the Poconos CCP) Storage Tank No. 3 is a welded steel tank. The 250,000 gallon storage tank is 46 feet in diameter and 20 feet high. The tank is located at the treatment building at Doral Ct. and has an overflow elevation of 914.0.

Storage in Saw Creek Estates is in the various pressure zones furnished by the following seven (7) water storage tanks:

Tank No. 1 is a 47 ft. high, 28 ft. diameter glass lined bolted steel tank with a nominal capacity of 210,000 gallons. This tank with an overflow elevation of 843 ft. establishes the hydraulic gradient for its service territory.

Tank No. 2 is a 33 ft. high, 34 ft. diameter glass lined bolted steel tank with a nominal capacity of 211,900 gallons. This tank with an overflow elevation of 1,049 ft. establishes the hydraulic gradient for its service territory.

Tank No. 3 is a 32 ft. high, 33 ft. diameter bolted steel tank with a nominal capacity of 200,000 gallons. This tank with an overflow elevation of 1,140 ft. establishes the hydraulic gradient for its service territory.

Tank No. 4 is a 72 ft. high, 24 ft. diameter bolted steel with a nominal capacity of 240,000 gallons. This tank with an overflow elevation of 1,181.5 ft. establishes the hydraulic gradient for its service territory.

Tank No. 5 is a 64.5 ft. high, 24 ft. diameter bolted steel with a nominal capacity of 225,000 gallons. This tank with an overflow elevation of 1,173.5 ft. establishes the hydraulic gradient for its service territory.

Tank No. 6 is a 66 ft. high, 25 ft. diameter bolted steel tank with a nominal capacity of 242,000 gallons. This tank with an overflow elevation of 1236.3 ft. establishes the hydraulic gradient for its service territory.

Tank No. 7 is a 102 ft. high, 20 ft. diameter, bolted steel tank with a nominal capacity of 226,000 gallons. This tank with an overflow elevation of 1,184 ft. establishes the hydraulic gradient for its service territory.

The Pine Ridge tank is a 75’8” high elevated storage tank with a bowl diameter of 47’ 9” with a nominal capacity of 325,000 gallons. This tank has an overflow elevation of 1391.17 ft which establishes the main system gradient.

Wild Acres Lakes Tank No. 2 is a 45 foot high, 22 ft. diameter glass lined bolted steel tank with a nominal capacity of 100,000 gallons. This tank establishes the hydraulic gradient for its service territory.

Wild Acres Lakes Tank No. 5 is a 24 ft. 9-inch high, 30 ft. diameter welded steel elevated storage tank with a nominal capacity of 100,000 gallons. This tank establishes the hydraulic gradient for its service territory.

The Marcel Lakes tank is a 58 ft. high, 20 ft. diameter glass lined bolted steel tank with a nominal capacity of 135,000 gallons. This tank has an overflow elevation of 1441.0 ft which establishes the main system gradient.

The Milford Landing tank is a 33 ft. high, 31 ft. diameter bolted steel tank with a nominal capacity of 180,000 gallons. This tank establishes the hydraulic gradient for its service territory.

Fernwood Tank # 1 is a 32 ft high 130,000 gallon welded steel tank. This tank establishes the hydraulic gradient for its service territory.

Fernwood Tank #2 is a 58 ft high 500,000 gallon bolted steel tank. This tank establishes the hydraulic gradient for its service territory.

All Seasons does not currently have a tank for stored water. Two (2) 750-gallon hydro-pneumatic tanks located at the treatment building provide pressure and operating storage for this system.

MCEWENSVILLE WATER

The McEwensville Water System of Pennsylvania-American Water Company supplies potable water for domestic, fire protection, and municipal use for customers in McEwensville Borough and as well as a portion of Delaware Township, Northumberland County.

SOURCE OF SUPPLY

The McEwensville Water System is a ground water system with two wells. Both wells are classified as groundwater sources of supply; Well No. 1 has a permitted capacity of 110,800 gpd and Well No. 2 has a permitted capacity of 115,200 gpd.

WATER TREATMENT

There are two existing treatment buildings, one associated with each well. A treatment building was constructed over Well No. 1 to house metering and disinfection equipment. The well utilizes a sodium hypochlorite system to maintain a chlorine in the distribution system

A treatment building was constructed adjacent to Well No. 2 to house metering and disinfection facilities. The disinfection system utilizes a sodium hypochlorite system to maintain a chlorine residual in the distribution system.

DISTRIBUTION

The distribution system is fed by gravity from the 0.100 MG tank and consists of approximately 2 miles of main. The distribution system ranges in size from 4 to 6-inch diameter mains and the system operates on a single pressure gradient. There are 9 fire hydrants connected to the distribution system.

MILTON DISTRICT

Milton Service Area:

Pennsylvania-American Water (Milton Area) serves an area located along the West Branch of the Susquehanna River in Union and Northumberland Counties. The territory is about 2.5 miles wide and 17.8 miles long, extending from Packer Island between Sunbury and Northumberland on the south to Dewart on the north. The municipalities served are the boroughs of Lewisburg, Milton, Northumberland, and Watsontown; and all, or portions of East and West Chillisquaque, Kelly, Buffalo, East Buffalo, Turbot, White Deer, Point, Delaware, Upper Augusta and Gregg Townships. The estimated population served is 30,308.

Sources of Supply:

The Milton District has three (3) independent sources of supply: White Deer Creek, Spruce Run, and the West Branch of the Susquehanna River. All of these sources of supply are located in the Susquehanna River Basin.

White Deer Creek has a watershed of approximately 37.1 square miles. The intake facilities are located about 6 miles west of Watsontown, PA. Water flows by gravity from a diversion dam into an intake chamber, through a traveling screen, and then through 16-inch and 24-inch parallel pipelines to the White Deer Creek Filter Plant (WDCFP) pump house. The water allocation permit (Order of Confirmation) is for 3.0 MGD.

Spruce Run has a watershed of approximately 13.6 square miles. The intake facilities are located about 7 miles west of Milton, PA. Water flows from a diversion dam on Spruce Run into a 420.0 MG earth embankment side-hill reservoir immediately adjacent to the creek. Raw water from the reservoir is pumped through 16-inch and 24-inch pipelines to the WDCFP. A condition of the Dam Permit requires that a flow of at least 1.315 MGD be maintained in Spruce Run in order for PAW to divert water from the creek into Spruce Run Reservoir. PAW is currently operating under an existing Order of Confirmation that allows PAW to withdraw 2.0 MGD from Spruce Run (the stream) while maintaining the required pass-by flow.

The West Branch of the Susquehanna River (WBSR) has a watershed of approximately 6,681 square miles. Water flows by gravity from an intake structure located in the river through a 42-inch pipe and then through a traveling screen to the raw water suction well. The water allocation permit is for 6.0 MGD.

There are no known surface water intakes located immediately downstream from either the White Deer Creek Filter Plant or the Milton Filter Plant.

Treatment:

Two water treatment plants serve the Milton District Service Area. The White Deer Creek Filter Plant (WDCFP) is located on White Deer Pike, 5.5 miles west of Watsontown, PA and treats raw water drawn from both White Deer Creek and Spruce Run Reservoir. The WDCFP is permitted at 6.0 MGD capacity. The Milton Filter Plant (MFP) is located at 702 South Front Street and treats raw water from the West Branch of the Susquehanna River (WBSR). The MFP is permitted at 6.2 MGD capacity. Combined, these two filter plants are permitted to produce up to 12.2 MGD.

At the WDCFP, raw water from White Deer Creek and/or Spruce Run Reservoir is pumped from the pump houses to the WDCFP. Pre-treatment facilities provide for mixing, flocculation, and sedimentation.

The raw water flows through an in-line mixer where pretreatment chemicals are added. The treated water is discharged into the center of two (2), three-section tanks. The center ring contains the flocculating chamber and lightning mixing equipment. The flocculated water flows under a curtain wall into a second compartment where sedimentation takes place and then over v-notched weirs into the third compartment or ring where the filters are located. Provision is made for the application of a polymer filter aid at this point. Water from the dual media filters is discharged to a filtered water header and then to a 20-inch pipe where post chemical treatment takes place. Water is then delivered to a 317,000 gallon capacity intermediate storage tank. Water from the intermediate tank is pumped to a 500,000 gallon capacity baffled contact clearwell which provides gravity flow to the distribution system.

At the MFP, raw water is conveyed approximately 420 feet from the intake to the raw water suction well. Pre-treatment facilities provide for mixing, flocculation, and sedimentation. Powdered Activated Carbon is added in the suction well for taste and odor control.

Three (3) 3.0 MGD pumps deliver water from the raw water suction well through an in-line mixer where pretreatment chemicals are added. The treated water is discharged to the center of two (2), two-section tanks. The center ring contains the flocculating chamber with lightning mixing equipment. The flocculated water flows under a curtain wall into the second compartment where sedimentation takes place and then over v-notched weirs into collecting launders located at the periphery of the settling compartments. The settled water flows from the clarifier through a 30-inch pipeline where intermediate treatment chemicals chlorine (sodium hypochlorite) and filter aid (when needed), may be applied. The water flows into three (3) conventional filters containing a dual media bed. The filtered water drains into a 24-inch pipeline where post treatment chemicals are applied. The finished water then flows into a two-chambered clearwell that has a capacity of 400,000 gallons. Water is pumped from the clearwell by three (3) 3.0 MGD high service pumps through a 20-inch transmission main into the adjacent distribution system.

Distribution Storage:

The Milton District Service Area has seven (7) tanks and one (lined and covered) reservoir. Distribution system storage consists of a 1.0 MG standpipe in Milton; a 1.0 MG standpipe and a 0.235 MG standpipe in Lewisburg; a 1.0 MG standpipe in Northumberland; a 0.750 MG pre-cast concrete tank in Point Township; a 1.0 MG hydropillic tank north of Allenwood; a 0.500 MG elevated tank in East Buffalo Township; and a 0.850 MG gallon (lined and covered) reservoir in Watsontown. The water levels in the storage facilities are monitored by a SCADA (Supervisory Control and Data Acquisition) system at the Milton Filter Plant. These distribution storage tanks provide water for high demand usage and fire protection.

Distribution System:

The distribution system is divided into four (4) principal service areas. The Lewisburg Area is supplied from the West Milton and South Front Street distributive pumping facilities. The Milton Area is supplied from the West Milton pumping facility and the Milton Filter Plant (MFP). The Northumberland Area is served from the Montandon distributive pumping facility. The Watsontown/Allenwood Area is supplied from the White Deer Creek Filter Plant (WDCFP) and the White Deer Village pumping facility. There are several smaller booster systems within these principal areas. Per our Annual Water Supply Report for 2018, the Milton District serves 13,544 connections.

The White Deer Village distributive pumping facility is located in the village of White Deer near the termination of the 16-inch transmission main from the WDCFP. Three (3) 0.720 MGD pumping units deliver water to the Allenwood Area and the Allenwood Federal Bureau of Prisons complex through 4 miles of 16-inch pipe. Operation of this facility is telemeter controlled by the water level in the Gregg Township elevated tank. Pressures and flow are monitored at the WDCFP.

The West Milton distributive pumping facility is located on River Road in West Milton. This facility has one pump, which pumps water through a 12-inch pipeline to Lewisburg on the west side of the Susquehanna River. In addition, water from the 16-inch gravity transmission main from the WDCFP passes through the West Milton facility to the river crossing to Milton. The flow to Lewisburg is transmitted to the control center. There is a spare pump located at the facility.

The South Front Street distributive pumping facility is located on South Front Street in Milton near the front entrance to the MFP. Three (3) 2.8 MGD pumping units boost water from the Milton system through approximately 3 miles of 16-inch pipeline into the Lewisburg Area. Operation of these pumping units is controlled remotely by an operator at the MFP.

The Montandon distributive pumping facility is located approximately 2,000 feet southeast of Montandon. Three (3) 0.72 MGD pumping units deliver water to West

Chillisquaque and Point Townships and Northumberland Borough. Pressures and flow are monitored and controlled at the MFP.

The College Park Booster Station is located adjacent to the Lewisburg Standpipes. Three (3) 0.650 MGD pumping units boost water into a high elevation area west of the Lewisburg Standpipes and to the West Lewisburg Tank located in East Buffalo Township. The operation of this booster station is monitored at the MFP and controlled by the water level of the West Lewisburg Tank.

The New Columbia Booster Station is located at 4th Street and Cherry Alley in New Columbia. This pumping station serves an area west of New Columbia. Equipment consists of four (4) pumps with a combined delivery of 1.080 MGD. This facility is equipped with an emergency generator for use in case of power failure.

The Mahoning Street Booster Station is located on Mahoning Street in Milton across from the Milton Area High School and serves a growing area in East Chillisquaque and Turbot Townships. Three (3) 0.200 MGD pumping units and one 1.000 MGD pumping unit boost water to this area. Operation of this pumping station is controlled by system pressure.

The Turbot Avenue Booster Station is located on Turbot Avenue just north of the intersection of Turbot and Park Avenues. This pumping station serves a high elevation area in the northeast section of Milton Borough. Equipment consists of two (2) Grundfos vertical centrifugal pumps, each rated at 150 GPM at 140 feet of head, and one 1,000 GPM flow pump. The system is automatically controlled by system pressure.

The Prince Street Booster Station is located at 7th and Prince Streets in Northumberland and serves an area northeast of the Northumberland Standpipe. Three (3) 0.576 MGD pumping units provide domestic, industrial, and fire protection to customers in the Northumberland and Point Township high elevation area. This station also feeds the Point Township Tank. The system is controlled by the water level of the Point Township Tank. Pressure, flow, and tank water level are transmitted to the MFP for monitoring.

The Watsontown Reservoir Booster Station is located at 3rd Street and Baylor Road and consists of two (2) 320 GPM pumping units. The pumps take suction directly from the storage reservoir and discharge to two separate pressure gradients (Watsontown Hill section and the Dewart area) in the distribution system.

The Peachwood Booster Station is located west of J.P.M. Road on Lamplight Lane in Kelly Township. This pumping station serves a developing residential area in Kelly Township northwest of Lewisburg. Two (2) 0.216 MGD pumping units boost water to an isolated higher elevation.

Wastewater Facilities:

Backwash water from the WDCFP flows into a wastewater clarifier unit. Water

from this holding tank is pumped back to the head of the plant. Sludge from this unit is discharged into two drying basins. Dried sludge is removed to be land applied or taken to a registered landfill.

Backwash water from the MFP flows into one of two sludge tanks. Sludge is removed to be land applied or taken to a registered landfill.

All material removed from the raw water at both the WDCFP and the MFP is disposed of in an environmentally sound manner.

Operation/Distribution Center:

The 11,520 square foot Milton Operations/Distribution Center, which is located in the Milton Industrial Park at the corner of Sodom and Industrial Park Road, provides a centralized reporting location for business, administrative, and distribution functions of the Milton District.

MON-VALLEY DISTRICT

Mon-Valley District serves a population of approximately 50,000 throughout the cities of Clairton and Monongahela; the Boroughs of Dravosburg, Elizabeth, Glassport, Jefferson, Liberty, Lincoln, New Eagle, and West Elizabeth; most or all of the Townships of Carroll, Elizabeth, Forward, and Union; and small portions of Fallowfield Township and Nottingham Township.

SOURCE OF SUPPLY

Mon-Valley District maintains six pipeline connections with the Pittsburgh District as their main source of supply. In addition to these, there are several smaller metered connections to the Municipal Authority of Westmoreland County (MAWC). One MAWC connection serves a small portion of the Mon-Valley system exclusively while the others augment flows from the Pittsburgh District.

DISTRIBUTION STORAGE

Storage in the Mon-Valley District is provided by nine tanks. The 1.10 MG concrete reinforced Bellebridge Tank, the 0.30 MG welded steel elevated Fourth Street Tank, the 1.25 MG elevated Elizabeth Township Tank, the 0.50 MG elevated Eldora Tank, the 0.50 MG elevated Eldora II Tank, the 0.30 MG elevated Ridge Road Tank, the 0.5 MG Liberty Borough Tank, the 0.275 MG Lincoln Borough Standpipe, the 1.0 MG welded steel Monongahela Main Service Reservoir, the 0.30 MG elevated Route 885 Tank, and the 0.15 MG elevated Glassport Tank.

DISTRIBUTION

The Mon-Valley district operates as two separate systems. Water for the Valley system is primarily provided from the Shire Oaks gradient in the Pittsburgh district. The Clairton Basin provides storage for the main part of the Valley system while the Belle Bridge and Mill Hill boosters deliver water to the high elevations. There is also a series of PRV stations that regulate pressures to some of the lower elevations and regulate flows to some of the storage tanks. Water for the Monongahela system is primarily provided through the Rt. 136 PRV connection to the Pittsburgh District to the Monongahela Main Service Reservoir. The Fisher Heights and Ridge Road boosters deliver water to the higher elevations in the system.

MOSHANNON VALLEY

The Moshannon Valley area serves the Boroughs of Philipsburg, Wallaceton, Chester Hill, and Osceola Mills; and portions of Rush, Morris, Decatur, Graham, Bradford, and Boggs Townships. The estimated population served is 22,218.

SOURCE OF SUPPLY

Water supply is taken from an 8.7 million gallon impoundment on Cold Stream Run, four miles south of Philipsburg. Additional sources of supply are the Blue Spring, which is equipped with a 15 hp submersible electric pump, and three wells. Water from the Philipsburg Reservoir, Spring, and Wells No. 1 and 2 is pumped from the Cold Stream Raw Water Pumping Station by means of three 900 GPM pumps to the Treatment Plant. Well No. 3 is pumped directly to the Treatment Plant from the well. A second water supply is located in the Trout Run Watershed area south of Osceola Mills. Trout Run Well No. 1 and Trout Run Well No. 2 pump water directly into the distribution system.

TREATMENT

The Cold Stream Watershed sources are fully treated and filtered through the Philipsburg Treatment plant, which has a 2.3 MGD capacity. Cold Stream and Blue Spring have a combined water allocation of 1.4 million gallon per day. The 3 wells have a combined allocation of 1.03 MGD. The Trout Run Well No. 1 allocation is .533 MGD and Well No. 2 is .979 MGD and both are pumped directly into the distribution system after chemical treatment at the Penn 5 treatment building.

DISTRIBUTION STORAGE

Thirteen distribution storage tanks serve the area. The 1 million gallon tank located near the Philipsburg Treatment Plant is the first storage area after the plant process; water flows from the plant to the Philipsburg and/or Osceola Mills pressure gradients. The 420,000-gallon Curtis Park Standpipe serves the southeast portion of the system. The Windy Hill Standpipe, with a capacity of 310,000 gallons, supplies the area where several of the largest users are located. The Manor Hill Standpipe stores 108,000 gallons of water for use in the Osceola Mills area. The Shady Acres Tank has a storage capacity of 285,000 gallons and serves the area near the West Branch School, and the village of Allport. The 200,000-gallon Bigler Tank helps to supply the area in and near Bigler. The Pine Top Tank, also stores 200,000 gallons, and serves the Woodland area. The Pleasant Valley Tank operates on the same gradient as the Bigler Tank and has a storage capacity of 500,000 gallons. A 150,000-gallon tank serves the former Morris Authority system, acquired in 1996. The Spring Valley tank holds 110,000 gallons and serves the Spring Valley and Morgan Run areas. A 100,000 gallon tank at Sandy Ridge serves the village of Sandy Ridge and the West Decatur area is served by a 100,000 gallon tank just outside of West Decatur. The Eagle Eye Tank stores 100,000 gallons and serves the Drane area. A 136.000 gallon tank serves the Borough of Wallaceton.

DISTRIBUTION

Treated water flows from the Philipsburg Treatment Plant by gravity from to a 1.0 MG steel storage tank located at the treatment plant site. Water from the Penn 5 Treatment facility flow into the same pressure gradient from the tank, water continues into the distribution system where approximately 60 percent of delivery is provided without additional pumping. Fifteen (15) booster pumping stations raise pressures to serve various isolated high elevation areas, with one station, the Emigh Run Pumping Station, serves the entire northern portion of the system. Twenty-four PRV's regulate pressure throughout the system to keep operating pressures within standards. These pumps and PRVs create 32 different pressure zones.

NAZARETH / BLUE MOUNTAIN

The Blue Mountain District currently serves customers located primarily in Northampton County in the Boroughs of Nazareth, Wind Gap, Pen Argyl, Stockertown, Tatamy, Belfast, and portions of the adjacent townships of Ross, Bushkill, Plainfield, Forks, Upper and Lower Nazareth, and parts of Palmer. The certificated service area is located in the heart of the Lehigh Valley, parallel to Route 33 just north of the cities of Allentown, Bethlehem, and Easton, Pennsylvania.

SOURCE OF SUPPLY

The Blue Mountain District's existing facilities serve approximately 18 square miles of a total certified area of 83 square miles. The district's main source of supply is the Stoney Garden reservoir which directly supplies the Stoney Garden treatment plant both located in Monroe County. The Ross Common Creek flows directly into the Stoney Garden reservoir. The Cherry Valley pump station located along the Cherry creek pumps creek water supplied by three (3) covered springs through a 12-inch pipe into the Stoney Garden reservoir. The supply from six (6) wells located along the Ross Common Creek downstream of the Stoney Garden Reservoir pump into a common pipeline back into the Stoney Garden reservoir. The district also has a surface supply at Pen Argyl the Douglasville well (currently in reserve status) in and the Dietz well all located in Northampton County. Lastly, the district has two interconnections with Easton Suburban Water Authority, one located at the southern end of Nazareth Borough and the other located at the southern end of the Wolf's Run Development in Palmer Township..

The Stony Garden reservoir is a 12 MG reservoir having an earth and rockfill embankment dam with a concrete spillway. From this location water flows through a 14-inch transmission main to the Stony Garden Treatment Plant.

At Ross Common there are five drilled wells numbers 1A, 2, 3, 4, and 5. Wells 1A, 2, 3, and 5 are connected to a single 10-inch trunk line increasing to 12-inch, which runs in an easterly direction through a 24 inch casing beneath Route 33 and connects with the 10-inch influent main to the Stony Garden reservoir. Ross Common well no. 4 is used to augment the Ross Common stream flow. Ross Common Well No. 6, which is located on the easterly side of Route 33, pumps directly into the 10 inch influent main to the Stony Garden Reservoir.

TREATMENT

The Stony Garden filtration plant is designed to treat the raw water supply from the Ross Common stream, Cherry Valley springs, and Ross Common wells. The plant consists of one main treatment building, a backwash wastewater tank, a high service pump station, a sludge drying bed, two (2) clearwell storage tanks and two (2) 0.5 MG steel finished water storage tanks. The main treatment building houses three (3) filter units, each unit capable of treating 1.6 MGD. All required monitoring equipment, controls, and chemicals are also included at the plant.

The Penn Argyl filtration plant is designed to filter the stream supply. The stream is piped to a 1.3 MG raw water impoundment reservoir. The water flows from the reservoir through a 12-inch main and reduces to a 6-inch main before the filtration plant. The filtering system consists of two (2) 150 GPM filter units. The filters are the diatomaceous earth vacuum-type with a combined capacity of 300 GPM. The Penn Argyl filtration plant is currently not used and is in standby service.

The water supply is chlorinated at the Stony Garden Filtration Plant, the Penn Argyl Filtration Plant, and the Dietz Well at Wind Gap.

DISTRIBUTION STORAGE

Distribution storage consists of two (2) 0.5 MG storage tanks located at the Stony Garden Treatment Plant, one (1) 0.5 MG storage tank located at the Penn Argyl Water Treatment Plant, one (1) 0.304 MG Nazareth Reservoir tank, one (1) 1.3MG Nazareth Reservoir, and one (1) 0.3 MG elevated tank in Palmer Township.

DISTRIBUTION

Finished water from the two (2) 0.5 MG Stoney Garden distribution storage tanks flows by gravity through a 20-inch main to several borough distribution systems south and east of the plant. North of Wind Gap, 8-inch and 10-inch transmission mains extend from the 20-inch supply main eastwardly to Penn Argyl. The Constitution Avenue booster station increases the available water supply in the 10-inch main leading to the center of Penn Argyl and is directed to a 0.5 MG steel water storage tank and booster pump station located at the site of the Penn Argyl filter plant. The booster station consists of two pumps each rated at 30 GPM and one diesel-powered fire pump rated at 550 GPM and provides service to the upper elevations of Penn Argyl. The 8-inch transmission main to Penn Argyl extends from Route 115 to the south side of Penn Argyl.

The Nazareth Reservoir has a capacity of 1.3MG. The reservoir receives water from 8-inch, 6-inch, and 16-inch southerly transmission lines from the Wind Gap area. The 8-inch and 6-inch by way of Bushkill Center and Douglasville and the 16-inch by way of Belfast and Stockertown, the 16-inch also providing the water supply to Stockertown, Tatamy, Upper Nazareth Township and Palmer Township.

The distribution system pressures of the Blue Mountain District are directly influenced by the two 0.5 MG storage tanks located at the Stony Garden Treatment Plant. The 0.5 MG storage tank located at the Penn Argyl Water Treatment Plant balances pressures and flows from the Stony Garden storage tanks in the northeastern portion of the distribution system. Water flows by gravity from the Stony Garden storage tanks to the 0.304 MG Nazareth Reservoir tank and 1.3MG Nazareth Reservoir and the 0.3 MG

elevated tank in Palmer Township in the southern portion of the distribution system. Pressures and flows to the southern portion of the system are regulated pressure reducing valve stations. One (1) booster pump station increases the pressure to existing customers at higher elevations in Nazareth.

NESBITT/HUNTSVILLE

The Nesbitt/Hillside areas serve all or portions of Edwardsville, Forty Fort, Kingston, Luzerne, Swoyersville, West Wyoming, and Wyoming Boroughs, and in Kingston Township. In addition, the Nesbitt area services customers in all or portions of Avoca, Duryea, Exeter, Hughestown, Moosic, Old Forge, and West Pittston Boroughs, Pittston City, Jenkins, and Pittston Township in Luzerne and/or Lackawanna County.

SOURCES OF SUPPLY

Spring Brook, a major tributary of the Lackawanna River, is the source of water for the Nesbitt water supply system. Four impoundments located in the Spring Brook watershed serve as water supply reservoirs. These include Watres, Maple Lake, Nesbitt, and Springbrook Intake Reservoirs.

Watres Reservoir is the most upstream impoundment on the main branch of Spring Brook. Watres is a 1.94-billion-gallon (Bgal) reservoir with a drainage area of approximately 15 square miles. The normal water elevation in Watres Reservoir is 1,426.35 feet. Although Watres Reservoir itself is utilized as a supply reservoir for the Watres Water Purification Plant, overflow from the Watres Reservoir is available to the supplies located downstream on Spring Brook. Water from the Watres Reservoir is transmitted via a transmission main to the Gardner Creek Pumping Station where a regulating valve controls inflow to the Watres Water Purification Plant.

Maple Lake, located on a tributary of Spring Brook, is a 214-million-gallon (Mgal) reservoir with a drainage area of approximately one square mile. Maple Lake is used during low-flow periods to supplement flow into the Nesbitt Reservoir.

The Nesbitt Reservoir is a 1.28 Bgal impoundment located on Spring Brook. The Nesbitt Reservoir has a drainage area of approximately 21 square miles, not including the drainage areas of the upstream Maple Lake and Watres Reservoirs. The normal pool elevation in Nesbitt Reservoir is 1,155.75 feet. Historically, Nesbitt Reservoir was used only as a storage reservoir from which water was discharged to supplement the flow available at the downstream Springbrook Intake Reservoir. A 30-inch transmission line was constructed from Nesbitt Reservoir to the Nesbitt Water Purification Plant, located in the vicinity of Springbrook Intake Reservoir, to serve as the plants' raw water supply main.

The Springbrook Intake Reservoir is a 25.5 Mgal reservoir located on Spring Brook with a normal pool elevation of 910.73 feet. Springbrook Intake Reservoir drains a watershed area of approximately 6.2 square miles downstream of the Nesbitt Reservoir. Since the construction of the 30-inch Nesbitt transmission main, the Springbrook Intake Reservoir has been on standby status.

Nesbitt Reservoir is located over 200 feet higher than the Nesbitt Water Purification Plant. With the excess head available from the Nesbitt Reservoir, a hydro turbine is utilized at the Nesbitt Water Purification Plant to generate electrical power for plant operations. Treated

water is discharged from the water purification plant to two water storage tanks. Water is delivered to the distribution system through two parallel mains of 24 and 30-inch diameter.

The Huntsville system obtains its water from Huntsville Reservoir, a 1.92 Bgal supply reservoir with a drainage area of 8.0 square miles. Water is impounded behind a masonry arch dam, originally built in 1891. The spillway elevation is 1,133.09. Two 8-inch siphons and two gated outlets can release water from Huntsville Reservoir to maintain minimal stream flow Huntsville Creek. Raw water is drawn thru two intake screens situated off the shore of the reservoir. Three (3) pumps with rated capacities of approximately 2.8 MGD pump water from the reservoir to the treatment facility. Water flows from the 163,000 gallon in-plant clearwell thru approximately 21,000 feet of 20-inch DICL finished water transmission main to two (2) 0.924 Mgal Water storage tanks (overflow elevation of 826.0) at the site of the former Hillside Water Purification Plant. A 30-inch water transmission main delivers finished water from these storage tanks to the distribution systems.

TREATMENT

The Nesbitt plant is near Springbrook Intake Dam along Route 502, situated on the boundary line between Moosic Borough and Springbrook Township. The plant has a rated capacity of 12.0 MGD. Water supply to the plant is provided by gravity from Nesbitt Reservoir.

The raw water is delivered by gravity from the source of supply directly to the plant where initial pre-chemical additions are made. Pretreatment chemicals include alum, lime, potassium permanganate, activated carbon, and coagulant. After pre-chemicals are added, the water passes through rapid mixing units consisting of two in-line static mixers and then into flocculation units consisting of six basins with two staged horizontal reels. The next step in the treatment process consists of granular media filtration. Filters are equipped for air/water washing.

After being filtered, water flows through the plant's clear well where many of the post treatment chemicals such as chlorine for disinfection, lime or caustic soda for pH adjustment, and polyphosphate for corrosion control are added before entering the 2.0 Mgal and 1.5 Mgal storage tanks on the plant site.

The Huntsville Plant is located on the shoreline of Huntsville Reservoir along Reservoir Road in Dallas Township. The plant has a rated capacity of 4.5 MGD. Water supply to the plant is provided by raw water pumping from Huntsville Reservoir. The raw water is pumped from the source of supply directly to the plant where initial pretreatment additions are made. Potassium permanganate can be added as water exits the raw water pumping station for oxidation of soluble metals and organics. A baffled, concrete basin at the plant influent provides additional contact time for oxidation. Water entering the treatment plant is metered, chemically pretreated with polyaluminum chloride, powdered activated carbon, chlorine, caustic soda, and coagulant, and mixed with flash mixers prior to being distributed to the clarifiers.

Following chemical addition and mixing, the water flows into four clarifiers where up flow adsorption/clarification takes place. Mixed water enters each clarifier at the bottom of the basin. Flocculation occurs in the void spaces within the non-buoyant media, and the flocculated particles are then adsorbed onto the media surface. The water then flows through a filter influent flume and spills out onto four, high-rate dual media filters, where remaining solids are removed. After filtration, three (3) post treatment chemicals (chlorine, caustic soda, and a corrosion inhibitor) are added to the water in the clear well influent and effluent. The clear well provides backwash water for the filters and additional volume to maintain the system gradient for the finished water supply. Water existing the clear well flows by gravity through a 20-inch transmission main to two ground storage tanks known as Hillside Tank 1 and Tank 2 located along Hillside Rd.

DISTRIBUTION

The Nesbitt water supply serves the low areas of the Wyoming Valley which border the Lackawanna and Susquehanna Rivers from Moosic south to Forty-Fort, Kingston, and Swoyersville. Its service area ranges in elevation between approximately 550 and 860 feet. The distribution system contains the W. Wyoming booster pump station and 250,000-gallon storage tank (overflow elevation 934). The Huntsville supply provides gravity service to areas ranging in elevation between 530 and 930 feet. Three distribution-pumping stations and three distribution storage tanks serve the upper elevations of this service territory. In addition to the gravity service area, water leaving the Water Purification Plant is transmitted to the 180,000-gallon Rice St. Tank (overflow elevation of 1,143) for service to customers in Trucksville and Shavertown/Kingston via the Rice Street pump station service territories. The Nesbitt water supply system merges with the Hillside Water Purification Plant supply system on the west side of the Susquehanna River. Water supply to Nesbitt/Hillside mix area can be controlled from either source, depending on demands and the output from the 2.0 Mgal Campbell's Ledge tank and the two-(2) Hillside Tank 1 and Tank 2 ground storage tanks.

Water from the Huntsville service area also crosses the river through two 24-inch mains and serves portions of downtown Wilkes-Barre. Pressure is reduced to the downtown area through the Court House regulators.

The Huntsville service area also adjoins the Ceasetown service area in Courtdale and Edwardsville. The hydraulic grade line of the Ceasetown service area is about 100 feet higher than the Huntsville service area at the normally closed divide between these two service areas. A limited amount of water can be transferred between the Ceasetown and Huntsville service areas.

WASTE WATER FACILITIES

On the Nesbitt plant site are two (2) lined earthen lagoons used to store residual solids of the filter backwash water. After the wastes have settled, the clear supernatant is either recycled to the plant influent or discharged into the adjacent stream in accordance with an NPDES permit.

On the Huntsville plant site are two (2) lined earthen lagoons used to store residual solids of the filter backwash water. After the wastes have settled, the clear supernatant is discharged into the adjacent stream in accordance with an NPDES permit.

NEW CASTLE

The New Castle Area serves the City of New Castle; the Borough of South New Castle; and portions of Hickory, Mahoning, Neshannock, North Beaver, Shenango, Taylor and Union Townships, as well as portions of New Beaver Borough. The estimated population served is 42,998.

SOURCE OF SUPPLY

Source of supply is obtained from the Shenango River. Stream flow is regulated by the Pymatuning Dam, a flood control project located 35 miles upstream, and Sharpsville Dam, 20 miles north of the pump station. Two timber crib intakes are located in the river at the main station, and water is delivered to a stone masonry low-service suction well with a 16-inch and a 24-inch cast iron pipeline. Three vertical low service pumping units deliver the water to two sedimentation basins, 250 feet east of the main pump station.

TREATMENT

The chemical room is on the south end of the main station and contains two 7,000-gallon liquid alum tanks, a day tank, two alum pumps, four polymer pumps, a powdered activated carbon feeder and a caustic soda feed system, located in an adjoining room. Adjacent to the west wall of the chemical room is the corrosion inhibitor room, which contains one 4,760-gallon bulk tank, a day tank and two corrosion inhibitor pumps. Outside the Northeast wall of the chemical room is where the fluoride room are located. The Fluoride room contains a 5,000-gallon bulk tank, a day tank and two fluoride pumps. A potassium permanganate feeder is located adjacent to the Low Service pump area. Chemical containment is provided around all chemical storage tanks and feeders to prevent the accidental release of water treatment chemicals. The liquid lime building is located adjacent to the sedimentation basins and includes two 8,000-gallon bulk tanks and liquid lime feed equipment.

The control room area is adjacent to the chemical room comprised of several separate rooms. The mix room contains two mixing tanks for adding various chemicals to the 20-inch raw water line, which runs directly under this side of the building. Across from the mix room contains the chlorinator room, and chlorine storage room complete with scales and monorail for changing cylinders. The control panel for monitoring the entire plant is located in the actual control room where the various analyzers and alarm systems and annunciators are housed. In recent years, a SCADA system has been added in which the various treatment turbidities, filter and plant flows, distribution system tank levels, flows and pressures have been integrated to, in addition to the control of several chemical feed systems and the Low and High Service pumps. Monitoring and record keeping is accomplished via SCADA. A secondary, full function SCADA computer can also be found in the laboratory.

There are two 1.0 mg sedimentation basins 250 feet east of the main station, which under normal operating conditions, are in series but can be operated one at a time for cleaning and maintenance purposes. No. 1 basin is equipped with three baffle walls and between these walls are eight vertical flocculators. The water is collected in a launder at the north end of the basin and passes through a flume to No. 2 basin. Water is again collected in a launder at the north end and flows by gravity to the filter building approximately 100 feet west of No. 1 basin. The basins are covered to prevent freezing of the sludge collection equipment and collection of leaves and debris in the bottom of the basin that might damage equipment.

The filter building contains four, 2.1 mgd filters complete with surface wash and air wash. Filter-to-Waste valves & piping are included on all four filters. The media consists of 10-inches gravel, 5-inches silica sand, 3-inches garnet sand and 54 inches of granular activated carbon. There are two 60 hp, vertically mounted double-suction backwash pumps. Filtered water is delivered to the clearwell adjacent to the filter building by a 24-inch line.

DISTRIBUTION STORAGE

The Main Service system storage capacity consists of the Pulaski tanks. These are two, 1.75 MG ground storage tanks. The High Service system storage is comprised of the McQuiston tank, a 1.1 MG ground storage tank; Winter Road tank, a 1.0 MG elevated storage tank; West Pittsburgh tank, a .410 MG ground storage tank; and the Pearson Park tank which is a .300 MG elevated tank and the Castlewood tank, a .300 MG elevated tank.

DISTRIBUTION

Topography of the service area necessitates service at two pressures: main service for most of the business and industrial areas of New Castle, and high service for the remaining areas. The distributive pumps for these areas include six vertical turbine pumps. Three of the pumps serve the main service system, and three of the pumps serve the high service system.

The High service pumps discharge to mains that provide service to the upper gradients of the system. This system is primarily serviced by the McQuiston tank and the Winter Road Tank. The Pearson Park system provides service for areas north and east of the McQuiston tank. Three pumps located at McQuiston tank supply the Pearson tank. These pumps take suction from the McQuiston tank and pumps into a 0.300 mg storage tank in Pearson Park south of Mitchell Road and west of Mercer Road. McQuiston floats with the Winter Road tank to provide storage for the high service gradient.

Winter Road and Shenango boosters are pressure sustaining boosters on the High Service system. Both of these systems are operated via a SCADA system and can be operated either remotely from the plant or automatically at the station. LeClair Booster is another pressure sustaining booster that serves a small portion of Hickory Township.

West Pittsburg tank is regulated through the use of a pressure regulating station located on Savannah Rd. This station is also operated through a SCADA system and has the same functionality as the booster systems.

The Castlewood gradient draws from the high service gradient to supply water service to additional areas of southern Shenango Township and is supplied by the Castlewood Pump Station.

WASTE WATER FACILITIES

The existing sludge room is located on the north end of the main station and houses an air compressor, four chemical feed pumps, a chemical mixing tank and a filter press to de-water the sludge. A residual sludge thickener system is also located at the plant. A sludge holding tank with a capacity to store approximately 120,000 gallons of residual sludge is included to provide adequate sludge storage and provide for proper treatment for eventual belt pressing of the sludge for disposal. The residual sludge thickener system also provides for pumping facilities to move the residual sludge from existing basins and filter backwash to the belt press. The residual sludge is removed from the plant by a contractor and used in topsoil blends.

NITTANY

The Nittany system is located approximately 45 miles east of PAWC's Philipsburg system and 20 miles west of PAWC's Milton system in Walker Township, Centre County and Porter Township, Clinton County. The system serves approximately 1,600 people through 530 connections. The system consists of a single well, a storage tank and distribution network.

SOURCE OF SUPPLY

The well for the system is located approximately 1,200 feet west of Nittany Ridge Road in a predominantly wooded area. The main well pump and the spare pump are both 30hp, submersible pumps that are able to supply 0.374 MGD. The well is permitted for 300 gpm (0.432 MGD). The well operates automatically based on tank level.

TREATMENT

The Nittany Treatment Facility can process 0.432 MGD. The raw water is treated with sodium hypochlorite for disinfection. The facility consists of a small block building located on site between the well and the tank at 500 Nittany Ridge Road, Howard, PA. The water is pump directly from the well, through the treatment building and into the tank. Water flows by gravity to the distribution system.

DISTRIBUTION STORAGE

Distribution storage consists of a 0.289 MG glass lined bolted steel standpipe and is available for fire protection purposes and general usage.

DISTRIBUTION

The system consists of approximately 12 miles of pipe ranging in size from 2 inch to 12 inch and one PRV station located in Porter Township along Nittany Ridge Road to create a second gradient for the majority of the Porter Township.

Pennsylvania American Water Company
Norristown Water System Description

The Norristown area serves Bridgeport Borough, Norristown Borough, East Norriton Township, West Norriton Township and portions of Upper Merion, Plymouth, Lower Providence, Whitpain, Worcester, Whitemarsh and Perkiomen Townships.

SOURCE OF SUPPLY

The Schuylkill River serves as the primary source of supply in the Norristown area and accounts for about ninety-nine (99%) percent of the source of supply. The balance of supply comes from a purchased water connection with the North Wales Authority in Whitpain Township. The four (4) wells located in Perkiomen Township have been retired. Emergency connections exist with Aqua Pennsylvania in Upper Merion and North Penn Water Authority. An additional emergency connection exists with the North Wales Water Authority in Whitpain Township.

TREATMENT - SURFACE SUPPLY

Water enters an intake with bar racks located in the south channel of the Schuylkill River and flows through two (2) dual 36" intake pipes. The intake pipes allow provision for appropriate chemical pretreatment and can deliver 18 mgd each to the treatment plant. The chemical pretreatment consists of potassium permanganate for disinfection and polymer for Zebra mussel control. The raw water pumps each have a capacity of 9.0 mgd each and are equipped with variable frequency drive units.

The high service pump suction header is located on the east end the distributive clearwell in the distributive pump station. Four pumps rated at 4 MGD, 8 MGD, 8 MGD, and 6 MGD, respectively, discharge finished water into the Norristown distribution system. From the plant, water is conveyed through transmission lines ranging from 16" to 36". Each pair of high service pumps are rated at 6.0 MGD and 8.0 MGD. The entire plant has a reliable rating of 18 MGD.

DISTRIBUTION SYSTEM

Finished water storage in the distribution system totals 9.77 MG. This is provided by two 2.8 MG ground storage tanks, located at the DeKalb booster pump station, a 0.25 MG ground storage tank, located at Curren Terrace, a 2.0 MG ground storage tank, located in East Norriton, a 0.5 MG ground storage tank, located in West Norriton, a 1.0 MG elevated tank located along Church Road, and a 0.42 MG ground storage tank, located in Evansburg.

The Norristown distribution system operates on six (6) primary system gradients. The Norristown Main Service, Bridgeport Main Service, Suburban Main Service - DeKalb, Suburban Main Service - Forrest, Suburban High Service- Church Road, and the Perkiomen System. A total of eight booster stations are situated throughout the distribution system.

The Norristown Main Service gradient is supplied by the treatment plant and serves mostly Norristown and portions of West Norriton and Plymouth Township. Water from the plant is pumped to the DeKalb booster pump station storage tanks, which float on this gradient.

The Bridgeport Main Service is served by the Swede Street Relay station. It takes suction from the Norristown main service and supplies water to the borough of Bridgeport and the Bridgeport booster station. The Bridgeport booster station takes suction from this gradient and serves a small portion of Bridgeport Borough and Upper Merion Township.

The Suburban Main Service - DeKalb is served by the DeKalb booster station. The station supplies water north and west of the Borough. The pumps take suction from the DeKalb booster pump station ground storage tanks and deliver water to the East Norriton ground storage tank. The tank floats on system pressure. The Belfry and Bluebell boosters are small underground stations that deliver water to portions of Whitpain and Whitemarsh Township. The New Hope pressure reducing valve (PRV) delivers water to Norristown and the Curren Terrace ground storage tank. This system also serves portions of Plymouth Township and Norristown Borough.

The Suburban Main Service - Forrest is served by the Forrest Avenue booster station. The booster station takes suction from the Norristown Main Service gradient and delivers water to the western and southern parts of the service area. Water is supplied to the West Norriton ground storage tank, which floats on this system, which supplies portions of Lower Providence, East and West Norriton townships and Norristown borough. Both Suburban Main Service gradients are interconnected.

The Suburban High Service is served by the Providence booster station. The booster station takes suction from the West Norriton ground storage tank and supplies water to the Church Road elevated tank and the Montgomery County Prison Farm elevated tank (privately owned). The gradient serves portions of Lower Providence, Worcester, and East and West Norriton Townships. A PRV Station located along Germantown Pike reduces pressures to customer in the far western portion of Lower Providence Township.

The Perkiomen system is served by a pipeline from the Suburban High Service via the PRV along Germantown Pike. The Evansburg rechlorination station boosts chlorine at this point in the system.

OLWEN HEIGHTS WATER SYSTEMS

The Olwen Heights Water System of Pennsylvania-American Water Company supplies potable water for domestic and municipal use for residential customers in Roaring Brook Township, Lackawanna County.

SOURCE OF SUPPLY

Olwen Heights is a groundwater system that consists of three wells, Well #1 permitted for 60 gpm (86,400 gpd), Well #2 permitted for 45 gpm (64,800 gpd), and Well #3 permitted for 90 gpm (129,600 gpd).

WATER TREATMENT

Raw water is pumped directly into the Well #1 treatment building where chlorine is added for disinfection. The water then flows to a 1,200 gallon chlorine contact tank. Well #1 is metered and controlled by the pressure in the distribution system.

Raw water is pumped directly into the Well #2 treatment building where chlorine is added for disinfection. The water then flows to two 554 gallon chlorine contact tanks. Well #2 is metered and controlled by the pressure in the distribution system.

Raw water is pumped directly into the Well #3 treatment building where chlorine is added for disinfection. The water then flows to the 100,000 gallon storage tank. Well #3 is metered and controlled by the elevation in the storage tank.

DISTRIBUTION STORAGE

Distribution storage is provided by a 100,000 gallon storage tank.

DISTRIBUTION

The distribution system consists of 2-inch through 8-inch pipe and is a combination of PVC and ductile iron material. The system operates on two pressure gradients; the average pressure in both gradients is 50 psi. There is an emergency pump station that can pump water from the lower to higher pressure gradient when required. There are only two (2) fire hydrants installed on this system.

Pennsylvania American Water Company
Penn Water System Description

PAWC – Penn Water System serves the customers within Wyomissing, West Lawn, and Sinking Spring Borough and portions of Lower Heidelberg, South Heidelberg and Cumru Townships in Berks County. This water system is divided into eight (8) pressure zones. Water can be transferred from one zone to another via pumps or automatic flow control pressure reducing stations.

DISTRIBUTION

Mountain Tank Zone source of supply include Wells Nos. 12, 13, 16 and 18, and pumps to two 500,000-gallon ground storage steel tanks (Mountain Tanks 1 & 2) located adjacent to Well No. 13 on the north slope of Grings Hill.

The Blanton Booster Station creates the pressures in the Blanton Zone. The booster station is located adjacent to the two 500,000 gallon tanks. (Mountain Tanks 1 & 2) discussed in the Mountain Tank Zone above. The booster station utilizes the storage tanks as suction reservoirs and has the capabilities to pump water to higher elevations on Grings Hill. The Blanton Zone can provide water to the 250,000-gallon storage tank (Grings Hill Tank) in the Grings Hill Zone. This booster station consists of three pumps with a combined capacity of 850 GPM, a hydro-pneumatic tank, and a diesel-powered emergency generator to provide continuous service in the event of a power outage.

Grings Hill Zone receives water supplies from Well No. 23 and the Blanton Booster Station pumping to the 250,000 gallon steel storage tank (Grings Hill Tank) located on the ridge of Grings Hill. The water pumped from the hydro-constant pump, which is housed in the new Regulating Station, provides water to the higher elevations of Grings Hill.

Shiloh Hills Zone covers the Shiloh Hills development located in the southeast portion of the service area. This zone is provided service by the Shiloh Hills Booster Station, which boosts the water and pressures from Grings Hill Zone to the customers in the Shiloh Hills Zone. The booster station consists of three pumps with a combined capacity of 1,000 GPM, a hydro-pneumatic tank, and a diesel-powered emergency generator to provide continuous service in the event of a power outage.

Wyomissing High Zone receives water supplies from Wells Nos. 19, 20, 21 and Well 28 pumping to a 400,000 gallon elevated spheroid tank (Wyomissing Hills Elevated Tank) located on Grandview Boulevard in Wyomissing Hills. The Stief Farm pressure-regulating valve located on Columbia Avenue at Huron Boulevard also transfers water to this zone from the Mountain Tank Zone , and water purchased from Western Berks Water Authority at a connection on State Hill Road also provides water to this zone when required in an emergency.

Wyomissing Low Zone pressures are regulated by the 570,000-gallon steel storage tank (Wyomissing Hill Low Tank) located adjacent to the Wyomissing Hills 400,000 gallon elevated spheroid tank on Grandview Boulevard. Water is supplied to this storage tank from the

Wyomissing High Zone through a pressure-regulating valve located in the Wyomissing Hills Booster Station and from the Mountain Tank Zone through a pressure-regulating station located on Shillington Road, between Hiester Avenue and Spohn Road.

The Wyomissing Hills Booster Station is located adjacent to the 400,000 gallon elevated tank (Wyomissing Hills Elevated Tank) and the 570,000 gallon ground storage tank (Wyomissing Hills Low Tank). In addition to having a pressure-regulating valve for transferring water from Wyomissing High Zone to the Wyomissing Low Zone, the station has three booster pumps to transfer water from the ground level tank to the elevated tank (Wyomissing Low Zone to the Wyomissing High Zone). The booster station consists of three pumps with a total capacity of 825 GPM and pressure sensing automated controls between the elevated tank and the wells and the Stief Farm valve. In addition, through Cushion Peak Regulating Station, Wyomissing High Zone can be supplemented by the Cushion Peak Zone when PSI drop to a set point.

The Meridian Zone is located in the northern region of the service area, consists of two pressure regulating valves, supplying water to a 1.0 million gallon storage tank (Spring Ridge Tank) located in the Spring Ridge Development. The two pressure regulating valves, one located on Broadcasting Road at Westview Drive and the second valve located on Van Reed Road at Village Drive, transfer water from Wyomissing High Zone to this Zone.

The Cushion Peak Zone was created in 2003 and consists of a booster station with 225 GPM pumping capacity and the Cushion Peak 500,000 gallon steel tank located in the southwest portion of the service area.

PITTSBURGH

The Pittsburgh operation serves the 29th, 30th, 31st and 32nd Wards and portions of the 16th, 18th, 19th, 20th and 28th Wards of the City of Pittsburgh. The Boroughs of Baldwin, Bethel Park, Brentwood, Bridgeville, Carnegie, Castle Shannon, Crafton, Dormont, Dravosburg, Finleyville, Green Tree, Heidelberg, Homestead, Ingram, Jefferson, Munhall, Mount Oliver, Oakdale, Pleasant Hills, Rosslyn Farms, Thornburg, West Homestead, West Mifflin, Whitaker and Whitehall. The Townships of Baldwin, Collier, Scott, South Fayette, South Park, Union and Upper St. Clair; the Municipality of Mt. Lebanon, and portions of Cecil, Peters, Robinson and Nottingham Townships. The estimated population served is over 360,000.

SOURCE OF SUPPLY

Raw water is taken through two intakes along the Monongahela River. The Becks Run Intake is located about 4.5 miles upstream from the confluence of the Allegheny and Monongahela Rivers at the Pittsburgh Triangle and the E.H. Aldrich Intake is located about 21 miles south of the Becks Run Intake and further upstream near the Allegheny/Washington County line.

In addition to the Hays Mine and E.H. Aldrich facilities, there is a stand-by connection with the Pittsburgh Water and Sewer Authority. The connection between the Company and the Authority is able to provide a supply of water between 4 mgd and 12 mgd to the distribution system. This connection is utilized by pumping water through our Mt. Washington Booster Station.

The intake structure at Becks Run Station consists of two passive barrel type raw water intake screens with air burst that supply two 42-inch raw water lines that deliver water by gravity to a 72-inch suction header. This suction header, which is located at the bottom of the Becks Run pump station, provides suction to four (4) 20 mgd vertical turbine raw water pumps for a reliable capacity of 60 mgd. The raw water is delivered from the Becks Run Station to the Hays Mine purification facility, located about two miles southeast from Becks Run Station, via a number of raw water transmission mains. A 42-inch ductile iron line extends to a valve nest at Becks Run Road and Bajo Street and thence continues as three 24-inch cast iron lines to a valve nest at Becks Run Road and Agnew Road, adjacent to Hays Mine Pumping Station. From this point the three 24-inch mains converge with connections to two 48-inch prestressed concrete cylinder lines leading to the degritting tank. The fourth line from Becks Run Station is a 36-inch prestressed concrete cylinder pipe and ties in directly to the 48-inch lines.

At the E.H. Aldrich Station, raw water is taken from the Monongahela River and processed in a like manner as the Hays Mine facility. The inlet portion is provided with a roughing bar rack, the center portion with two traveling screens and the third section contains a chamber that serves as low-service suction well. Potassium permanganate can be added at this point. Five vertical turbine-type pumping units are installed with a total capacity of 70.3 mgd. All pumps discharge into a single header that is connected to a 42-inch prestressed concrete cylinder raw water transmission line. There is also a second, 42-inch ductile iron raw water transmission main to the plant.

TREATMENT

In 1990, three superpulsators were installed at the Hays Mine Station for the purpose of treating the water. The superpulsators are the latest technology in water treatment and give the plant a nominal treatment capacity of 60 mgd. The water from the degritting basin flows through two 54-inch prestressed concrete pipes through the mixing vault where the treatment chemicals are added. The chemicals utilized for the treatment are caustic soda, ferric chloride, sodium permanganate, cationic polymer and powdered activated carbon. After the addition of the chemicals, the water passes through a rapid mixer for even dispersion of the chemicals into the raw water. The 54-inch lines then continue to the weir box at the entrance to the three superpulsators. At the weir box, the water is evenly divided and dispersed to the treatment units. In the treatment units, the entire treatment process takes place. This includes flocculation, sedimentation, and clarification. From the superpulsators, the water is distributed to the 40 granular activated carbon filters at the plant by the way of three 48-inch connections. The units are so designed that any one unit can be taken out of service for maintenance and the flow rates through the plant can be maintained.

From the filters, the water flows to the collection clearwells where post-treatment chemicals are added. These chemicals include sodium hypochlorite (bulk liquid), fluoride and a corrosion inhibitor. The water then flows to the two primary clearwell tanks where aqua-ammonia is added after the clearwells to form chloramines before it is pumped to the distribution system.

The E.H. Aldrich facility consists of eight Aldrich purification units, a control building, two steel standpipe wash water tanks, a chemical application room and slurry activated carbon storage bins.

The control building houses the chemical storage tanks with feed and pumping equipment, the central control room for the purification and pumping facilities, and the high service and wash water pumps. Emergency generators are located in separate enclosures. A separate chemical feed building houses storage and feed equipment for sodium hypochlorite and aqua-ammonia.

Water from the purification units flow by way of a 60" pipeline to a 4.2 M.G. clearwell basin located directly across Elrama Road from the control building. Water from this clearwell flows to a smaller clearwell with a capacity of .95 M.G. located below the ground floor level of the control building. The high service and wash pumps take suction from this clearwell.

All eight Aldrich purification units are identical. Each unit is a covered basin and is comprised of three concentric steel shells mounted on a concrete base. The central portion is equipped with a type "W" Dorr-Oliver Hydrotreator, having four arms, two of which are equipped with residue rakes to convey settled residue to a well from which it is blown off to waste. The influent pipe is located below the tank bottom and connects to the central riser pipe, from which the distributing arms are suspended. From the settling compartment, the water flows over a weir into the filter compartment. The filter has a width of 6 feet 6 inches and extends

around the periphery of the tank shell. The media used in these filters is granular activated carbon. The third and smallest ring forms the drain trough for collection of backwash water and draining the outer portion of the unit.

The 42-inch raw water transmission mains enter the station at the chemical feed room. At this point ferric chloride, caustic soda, sodium hypochlorite and activated carbon are added as needed. The chemically treated water then flows on through the 42-inch pipe to the valve houses, from which it is distributed to the eight Aldrich purification units through 20-inch lines. After filtration, the water passes through a rate controller and flows to the clearwell. Additional chemical treatment includes provisions for post sodium hypochlorite, caustic soda, hydrofluorosilic acid and a corrosion inhibitor that is added to the filtered water inlet of the clearwater basin. Aqua ammonia is added to the final clearwell near the pump suctions to form chloramines before it is pumped to the distribution system.

Five high service pumps are located in the control building with a total rated capacity of 70 mgd.

DISTRIBUTION STORAGE

There are six steel reservoirs located at various locations, they are: Shire Oaks No. 1, Shire Oaks No. 2, Rocky Ridge No. 1, Rocky Ridge No. 2, Rocky Ridge No. 3, West Mifflin. Two steel elevated tanks are located at Castle Shannon and Green Tree. There are two steel standpipes at Finleyville: Finleyville No. 1, and Finleyville No. 2.

DISTRIBUTION

The Hays Mine Pump Station is located on Becks Run road approximately 200 yards from the Hays Mine Treatment Plant. Four (4) 20 mgd horizontal centrifugal pumps provide a reliable pumping capacity of 60 mgd..

The Shire Oaks Relay station is located one mile west of the E.H. Aldrich facility. The station consists of two 5 mg ground- level storage tanks and a building housing five horizontal centrifugal pumping units with a rated capacity of 70 mgd. Two (2) 48- inch transmission lines from the E.H. Aldrich station connects the relay station tank. The pumps take suction from the storage tanks and relay the water into the distribution system through two 48-inch prestressed concrete cylinder lines.

There are also eight booster stations throughout the system located at Morton Plan, Gladden Heights, Rocky Ridge, South Fayette, Pinkerton, Thornburg, Rosslyn Farms and Mount Washington. A series of PRV Stations serve the lower elevations areas along the Chartiers Valley and the greater Homestead area.

WASTE WATER FACILITIES

At the E. H. Aldrich Station, all of the treatment residue which consists of backwash water, solid blowdowns, and any treatment unit draindowns, all collectable in a 750,000 gallon capacity clarifier. The solids are settled out and drawn off at the bottom of the clarifier and pumped to one of the two lagoons for further drying. The supernatant is drawn off at the top of the clarifier and returned to the river under the guidelines of our existing NPDES permit.

This beneficial use of our dried residue was made possible by having the material de-wasted by the Pennsylvania Department of Environmental Protection.

At the Hays Mine Station, waste water treatment facilities include a backwash water holding tank where the backwash is collected and pumped to two clarifiers on Madeline Street. At the clarifiers, the heavier material is settled out and pumped to the gravity thickeners. The supernatant from the settled water is then recycled through the plant treatment scheme. Residue sediment from the de-gritting tank is also pumped to the gravity thickener. Once the residue has been thickened, it is stored in a holding tank. From the holding tank, the residue enters the transfer pump station and is pumped to the solids dewatering building.

At the solids dewatering building, facilities are in place for the addition of polymers to aid in the dewatering of the residue. Also located at the dewatering building are four belt presses. The residue treated with the dewatering polymers is introduced to the belt presses and the water content of the residue is reduced. The residue then travels on a conveyor and is deposited in one of four receiving bins on the lower level of the building.

The dried treatment residue is then transported to a holding area where the contractor will either directly apply the material or blend in topsoil to utilize the material for topsoil purposes. The residue at this facility has also been de-wasted the same as the E.H. Aldrich material.

OFFICE FACILITIES

An office to support the operational activities for administrative, engineering, design of new construction facilities for all customers in the Pittsburgh area is located in McMurray.

Greentree Distribution Center contains an office, shop and garage area and is located in the Borough of Greentree. The installation of mains, hydrants and services as well as maintenance and repairs to the distribution system are performed from the location.

The Meter Department located in the Municipality of Bethel Park handles meter reading, customer service work, meter testing and repair work.

Pocono Mountain Lake Forest Community Association

Pocono Mountain Lake Forest is part of Pennsylvania American Water's Lehman Pike District. The system supplies potable water for a small residential community in Delaware Township, Pike County.

SOURCE OF SUPPLY

Pocono Mountain Lake Forest is a groundwater system that consists of two wells; Well #2 and Well #3, both permitted for 144,000 gpd each. Well #2 was drilled to a depth of 609 ft with 42 ft of casing and Well #3 was drilled to a depth of 804 ft with 50 ft of casing. Well #2 is in "reserve" status and is not in use.

WATER TREATMENT

Raw water is pumped directly into the treatment building where it is disinfected with chlorine and then flows to a 55,000 gallon storage tank.

DISTRIBUTION

The distribution system is supplied by high service pumps which pull suction from the 55,000 gallon storage tank and is comprised of primarily 4-inch plastic pipe. The system operates on one pressure gradient with an average pressure of 50 psi. There are no fire hydrants in the system.

Pennsylvania-American Water Company
POCONO

The Pocono system currently serves customers residing in Mount Pocono Borough and Coolbaugh Township, Monroe County. The service territory currently consists of the following developments a Pocono Country Place, Pocono Farms East, Pocono Farms, Pine Hill, Summit Pointe, Stillwater Lake Estates, Lexington Woods, the Village of Tobyhanna and Mt. Pocono Borough.

SOURCE OF SUPPLY

The Pocono System is currently supplied by nine (9) primary and seven (7) stand-by wells.

Carobeth Drive Well (PCP No. 2) supplies the Low service gradient which serves approximately 40 percent of the Pocono Country Place development. The average flow from Well No. 2 is 400 GPM. Supplemental supply is also provided through a 4" control valve from the Victoria Circle tank gradient.

Stony Hollow Circle Well (PCP No. 3) and Shadyside Drive Well (PCP No. 4) supply the High service gradient which serves approximately 40 percent of the Pocono Country Place. The average flow from each of these wells is 100 GPM.

The Coolbaugh Township Well, the Pocono Office Well and Pocono Farms Well #7 supply the Main (Victoria Circle tank) gradient. This gradient includes 20% of Pocono Country Place, Pocono Farms, Pocono Farms East, Lexington Woods, Pine Hill and Tobyhanna Village. The average flow from the Coolbaugh Twp Well and Pocono Farms Well #7 is 500 GPM and 250 GPM respectfully. The average flow from the Pocono Office Well is 150 GPM.

The Pocono Mountain Industrial Park Well, the Pine Hill Well, and the Summit Pointe Well supply the Mount Pocono Gradient. This gradient includes the Pocono Mountain Industrial Park, Stillwater Lake Estates, Summit Pointe, and the Borough of Mt. Pocono. Average flow from the Pocono Mountain Industrial Park Well is 270 GPM. Average flow from the Pine Hill Well and Summit Pointe Well is 60 GPM and 70 GPM respectfully.

TREATMENT

Treatment facilities are provided at each well site. Chemical treatment includes dosing of sodium hypochlorite, caustic soda, and a corrosion inhibitor. The treatment structures are equipped with SCADA analyzing equipment, and all necessary safety and containment equipment. All treatment processes are automatically controlled and monitored at the PAWC operations center.

DISTRIBUTION

The majority of the distribution system consists of 3”-12” PVC, ductile iron, and asbestos cement water main. Fire hydrants are located throughout most of the system. The Country Place Drive Booster Pump Station delivers water from the Main gradient to the High gradient via two (2) 0.232 MGD pumps. Pressure reducing valves are provided in low areas of the distribution system to reduce pressures as needed.

DISTRIBUTION STORAGE

The Main service gradient contains a 0.49 MG storage tank referred to as the Country Place Drive tank.

The High service gradient contains an elevated 0.40 MG storage tank referred to as the Highview Terrace tank

The Main (Victoria Circle tank) gradient contains an elevated 0.5 MG storage tank referred to as the Victoria Circle tank.

The Mount Pocono gradient contains a 0.10 MG elevated storage tank referred to as the Pocono Mountain Industrial Park tank, and a 0.108 MG storage tank referred to as the Pine Hill tank.

PUNXSUTAWNEY

The Punxsutawney area serves the Boroughs of Punxsutawney and Big Run, and portions of Bell, Gaskill, Young and McCalmont Townships. The estimated population served is 8,500.

SOURCE OF SUPPLY

The sources of supply that are used include the East Branch of the Mahoning Creek, and three operating wells at the filtering plant and pumping station. The East Branch is pumped into a settling basin near the filter building as does the supply from the wells.

TREATMENT

Hydrated lime, ferric chloride, and chlorine are introduced into a rapid mix chamber and are controlled automatically by a pH analyzer, and chlorine residual analyzer, respectively. Provision is also made to feed potassium permanganate at this location if necessary. Water then passes to the flocculating chamber and through the sedimentation basin. Settled water is pumped by low service pumps to four filters.

Chlorine and a corrosion inhibitor are introduced to the filtered water in route to the clear well tank; this is controlled automatically by a chlorine residual analyzer and by flow-pacing.

The ferric chloride is fed into the rapid mix chamber by metering pumps that are preset, one pump for surface water and one pump for each of the wells.

DISTRIBUTION STORAGE

The Punxsutawney main gradient includes the 2 MG West End Reservoir. The North Main St gradient includes the .300 MG Adrian Hospital Tank and the Anita gradient includes the .200 MG Anita tank.

DISTRIBUTION

Two variable speed vertical pumps at the treatment plant provide service to the Punxsutawney main gradient through two 12” mains. The North Main St. booster delivers water North Main Street gradient, and the Anita booster delivers water to the Anita gradient. The South Main, Rockland Avenue and Fairview boosters all deliver pressure to higher elevations in the surrounding areas.

WASTE WATER FACILITIES

Filter backwash flows by gravity to a wastewater holding tank where the solids are allowed to settle before the clear supernatant is returned to the stream. Settled sludge from the wastewater holding tank and settling basin is pumped into a drying bed located on the plant property. The sludge is allowed to dry and the de-wasted material is removed and is typically land applied as a soil amendment for beneficial use.

Pennsylvania American Water Company
Royersford Water System Description

PAWC – Royersford water system serves the Borough of Royersford and Borough of Spring City and Limerick Township, Upper Providence Township, East Vincent Township, East Pikeland Township and East Coventry Township.

SOURCE OF SUPPLY

The District's primary source of water supply is the Schuylkill River. The raw water intake and treatment plant are located on the west bank of the river in East Vincent Township, Chester County. The Royersford District also has four wells to augment the river water supply (Well Nos. 1, 3, 4 and EP-1).

TREATMENT

The Shady Lane treatment plant is located in a stone masonry building constructed in 1917. In addition to routine improvements made to the complex from time to time, a chemical feed house was constructed in 1929 and an attached garage and storage room were renovated in 1971. In 1999 the Shady Lane Treatment Plant undertook major renovations and improvements to the treatment plant to increase its operating capacity from 2.0 MGD to 3.7 MGD. The upgrade included all major parts of the treatment process from the intake, raw and finished water pumps, sedimentation basins, filters and underdrains and chemical addition. The treatment plant pumps finished water through a 16-inch cast iron transmission main to the 3.0-million-gallon Dunlap Road distribution reservoir, located about one half mile from the treatment plant.

DISTRIBUTION SYSTEM

Mingo Tank - A 400,000-gallon capacity elevated spheroid tank located in the Village of Mingo, Upper Providence Township.

Limerick Booster Station - A booster pumping station and 1.0 million-gallon ground level storage tank located on Lewis Road were constructed to meet the increasing system demand in Limerick Township. The booster station houses three electric high service pumps with a total capacity of 1,500 gpm, a 1,500 gpm diesel engine pump for emergency use, and a pneumatic pressure tank.

Phoenixville Interconnects - An interconnect located on Camp Council Road to serve various developments in East Pikeland and Upper Providence Townships. A second interconnect with the Borough of Phoenixville became operational through construction of the Sowers Avenue Booster Station located in Upper Providence Township. This masonry building houses three high service electric pumps with a total capacity of 750 gpm.

Black Rock Road Storage Tanks - Two 1.5 million-gallon storage tanks are located on Black Rock Road. Water is pumped from the Sowers Avenue Booster Station to the tanks to serve portions of Upper Providence Township.

2nd Avenue Booster Station - The booster station houses three high service pumps with a total capacity of 1,800 gpm and a diesel engine emergency generator. Water from the booster station is pumped to the Mingo elevated tank for distribution.

Mennonite Road Booster Station - The booster station is located on Mennonite Road in Upper Providence Township that houses three electric pumps with a total capacity of 1,350 gpm. Water from this booster station is pumped to the Black Rock Road Storage Tank to assist in meeting the ever-increasing demand in the Upper Providence area.

Terry Lane Booster Station - The booster station is located in Carrigan Village, Spring City. This booster station utilizes the Dunlap Road reservoir as a suction reservoir and consists of four pumps with a total capacity of 400GPM, a fire pump rated at 1500 GPM and a diesel powered emergency generator. This station provides service to surrounding areas in East Vincent Township and the Merlin Hills system in East Pikeland Township.

Chestnut Point Booster Station – The booster station is located in Upper Providence Township. This booster station consists of three pumps with a total pumping capacity of 575 GPM, a fire pump rated at 2000 GPM and a diesel-powered emergency generator. This station is of masonry construction and was constructed to provide service to the higher elevations in Upper Providence Township.

Black Rock Booster Station - The booster station is located in Upper Providence Township. This booster station was upgraded in 2016 and new consists of three pumps with a total pumping capacity of 400 GPM, a fire pump rated at 1500 GPM and a diesel-powered emergency generator. This station is of masonry construction.

East Coventry Booster Station - The booster station is located in East Coventry Township. This booster station consists of four pumps with a total pumping capacity of 420 GPM, a fire pump rated at 800 GPM and a diesel-powered emergency generator. This station is of masonry construction.

Limerick Tank 2 - The Limerick Tank 2 is a 750,000 gallon elevated tank located on Swamp Pike Road at Ziegler Road. The Norristown Interconnect #1 provides water from the Norristown System in Perkiomen Township to Limerick Tank 2 to supplement the Limerick booster station.

SCOTT TOWNSHIP

The Scott Township System of Pennsylvania-American Water Company supplies potable water for domestic and fire protection use for 6 commercial customers in Scott Township, Lackawanna County.

SOURCE OF SUPPLY

Scott Township is interconnected to Pennsylvania-American Water Company's Abington System via a 12-inch water main.

DISTRIBUTION STORAGE

The system has a 565,000-gallon storage tank.

DISTRIBUTION

The distribution system consists primarily of 6-inch and 8-inch ductile iron pipe. The system operates on a single pressure gradient supplied by the Scott Tech Park Booster pump station which draws suction off the storage tank. Fire hydrants are installed along the water mains and supplied by a fire pump which is also located in the in the Scott Tech Park Booster pump station.

SCRANTON

The Scranton Area Water Purification Plant serves customers in all or portions of North Abington, South Abington, Scott Townships, Archibald, Blakely, Dickson City, Dunmore, Jessup, Moosic, Old Forge, Olyphant, Taylor and Throop Boroughs, and Scranton City in Lackawanna County.

SOURCES OF SUPPLY

The water supply for the Scranton Area Water Purification Plant is taken from the Stafford Meadow Brook, Roaring Brook, and Little Roaring Brook supplies. The reservoirs, which comprise the Stafford Meadow Brook supplies, are Williams Bridge and Lake Scranton Reservoirs.

Williams Bridge Reservoir is a 337 million gallon (Mgal) supply reservoir having a drainage area of 5.2 square miles and a normal pool elevation of 1,358.78 feet. Williams Bridge Reservoir supplies water via stream overflow or discharge directly to Lake Scranton Reservoir.

Lake Scranton is a large 2.49 billion gallon (Bgal) impoundment located on Stafford Meadow Brook just downstream of Williams Bridge Reservoir. The normal pool elevation of Lake Scranton is 1,281.23 feet. Lake Scranton has a drainage area downstream of Williams Bridge Reservoir of approximately 1.5 square miles. This drainage area is small compared to the size of the reservoir and is insufficient to supply the demands of the Scranton Area Water Purification Plant service area. Inflow into Lake Scranton, therefore, depends on water overflowing from the upstream Williams Bridge Reservoir and, more importantly, on water transferred from the Roaring Brook watershed through the Elmhurst/Lake Scranton transmission mains.

The reservoirs, which comprise the Roaring Brook supplies, are Dunmore No. 7, Elmhurst, Curtis, Hollister and Johnson's Pond. Water from the Roaring Brook supplies is transferred to the Stafford Meadowbrook supplies to augment the safe yield of reservoirs on those watersheds.

Hollister Reservoir, the most upstream impoundment on the main branch of Roaring Brook, has a total drainage area of approximately 11 square miles. Hollister Reservoir has a design capacity of 1,350 Mgal, but at the present time the impounded volume of water is temporarily maintained at 182 Mgal. Water is released from Hollister Reservoir into Roaring Brook and flows downstream to Elmhurst Reservoir.

Curtis Reservoir is a 418 Mgal supply reservoir with a 2.2 square mile watershed located on White Oak Run. Water from Curtis Reservoir is used to supplement inflow to Elmhurst Reservoir, which is located immediately downstream.

Elmhurst Reservoir is a 1.22 Bgal supply reservoir located on Roaring Brook in the town of Elmhurst. The spillway elevation is 1,420.81 feet. Including the drainage areas of the upstream Curtis and Hollister Reservoirs, the total drainage area of Elmhurst Reservoir is 35.2

square miles. Water is delivered from Elmhurst Reservoir to the adjacent Stafford Meadowbrook watershed through two transmission mains, which parallel Roaring Brook from Elmhurst Reservoir to Dunmore No. 7 Reservoir and one transmission main, which continues to Lake Scranton Reservoir.

Dunmore No. 7 Reservoir is the most downstream impoundment on Roaring Brook and has a drainage area of approximately 14 square miles downstream of Elmhurst Reservoir. Dunmore No. 7 impounds 107 Mgal and has normal pool elevation of 1,054.17 ft. Dunmore No. 7 is a standby reservoir, whose supply is capable of being transferred to Lake Scranton via a pumping station at Dunmore No. 7 Reservoir.

Additional water can be supplied to the Roaring Brook watershed by interbasin transfer from the Lehigh River pumping station, which has a 6.0 M.G.D. capacity and is located on the Lehigh River. The Lehigh pump is utilized only during extreme dry weather periods.

The supply reservoirs comprising the Little Roaring Brook supplies are Dunmore No. 1, Marshwood, Dunmore No. 3, and Dunmore No. 4 Reservoirs. The total drainage area of the lowest reservoir in the Little Roaring Brook system, Dunmore No. 1 Reservoir, is 2.7 square miles.

Dunmore No. 1 Reservoir has a total capacity of 75 Mgal and a normal pool elevation of 1,212 feet. Water is supplied to Dunmore No. 1 Reservoir from three upstream supply reservoirs: Marshwood Reservoir, 54 Mgal; Dunmore No. 3 Reservoir, 18 Mgal; and Dunmore No. 4 Reservoir, 10 Mgal. The pump station at Dunmore No. 7 Reservoir will also permit the transfer of raw water from the Little Roaring Brook supplies to Lake Scranton Reservoir.

The following reservoirs are currently in reserve status and were the water supply for the Chinchilla Water Purification Plant (also in reserve status and scheduled to be demolished by 2023). The major storage reservoirs on Leggett's Creek is Summit Lake, a 210 Mgal supply reservoir on Summit Lake Creek, and Griffin Lake, a 526 Mgal supply reservoir . The remaining supply reservoir, Maple Lake, is located on Summit Lake Creek.

TREATMENT

The Scranton Area plant is located adjacent to Lake Scranton Reservoir between the main spillway and dam structure. The plant has a rated capacity of 33.0 M.G.D. Water supply to the plant is provided by raw water pumping from Lake Scranton Reservoir.

The raw water is pumped from the source of supply directly to the plant where initial pre-chemical additions are made. Pretreatment chemicals include alum, lime, potassium permanganate, activated carbon, and coagulant. After pre-chemicals are added, the water passes through rapid mixing units consisting of three basins in series with mixers. The next step in the treatment process consists of clarification units followed by granular media filtration. Filters are equipped for air/water washing.

After being filtered, water flows through the plant's clear well where many of the post treatment chemicals such as chlorine for disinfection, lime for pH adjustment, and polyphosphate for corrosion control are added before entering the two (2) - 2.5 Mgal storage tanks on the plant site.

On the plant site are two lined earthen lagoons used to store filter backwash water and sludge from the plant's clarification processes. After the wastes have settled, the clear supernatant is discharged into the adjacent stream, in accordance with an NPDES permit.

The Chinchilla plant is located along Route 6 approximately one-quarter mile south of the town of Chinchilla, South Abington Township, and Lackawanna County. This plant is currently in reserve status and the area formerly serviced by the Chinchilla WTP is now serviced by the Scranton area WTP. Water is pumped from the Scranton area distribution system up to the two (2) 1.0 Mgal Chinchilla No. 1 North and No. 2 South storage tanks located on the plant site. The Chinchilla plant is scheduled to be demolished by 2023 and the Chinchilla No. 1 North and No. 2 South storage tanks will remain on the plant site.

DISTRIBUTION

Lake Scranton supplies water from two (2) - 2.5 million gallon water storage tanks (overflow elevation of 1,274) through a 48-inch main (via a tunnel) and through a 42-inch main, both installed through East Mountain to the City of Scranton. Lake Scranton water also flows through inter-system transfer points where it mixes with water from the Nesbitt supply. Lake Scranton water is also pumped through the Nat. West Pump Station to the 0.41 Mgal Glenmaura Nat West storage tank located in Moosic and Scranton. The 0.5 Mgal Austin Heights Tank provides storage on the gravity portion of the Lake Scranton system. On the western end of the 48-inch and 42-inch pipes installed through East Mountain, a 42" transmission main delivers filtered water in a northerly direction through the Mill St. pumping and regulating facility to the areas formerly served by Dunmore No. 7, Dunmore No. 1 and Williams Bridge Reservoirs and Lake Scranton Pavilion. The normal hydraulic gradient of 1,079 for the Dunmore No. 7 service area is established by pressure regulation at the Mill St. facility. The No. 7 service area consists of areas of low elevation bordering the Lackawanna River. A portion of the water feeds the Hollow Avenue Pump Station, which delivers it north along Route 6 to Eynon. The 0.4 Mgal Bell Mountain and 0.75 Mgal Route 6 Storage Tanks (overflow elevation of 1,400 $\pm$) provide storage capacity along the Route 6 pumped system. Water is delivered to the 0.315 Mgal Dickson City Tank through the Layborne St. Pump Station The maximum hydraulic gradient of 1,247 for the Dunmore No. 1 service area is established by modulating a butterfly valve at the Mill St. facility to control the level of the 1.9 Mgal Dunmore No. 1 Tank. The Dunmore No. 1 service area is comprised of areas north of Scranton and east of the Lackawanna River. The mid-valley area, which had received its water supply from White Oak and Laurel Run Reservoirs prior to filtration, now receives filtered water through the Riverside and Sturgess Pump Stations. The 1.0 Mgal White Oak Tank (overflow elevation of 1,265) provides storage on this portion of the system. The service areas formerly served from Williams Bridge are established by pressure regulation (low service hydraulic gradient of 1,176) and pumping (high service hydraulic gradient of 1,359) at the Mill St. facility. The low service areas include portions of Scranton and

Dunmore. The high service areas include the higher elevations on the east side of the Borough of Dunmore and portions of Scranton east of Interstate 81, commonly referred to as the Snook service area. The high service pumps at the Mill St. facility deliver water to the 1.9 Mgal Williams Bridge Tank located in the vicinity of the Lake Scranton Pavilion and is controlled by tank level. Water from the Williams Bridge Tank is pumped through the nearby Oakmont Pump Station, to the Bellefonte Tank. The 0.5 Mgal Bellefonte Tank establishes a hydraulic gradient of 1,545.0 for the service area formerly served from the Lake Scranton Pavilion. Water from the Bellefonte Tank gradient is pumped through the Tiffany Drive Pump Station and to the 0.12 Mgal Mt. Margaret Tank which establishes a hydraulic gradient of 1800. In South Scranton, a 36" pipeline 11,000 ft. long carries Lake Scranton gradient water to a pressure regulating station in Dunmore that cuts the pressure and connects to pipelines that are supplying the Dunmore #7, Dunmore #1, and Dunmore #6 gradients. This pipeline and pressure regulating station acts as a secondary feed, operating in parallel, to the Mill St. pump and regulating facility mentioned above.

Hollow Avenue also pumps water to the two (2) 1.0 Mgal Chinchilla No. 1 North and No. 2 South storage tanks at the Chinchilla WTP site. The area formerly serviced by the Chinchilla WTP is now serviced from the Scranton area WTP. Water in the two (2) storage tanks is pumped via the Chinchilla Pump Station north along Route 6 to serve Chinchilla, South Abington Township, Clarks Summit and surrounding area. Water is delivered to the 0.5 Mgal Ivy Industrial Park Tank (hydraulic gradient of 1,738) through the Edella Road Pump Station for service to the Ivy Industrial Park and adjacent area in North Abington Township.

WASTE WATER FACILITIES

On the plant sites are two (2) lined earthen lagoons used to store residual solids of the filter backwash water. After the wastes have settled, the clear supernatant is either recycled to the plant influent or discharged into the adjacent stream, in accordance with an NPDES permit.

STEELTON

PAWC's Steelton system serves the Borough of Steelton and portions of Swatara Township located in Dauphin County. The estimated population served is approximately 6,300.

SOURCE OF SUPPLY

Water is taken from the Susquehanna River. The system also has one emergency interconnect with Suez Water which can supply up to 0.648 MGD on a thirty-day average basis.

WATER TREATMENT

The Steelton Water Treatment Plant is located in Steelton adjacent to the Susquehanna River on Christian Street. The plant has a rated capacity of three (3) million gallons per day (MGD). Water is withdrawn from a shallow water intake structure in the Susquehanna River. After passing through the intake structure and intake pipe, water flows into a wet well and through a traveling screen. Potassium permanganate is added in the wet well for oxidation of organic matter and iron and manganese. Raw water is pumped from the wet well to the treatment building with two (2) vertical turbine pumps rated at three (3) MGD (each). In the WTP building additional "pretreatment" chemical addition of chlorine and alum are made at a mechanical mixer and the water then passes through a flash mixer chamber where lime is added for pH control and alkalinity adjustment and polymer is added to aid in clarifier blanket formation. After the flash mixer water enters the two (2) conventional circular clarifiers. Solids accumulate on the bottom of the clarifier and are periodically removed by gravity and/or recycled back to the flash mix tank with two (2) recycle pumps to aid in coagulation. The clarified water enters piping to convey it to the four (4) conventional filters with dual media consisting of 6" of sand and 24" of anthracite. After being filtered, the water enters piping where final "post" chemical additions of chlorine and soda ash are made before entering the first clear well. Water is then pumped from this clearwell to a new baffled 260,000 gallon clearwell outside the main building. Water from the new clearwell is then piped back into the main building to the two (2) centrifugal finished water pumps rated at 3 MGD (each) and into the distribution system.

DISTRIBUTION STORAGE

There are two (2) adjacent storage vessels in the distribution system located on Kelker Street. Kelker Street Tank No.1 and Kelker Street Tank No.2 have a capacity of 2,000,000 gallons (each). These tanks serve the main gradient and supply water to the Kelker Street Pump Station which serves the high gradient.

DISTRIBUTION SYSTEM

The water treatment plant and Kelker Street tanks supply water directly to the main gradient. The Kelker Street Pump Station supplies customers in the high gradient. This is a completely automatic system consisting of two (2) pumps, together with their associated valves and appurtenances, housed in an above ground structure. Pump operation is controlled by pressure in the high service gradient.

RESIDUALS HANDLING FACILITIES

Residuals from the clarifiers are conveyed to the municipal sanitary sewer. Residuals from filter back washing are conveyed to a backwash waste water pumping station. The filter backwash residuals are normally conveyed directly from the pumping station to the municipal sanitary sewer, but they can also be sent to two (2) backwash water settling tanks where the decanted water is then recycled to the WTP influent wetwell and the settled residuals are sent to the municipal sanitary sewer.

Pennsylvania-American Water Company
SUSQUEHANNA

The Susquehanna district provides water service to customers in the Boroughs of Susquehanna, Lanesboro, Hallstead, Great Bend, Montrose and Thompson; and portions of Harmony, Oakland, Great Bend and Bridgewater Townships.

SOURCE OF SUPPLY

The source of supply for the Susquehanna Treatment plant is from two surface reservoirs and three wells. A concrete dam forms Comfort Lake located on the east branch of Canawacta Creek. Water flows from Comfort Lake via the stream and is collected in Reeds Pond Dam located at the Susquehanna Filter Plant. The plant intake is located in Reeds Pond.

An undeveloped reservoir supply, known as Churchill Lake, is located southwest of Comforts Lake. The 100 MG lake discharges into the South Branch Lake of Canawacta Creek, which joins the East Branch about 1/2 mile below the Susquehanna treatment plant. Additional piping and pumping would be required to use Churchill Lake as a source.

Lake Montrose Reservoir, located just east of Montrose Borough, is fed by springs and surface water, has an estimated capacity of 160 MG, and is the raw water source for the Montrose Treatment plant.

The borough of Hallstead is supplied by finished water from the Susquehanna system and a well. Hallstead Well No. 2 is located in Great Bend Township. Well No. 2 is an 8-inch drilled gravel well. The well is approximately 75-feet deep and is equipped with a submersible pump. The flow ranges from 50 to 100 GPM. A 12-inch ductile iron pipe supplies water to the Hallstead system from the Susquehanna Filter Plant. Hallstead Well No. 2 typically operates continuously.

Thompson water system is supplied by two (2) wells. Thompson No. 1 well is located adjacent to No. 1 reservoir. It is a drilled rock well, 8 inches in diameter and 342 feet deep, equipped with a submersible pump, delivering 36 to57 GPM. Thompson No. 2 well is located at the south end of town. It is a drilled rock well, 8 inches in diameter and 209 feet deep. This well is equipped with a submersible pump delivering 22 GPM. The well discharges into No. 2 reservoir. The well is used as a backup source.

TREATMENT

The Susquehanna Water Treatment Plant (WTP) has a rated capacity of 1.2 MGD. Raw water flows by gravity through a 16” pipe through a flowmeter, and influent valve chamber to the Flocculation chamber. Water then passes through a 100,000 gallon concrete settling basin, two mixed media filters and into a 35,000 gallon clear well basin beneath the filters. The filters are each rated for 1.2 MGD and are manually backwashed. Two high service vertical turbine pumps take suction from the clear well and pump to two steel storage tanks with a combined storage capacity of 180,000 gallons. Equipment is provided for the application of alum and caustic in the raw water pipe, chlorine (gas) at 3 injection points, caustic soda and corrosion

inhibitor in the clearwell, polymer in the flocculation tank and powder activated carbon. The average daily flow for the plant is between 0.4 and 0.5 MGD. A 12-inch transmission main connects the Susquehanna Filter Plant to the Susquehanna distribution system.

Approximately 8 1/2 miles of 12-inch transmission main interconnects the Susquehanna system with the Hallstead system. Filtered water from Susquehanna is controlled to Hallstead via a re-chlorination station. Electric butterfly valves maintain the desired flow rate and system pressure for the Hallstead system. The chlorine residual is also monitored and additional chlorine added if needed. Flow rates and tank levels are transmitted back to the Susquehanna Plant. Hallstead Well No. 2 treatment consists of sodium hypochlorite for disinfection and corrosion sequestering agent.

Raw water from Lake Montrose flows through a 12-inch intake line into the Montrose treatment plant. One of two low service pumps pump the water through a static mixing chamber to a 3-stage flocculation/sedimentation upflow clarifier unit, followed by two .circular steel filters. Finished water flows into a 74,600-gallon concrete clear well. Equipment is provided for the addition of alum, caustic soda, potassium permanganate and polymer for pre-treatment and sodium hypochlorite, caustic soda and corrosion control polyphosphate for post-filter treatment. The average daily flow for the plant is 0.41 MGD.

Treatment facilities at both Thompson Well No. 1 and Well No. 2 consist of dosing of caustic and sodium hypochlorite for disinfection. Both wells are controlled by float switches located in their respective reservoirs.

DISTRIBUTION STORAGE

Distribution storage consists of the 680,000-gallon Reddon Dr. tank in Susquehanna, a 440,000-gallon Valley View Ave. tank in Hallstead, two 375,000 gallon steel reservoirs named Montrose Storage Tank 1 and Tank 2 in Montrose, and the 100,000-gallon Thompson Storage Reservoir at Thompson Well No. 1.

WASTEWATER FACILITIES

Waste treatment facilities consist of two settling tanks at Susquehanna and one settling tank and one rinse tank at Montrose. NPDES permits allow for discharge of tank supernatant to Canawacta Creek for the Susquehanna WTP and Lake Montrose for Montrose WTP.

SUTTON HILLS

The Sutton Hills water system provides service to customers in Jackson Township. The supply consists of one 6-inch well with a depth of 600 feet. The well's average daily output of 13,600 gallons per day is pumped to the 55,000-gallon steel storage tank located at the Sutton Hills well site. Water is disinfected with chlorine prior to entering the tank and is fed to the customers through 4-inch and 6-inch pipes. The distribution system consists of 4-inch and 6-inch ductile iron water mains and there are fire hydrants installed on these mains.

Turbotville Water

The Turbotville Water System of Pennsylvania-American Water Company supplies potable water for domestic, fire protection, and municipal use for approximately 300 customers connections in Turbotville Borough and a portion of Lewis Township, Northumberland County.

Source of Supply

The Turbotville source of supply consists of Warrior Run Spring. The spring is considered to be under the influence of surface water.

The Turbotville spring water collects into a below grade field stone vault, located in a concrete block building built over the vault. Water is pumped from the springhouse to the treatment plant. The spring is operated under water supply permit #4900501. The permitted capacity (pumping and safe yield) is 285,000 gallons per day.

Water Treatment

The treatment plant runs about 6 hours per day at approximately 160 GPM. The Plant produces on average approximately 58,000 GPD. The plant has a permitted capacity of 235,000 GPD. In the springhouse, sodium hypochlorite is fed to the raw water prior to filtration. A chlorine analyzer located in the treatment plant monitors the pre filtration chlorine residual.

The treatment process consists of three sets of parallel treatment trains, each with two stages. Stage one consists of a primary pressure sand filter. Stage two consists of a finishing filter. Each stage is dosed with a polymer. Each filter is equipped with a turbidmeter for continuous monitoring. Turbidity is monitored and reported to the plant SCADA system. The filters are backwashed into a waste holding tank. Solids settle in the tank and the supernatant is recycled back into the treatment process. The plant has a chlorine feed room that feeds sodium hypochlorite from drums.

Once filtered water is treated with chlorine, the water enters a clearwell and flows by gravity back to the springhouse, though not to the same raw water vault. This provides proper disinfection contact time. A chlorine analyzer monitors chlorine residual prior to entry into the distribution system. The springhouse houses the distribution system service pumps. Water is pumped into the distribution system and controlled by system pressure. A generator is available for back-up power.

Distribution and Storage

The distribution system is supplied by pumps located in the springhouse. A generator is available for back-up power for the supply and distribution pumps in the springhouse. The system has approximately 50,000 ft. of mixed size and material piping with some galvanized small diameter pipe. The distribution system has two identical storage tanks each with 298,000 gallons storage, which float on the system pressure. There are approximately 20 public fire hydrants in the system.

UNIONTOWN

The Uniontown area serves the City of Uniontown; and portions of Dunbar, Menallen, North Union, South Union and German Townships. The estimated population served is 20,775.

SOURCE OF SUPPLY

The Uniontown system is supplied by the PAWC Brownsville treatment plant. In addition, water is purchased from the Municipal Authority of Westmoreland County (MAWC).

A connection from the Brownsville Plant to the Uniontown system along Route 40 was completed in 1998. A new booster pumping station was completed in 2000. The new Menallen connection presently allows the transfer of up to 1.5 MGD from Brownsville to Uniontown.

The Mt. Line connection, rated at 3.0 mgd, is located approximately 3 miles from Uniontown and connects the Company's 20-inch main to the MAWC system. Water is pumped to the Uniontown system through the Mt. Line connection from the Uniontown booster station, which is located at the MAWC water treatment plant and has 3 electrically driven pumps and has an emergency generator capable of operating 2 of the pumps in case of a power outage.

The Airport Gradient high service system is supplied by 4 electrically driven pumps located in the Airport Gradient Booster Station. This station has an emergency generator capable of operating 2 of the pumps in case of a power outage.

EMERGENCY CONNECTIONS

The Atlas connection, rated at 0.5 mgd, is located on Route 40 and connects the NFCMA's 16-inch main to the Company's 12-inch main. The installation consists of one 6-inch turbo meter and bypass in an underground concrete vault. The connection is equipped with a check valve to prevent backflow from the Uniontown system into the NFCMA's system. Flow and pressure readings are telemetered to the Uniontown Operations Center. It is used only as a backup source during an emergency.

TREATMENT

At the Menallen connection with the PAWC Brownsville system, a chemical feed station is located on the transmission main to supplement chlorine, corrosion inhibitor, and fluoride feeds as required.

Chloramination facilities are available at the Mt. Line connection with the North Fayette County Municipal Authority for compatibility with chloraminated water delivered from the Brownsville District.

DISTRIBUTION STORAGE

The Menallen Elevated Tank, two North Union Ground Storage Tanks and the Hopwood Ground Storage Tank provide 3.6 million gallons of storage for the distribution system.

DISTRIBUTION

The Revere (0.50 MGD), Mt. Line (3.0 MGD) and Hopwood (0.39 MGD) booster stations are located on the distribution system.

WARREN

The Warren area serves the City of Warren and portions of Conewango, Mead, Glade, and Pleasant Townships. The estimated population served is 12,700.

SOURCE OF SUPPLY

The source of supply for the Warren Area is from eight wells located on Company property or near the pump station. Four wells are operated by direct suction by low service pumping units and discharge into the clear well tank. Wells No. 5, 6, 7, and 8, are equipped with deep well pumps. They discharge directly into the clear well tank.

There is an observation well to monitor the water table on the Glade Run Property.

TREATMENT

Chlorine dosage is controlled by an additive rate controller. Chlorine is added to the clear well tank from the chlorinator located in a chlorine room in the main pump station. Zinc-orthophosphate corrosion inhibitor is fed to the clear well tank.

DISTRIBUTION STORAGE

The two Tanner Hill Tanks with a total of 1.42 million gallons capacity automatically controls the high service pumps No's 6, 7, 8, and 11 based on the level within the tanks. The level is maintained by the SCADA system that controls the distribution pumps.

DISTRIBUTION

Water is pumped from the clear well tank by four high service pumping units and discharged into the distribution system.

A booster station on Cobham Park Road serves residential customers in Glade Township.

Bent Twig Booster Station located on Hill Street serves residential customers in the City of Warren.

WASTE WATER FACILITIES

Due to the quality of the well water in Warren, no waste water is produced in the treatment process.

WASHINGTON

The Washington area serves the City of Washington; the Boroughs of Burgettstown, Canonsburg, East Washington, Frankfort Springs, Houston, McDonald, Midway and West Middletown; the Townships of Amwell, Buffalo, Canton, Chartiers, Cross Creek, Hopewell, Independence, Jefferson, Mount Pleasant, North Franklin, North Strabane, and South Strabane; and portions of the Townships of Cecil, North Fayette, Nottingham, Fallowfield, Hanover (Washington County), Hanover (Beaver County), Peters, Robinson, Smith Somerset, South Fayette, South Franklin, Borough of Claysville, and the Townships of Donegal and East Finley. The estimated population served is approximately 125,000.

SOURCE OF SUPPLY

The primary source of treated water for the Washington area is six pipeline connections with the Pittsburgh Division's facilities. These include a 30-inch metered connection on Irishtown Road, a 24-inch metered connection on Laurel Hill Road, a 20-inch metered connection on McMurray Road, a 16-inch metered connection on Hickory-Grade Road, and 8-inch metered connection on McMurray Road, and a 6-inch metered connection on McVey Street. In addition to these, there are several smaller metered connections to the Pittsburgh Area's facilities.

TREATMENT

The Washington District maintains no active water treatment facilities. The Canonsburg Treatment Plant was retired in June, 1992, although a laboratory, production, and engineering offices remain in this location. Rechloramination stations have been added at the Atlasburg Tank site and the Franklin Malone Tank site in order to help maintain chlorine residuals at the far ends of the McDonald and Claysville area of the system, respectively.

DISTRIBUTION

There are three storage reservoirs which float on the main service system; two in Washington (Washington Reservoir - 2.0 MG, Kish Reservoir - 4.7 MG) and one in Canonsburg (Mapleview Reservoir 5.0 MG). In addition to these there are eleven other storage vessels: the Sanitarium Rd. 0.50 mg steel standpipe, the Mon Road 0.42 mg steel standpipe, the Lincoln Hill 0.10 mg steel standpipe, the McDonald 0.50 mg steel reservoir, the Cross Creek 1 mg standpipe, the Avella 0.125 mg standpipe, the Paris 0.3 mg standpipe, the Bulger 0.125 mg standpipe, the Atlasburg 1.0 mg steel elevated tank, the 0.36 mg pre-stressed concrete Mount Pleasant Tank, the 0.75 mg Franklin Malone Tank, and the 0.25 mg Claysville Tank.

There are also twenty-five booster stations located throughout the distribution system to supply storage vessels and to increase pressures. They are the 0.720 mgd South Main booster station, the 0.720 mgd Quarry Road booster station, the 0.09 mgd Hanna's Knob booster station, the 12.126 mgd Eighty-Four booster station, the 1.95 mgd Paris/Florence Booster Station, the 0.5 mgd Malone Ridge Booster Station, the 1.0 mgd Cross Creek Booster Station, the 2.556 mgd Christy Ridge Booster Station, the 1.0 mgd Avella Booster Station, the 1.5 mgd Gretna Booster,

the 0.75 mgd Franklin Farms booster station, the 1.0 mgd Trinity Point Booster and the 3.3 mgd Rt 980 Booster, the 0.045 mgd Paxton Farms Road booster station, the 0.018 mgd Courson Hill Road Booster station, and the 0.045 mgd Weavertown Pointe booster station. The following boosters are rated for 0.05 to 0.10 mgd: Linden, Snowberry, Spring, Overlook, Keys, Ridge, Saw Hill, DeGarmo Lane and Gladden Heights Booster.

OFFICE FACILITIES

An administrative office located at 300 Galley Rd. in McMurray provides administrative support for the Brownsville –Butler, California, Clarion, Connellsville, Ellwood, Indiana, Kane, Kittanning, Mon-Valley, Moshannon Valley, New Castle, Nittany, Punxsutawney, Uniontown, Warren and Washington.

The Washington meter department, outside commercial department, and distribution departments are also located at 300 Galley Road, McMurray. Meter reading, testing and repairs, and engineering services for construction are also handled from this facility. The installation of mains, hydrants and services, as well as maintenance and repairs to the distribution system, are all controlled from this location.

WEST SHORE

The West Shore area serves the Boroughs of Camp Hill, Lemoyne, New Cumberland, Shiremanstown, West Fairview and Wormleysburg; the Townships of East Pennsboro, Hampden, Lower Allen and portions of the Townships of Silver Spring, Fairview, Newberry and Upper Allen. The estimated population served is 97,126.

SOURCE OF SUPPLY

Water is withdrawn from the Yellow Breeches Creek and the Conodoguinet Creek.

WATER TREATMENT

The West Shore Regional Water Treatment Plant is located approximately three miles southwest of the town of New Cumberland in Fairview Twp, York County. The plant has a rated capacity of twelve (12) million gallons per day (mgd). Water is withdrawn from an impounding reservoir formed by a dam on the Yellow Breeches near New Cumberland Borough. The intake consists of four (4) submerged screens, two (2) along the creeks edge and two mid-stream, all of which are cleaned with a burst of air periodically. Raw water from the Yellow Breeches is pumped with a combination of three (3) pumps, each rated at six (6) mgd, two (2) of which are variable speed, all located in pumping station adjacent to the Creek. Potassium permanganate, an oxidizer chemical, can be fed at that location. The raw water is pumped thru approximately three miles of pipe to the plant where initial "pre" chemical additions (ferric chloride and caustic soda) are made. After these chemicals are added, the water passes through an in-line static mixer and then into a chamber where slower mixing can take place with a mechanical mixer and further chemical additions (chlorine and polymer) can take place. The water enters adjoining distribution chambers before entering into a vacuum chamber where the water is lifted and released to create a pulsating action. The water then enters one of four (4) "superpulsator" clarifiers where inclined plates along with the pulsating action combine to accelerate solids contact and allow for uniform accumulation in a "sludge blanket". Excess waste solids accumulate and concentrate in a trough and are periodically siphoned out.

The clarified water (above the blanket) enters a perforated pipe that leads into a flume that distributes the flow into one of five (5) filters. The filters are conventional units with multimedia including several layers of gravel, sand, and granular activated carbon. After being filtered, the water is piped through a chamber where final "post" chemical additions (chlorine, caustic) are made before entering a 1,500,000 gallon clear well. A project to incorporate UV treatment after the clearwell and before the high service pumps is underway and expected to be complete in 2022. The water is pumped out a pipe adjoining the clear well with three (3) high service turbine pumps into the distribution system. Final chemicals (fluoride and zinc orthophosphate) are added as the water is pumped into the system. Two (2) wash water pumps provide water from the clearwell to backwash the filters.

The Silver Spring Plant is located on the Conodoguinet Creek in Silver Spring Township just upstream form Sample Bridge Road. The plant has a rated capacity of 8.0 MGD. It consists of an intake-pump building, control building, chemical storage and feed building, two

purification units, wastewater clarifier, two (2) clear water tanks and wash water tank. Water flows from the creek through bar racks and two traveling screens into two low lift pump pits. Three low lift pumps deliver water from the pits through the control building into the covered purification units. Water flows from the purification units through UV treatment and then into the two (2) clear water tanks which operate in series. Chemicals are added in the control building, purification units and filter effluent piping. The intake-pump building also contains two wash water pumps and three high lift pumps. The wash water pumps deliver finished water into the wash water tank and the high lift pumps deliver water from the clear water tank into the distribution system.

A new above-ground, 500,000 gallon pre-stressed concrete Clearwell was constructed in 2010 at the Silver Springs Plant. The new Clearwell operates in series with the existing above-ground, 500,000 gallon steel Clearwell constructed in 1969. The new Clearwell is baffled in order to provide 1-log post filtration disinfection required by PA DEP.

DISTRIBUTION STORAGE

There are four standpipes in the distribution system. The Lemoyne Standpipe has a capacity of 407,000 gallons, the Camp Hill Standpipe has capacity of 2,000,000 gallons, the Slate Hill Standpipe has a capacity of 3,000,000 gallons and the Pleasant View Standpipe has a capacity of 750,000 gallons. The Hampden tank is an underground storage tank with a capacity of 1,500,000 gallons.

DISTRIBUTION

The Evergreen Road Booster Station supplies customers in the Reesers Summit and Red Land areas of Fairview Township and customer in Newberry Township. This is a completely automatic system consisting of three vertical turbine pumps together with their associated valves and appurtenances, housed in a buried steel enclosure. The Booster supplies both the Reesers Summit PRV Station and the Pleasantview Tank.

The Reesers Summit PRV Station supplies customers at high ground elevation south and east of I-83 and the PA Turnpike. Water pumped from the Evergreen Road Booster Station to the Reeser's Summit area passes through a pressure reducing valve housed in an underground ground vault.

The Redland PRV Station supplies customers in the Redland area of Fairview Township and Newberry Township. Water passes through pressure reducing valves housed in a combination PRV/Rechlorination Station.

The New Kingstown Booster Station supplies customers on a ridge located north of Route 11 at the western edge of the system. This is a completely automatic system consisting of three horizontal centrifugal pumps, together with their associated valves and appurtenances, housed in a buried steel enclosure.

The Westport Booster Station located in Lower Allen Township currently serves customers in Westport Business Development, Rossmoyne Elementary School, and Fairwind's Residential Development. It is an automatic system consisting of four horizontal centrifugal pumps, together with their associated valves and appurtenances, housed in an above ground steel structure.

The Camp Hill Pump Station is located adjacent to the 2,000,000 gallon Camp Hill Tank and is designed to pump water from the Camp Hill Tank during the day and allow the tank to refill at night. This allows for better turnover of water from the tank and thus better water quality. The Camp Hill Pump Station supplies customers in the main system gradient. It is a completely automated station consisting of three centrifugal pumps, a 12" flowmeter and an 8" back pressure sustaining/pressure relief valve.

The Slate Hill Pump Station is located adjacent to the 3,000,000 gallon Slate Hill Tank and is designed to pump water from the Slate Hill Tank during the day and allow the tank to refill at night. This allows for better turnover of water from the tank and thus better water quality. The Slate Hill Pump Station supplies customers in the main system gradient. It is a completely automated station consisting of three centrifugal pumps, a 12" flowmeter and an 8" back pressure sustaining/pressure relief valve.

The New Cumberland PRV Station supplies customers in the New Cumberland and Fairview Gradient. Water from the West Shore Regional Water Treatment Plant and the main gradient pass through the pressure reducing valves and flow meters located in an above ground building. The PRV station contains two sets of valves to provide individual control to the two gradients that it feeds.

The Wormleysburg PRV Station supplies customers in the Wormleysburg Gradient. Water from the main gradient pass through the pressure reducing valves and a flow meter located in a below grade concrete vault.

Fairfield PRV station - is an underground pressure reducing station consisting of one 6" and two 2" PRV's to reduce water pressure in the Fairfield development located near the intersection of Valley Road and Old York Road in Fairview Twp., York County.

Pinehurst booster pump station - is a small above ground booster pump station consisting of two (2) 3 horsepower (HP) centrifugal pumps to increase water pressure to the Pinehurst development located off of Smith Drive and Adeline Circle in Hampden Twp., Cumberland County.

The Brambles PRV station is an underground pressure reducing station consisting of one 6” and one 3” PRV to reduce water pressure to the Brambles development located off of Carlisle Pike in Hampden Township, Cumberland County.

RESIDUALS HANDLING FACILITIES

At the West Shore Plant, filter backwash water, clarifier sludge blowdown and sample waste is piped to and collected in two (2) wastewater holding basins. It is then pumped to one of two (2) earthen lagoons with two (2) submersible pumps. After the solids have settled in the lagoon, the clear supernatant is discharged into a tributary of the Yellow Breeches Creek, in accordance with an NPDES permit.

At the Silver Spring Plant, filter wash water and purification unit sludge withdrawals are collected in a covered wastewater clarifier. After the wastes have settled, the clear supernatant can flow by gravity at a constant rate to the low lift pump sump pits for recycling through the plant. The thicker sludge which settles to the bottom of the wastewater clarifier is pumped to two lined lagoons. Clear supernatant from the wastewater clarifier and the two (2) lined lagoons can be discharged into the Conodoquinet Creek, in accordance with an NPDES permit, in lieu of recycling.

ADMINISTRATION OFFICE

This region of Pennsylvania-American Water Company's Central Operations is comprised of three distinct and separate areas known as the West Shore (Mechanicsburg Area), East Shore (Hershey Area), and Lake Heritage located east of Gettysburg. These three areas are combined administratively.

All Administrative Management support personnel are headquartered at the Office/Operations Center located at 852 Wesley Drive in Lower Allen Township, Cumberland County. West Shore field services, including distribution, meter reading and service personnel are also based at this location.

Pennsylvania American Water Company
Yardley Water System Description

PAWC - Yardley serves the Borough of Yardley, a large portion of Lower Makefield Township, and a small section of Falls Township.

SOURCE OF SUPPLY

The primary source of supply is the Delaware River. Other supplies include five (5) groundwater wells. Three (3) wells are located at 50 West College Avenue station in Yardley Borough and two (2) wells are located at Highland Drive in Lower Makefield Township. Emergency supplies are also available through interconnections with Morrisville Water Authority and Newtown Artesian Water Company.

TREATMENT

Raw Water from the Delaware River flows by gravity through six (6) intake screens (provisions for 8 total) through two (2) 24" intake lines into a wet well beneath the pump station on the west shore of the river. There is an air scour system in place to allow cleaning of the intake screens. There are also provisions for feeding a solution of Potassium Permanganate for disinfection and Zebra Mussels control.

The raw water pumps consist of three (3) two stage vertical turbine pumps. Each pump is capable of pumping 2100 gpm or 3 MGD. The pumps draw suction from the wet-well. They are equipped with variable speed drives, which allow them to fluctuate, according to the Mill Road Plant clearwell level. These pumps can be run locally or remotely through the SCADA system at the Mill Road Plant control room. A standby emergency diesel generator is on location. Water is pumped from the raw water pump station through a 24-inch transmission main to the treatment plant, approximately 1.6 miles.

The Mill Road Purification Facility, located at 1145 Edgewood near Mill Road in Lower Makefield Township, Bucks County, PA, is capable of producing a reliable yield of 5.4 MGD.

DISTRIBUTION SYSTEM

Standpipe #2, Williams Lane Tank has a capacity of 500,000 gallons. This Steel tank acts as ground water storage from which water is pumped by booster pumps to maintain pressure in the high services gradient of the distribution system.

Standpipe #4, located along Oxford Valley Road, has a capacity of 1,172,000 gallons. This steel tank acts as ground water storage, where it floats on the system to supply the Main Service gradient. There are also three (3) booster pumps, which can be used to supply water to the High Service gradient.

Tank #5 (Big Oak Elevated Tank) has a capacity of 1,000,000 gallons. This steel tank floats on the high service gradient of the distribution system.

Standpipe #6 (Washington Crossing Road Tank) has a capacity of 1,000,000 gallons. This concrete tank and booster station supply water to what is called the Newtown Gradient.

There are six (6) booster stations within the Yardley Area:

The Black Rock Booster Station is equipped with a 520 GPM centrifugal, electrically operated pump. This station is used to deliver purchased water from the Morrisville interconnection if needed.

The Williams Lane Booster Station is equipped with an 840 GPM centrifugal, electrically operated pump, equipped with a variable frequency drive. The pump can be run locally or remotely via SCADA at the Mill Road Plant Control Room. It takes suction from Standpipe #2 to supplement normal supply at high demand and provide adequate pressure in the high service gradient.

The Oxford Valley High Service Booster Station is equipped with one 550 GPM and two 950 GPM centrifugal, electrically operated pumps. These boosters can be used to pump water into the high service gradient from this main service.

The Oxford Valley Main Service Booster Station is equipped with two (2) 15 H.P. pumps operated by variable frequency drives, and a 100 H.P. constant speed pump, for fire flow. The 15 H.P. pumps are used for domestic equalization; and the variable frequency drives are used to maintain constant discharge pressure. The fire pump is designed to provide up to 3,000 GPM at all tank water levels.

The Quarry Road Booster Station is equipped with three 700 GPM centrifugal, electrically operated pumps. These pumps can be controlled locally or remotely via SCADA at the Mill Road Plant Control Room. This station serves what is known as the Newtown gradient, and is also used to fill the Washington Crossing tank.

The Washington Crossing Booster Station is equipped with three 1,000 GPM centrifugal electrically operated pumps. Two of these pumps are equipped with variable speed drives which fluctuate according to system demand. The pumps operate in lead/lag operation. The constant speed pump can be used on especially high demand days or for fire protection. These pumps can be run locally or remotely via SCADA at the Mill Road Plant Control Room. This station also serves what is known as the Newtown gradient. This station has a 125 KVA generator which can run the entire station.

WASTEWATER

Pennsylvania-American Water Company
Blue Mountain Lake Wastewater Treatment Plant Description

Overview

The Blue Mountain Lake Wastewater Treatment Plant was constructed in 1992 and has undergone multiple expansion and improvement projects since then. The plant utilizes a sequencing batch reactor (SBR) – suspended biological treatment system with post-treatment filtration and UV disinfection.

The treatment facilities at the plant include one (1) 45,500-gallon influent equalization tank, two (2) 144,000-gallon SBR tanks, one (1) 48,000-gallon decant equalization basin, a three (3) cell rapid sand filter with an 8,400-gallon clearwell, one (1) 11,400-gallon post-aeration tank, and two (2) aerobic sludge digestion tanks.

The plant has an annual average design capacity of 183,333 gpd as established by NPDES permit #0062464 and by the Delaware River Basin Commission Docket D-1991-014 CP-5. The discharge limitations are based on an average flow of 275,000 gpd. The WWTP is not in a current hydraulic or organic overload condition, nor is it projected to be within the next five years.

A detailed description of the treatment plant and treatment process is outlined below, and a process flow diagram of the treatment process is included as Figure 1.

Process

Wastewater enters the treatment plant through two separate 6” low pressure force mains into a 45,500 gallon in-ground, aerated, concrete flow equalization basin. Since the raw wastewater received at the plant is entirely from individual residential grinder pumps, there is no need for pre-treatment at the plant such as a trash rack, screening equipment, or grinding facilities. The raw wastewater is aerated within the equalization basin with a coarse bubble aeration system.

From the equalization basin, wastewater is pumped into the SBRs for removal of BOD and biological nutrients (nitrogen and phosphorus). The influent flow to the SBRs is controlled by VFD controlled duplex submersible pumps in the equalization basin. Each SBR tank has a fixed-grid fine bubble aeration system, a 5-hp floating mixer, and a floating travelling weir decanter. Sludge from each SBR basin is wasted to the PAD-G Digester with 1-hp submersible pumps.

From the SBR basins, the treated wastewater decants into an in-ground concrete equalization basin with an approximate volume of 48,000 gallons. The decant equalization basin is equipped with a fixed coarse bubble aeration system. The decanted wastewater is pumped from the equalization tank to the three-cell rapid sand filter at a controlled rate using VFD controlled duplex submersible pumps The SBR decant equalization tank is sized to accommodate high rate decant cycles and peak flows while limiting the forward flow through the plant to within the hydraulic capacity capabilities of the downstream treatment equipment.

The packaged effluent rapid sand filter (RSF) is located inside the main wastewater treatment plant building and consists of three cells of sand media and a clearwell located directly beneath the filter cells. Filter backwash is initiated automatically based on head loss through the filter media. A backwash cycle can also be manually initiated. The backwash flow goes to an exterior mudwell via a 12” gravity overflow and is then pumped back to the influent equalization basin.

Plant effluent is disinfected using ultraviolet radiation (UV). Effluent from the rapid sand filter flows by gravity from the RSF clearwell through a magnetic flow meter to a pit in the main treatment plant building that contains the UV unit. There is also a secondary UV unit that is piped in parallel to the primary unit and can be used as a backup if necessary. Additionally, a backup chemical disinfection system that uses sodium hypochlorite is also in place. The wastewater flows by gravity from the UV units to an in-ground concrete chlorine contact tank where chlorine can be added for disinfection in case the UV units are off-line. From the chlorine contact tank, the wastewater flows by gravity to a post aeration tank which has a volume of 11,400 gallons and is equipped with a fixed grid fine bubble aeration system. From the post aeration tank, the treated wastewater discharges via gravity to the receiving Sambo Creek.

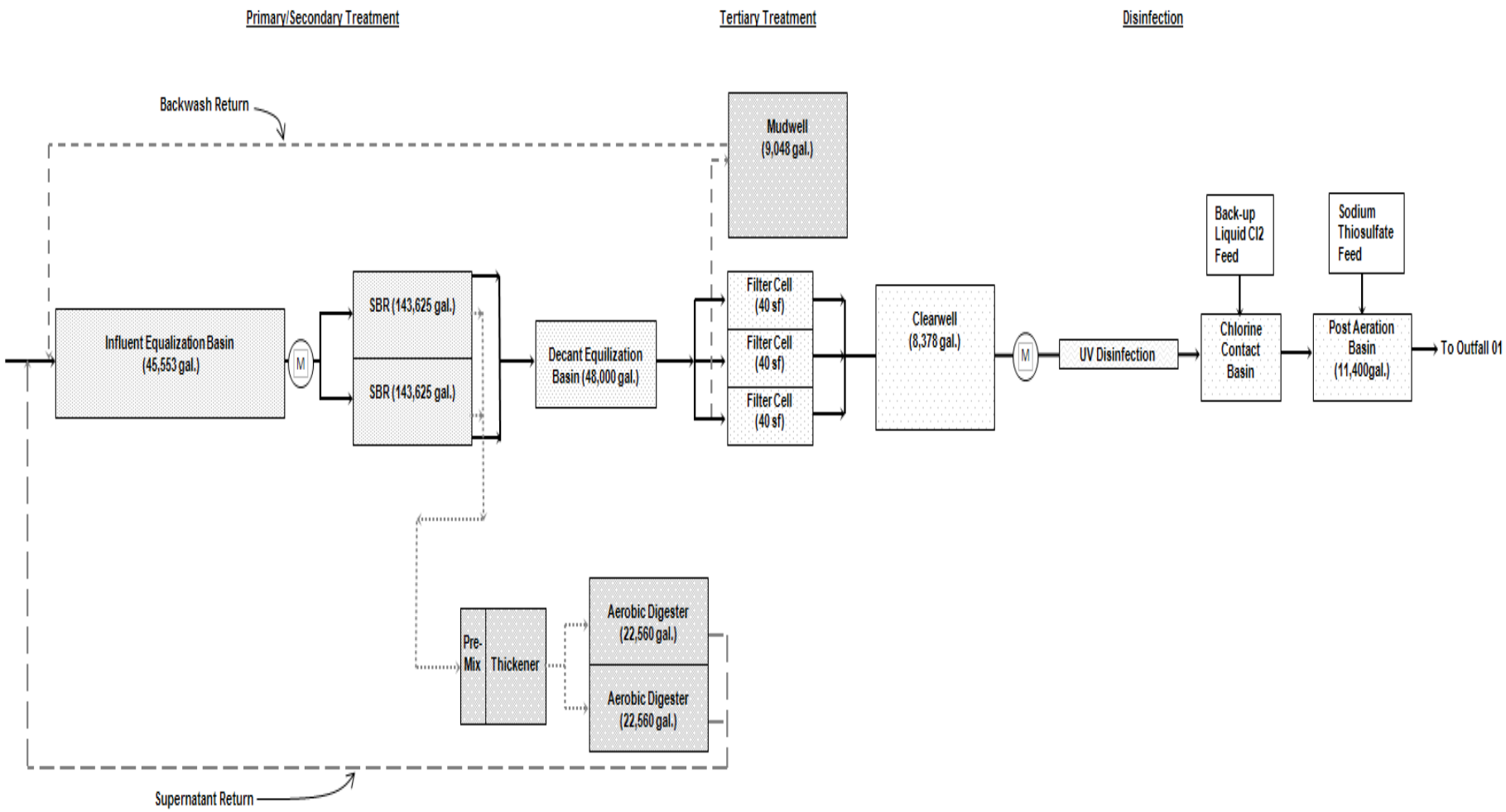
The sludge digestion system is a PAD-G process (Pre-thickened Aerobic Digestion with Gravity Thickener). The PAD-G is an aerobic digestion system with influent sludge pre-mix and gravity thickening and two aerobic digestion tanks. The design concept is that one digestion tank operates continuously in loop with the sludge thickener while the other batch aerobically digests the thickened sludge. Thickened sludge is removed from the digester on a periodic basis and hauled to PAWC's Lehman-Pike wastewater plant (Saw Creek) for further dewatering via belt press. Supernatant from the digester is decanted for return to the head-works of the plant.

The influent and effluent flow meters were last calibrated in April of 2021.

Certified Operators

The plant is operated by two DEP licensed operators holding current wastewater certifications in the Commonwealth; Dale Westover has obtained a Class A, E; Subclass 1,2,3,4 (#S9240) license, and Kasey White has obtained a Class A, E; Subclass 1,4 (#S9240) license.

Blue Mountain Lake Wastewater Treatment Plant Schematic



Pennsylvania-American Water Company
Blue Mountain Lake Wastewater Collection System Description

Overview

The Blue Mountain Lake Wastewater System serves customers in Stroud Township and Smithfield Township in Monroe County. The collection system terminates at the Blue Mountain Lake Wastewater Treatment Plant, which is currently operating under NPDES Permit Number 0062464.

The Blue Mountain Lake wastewater collection system consists entirely of low-pressure sewers serving approximately 875 customers in the Blue Mountain Lake Estates, Mountain View, Cornerstone Conservancy, and Mountain Hollow residential communities. The wastewater is conveyed through the system by semi-positive displacement grinder pumps that are owned and maintained by the individual customers, and six (6) centrally located PAWC owned/operated submersible pump lift stations. The complete system contains a total of approximately 68,252 linear feet of low-pressure sewer mains ranging in age from approximately 10 to 30 years. Most of the pipe installed is PVC with sizes ranging from 2-inch to 6-inch.

Wastewater from the customers within the Blue Mountain Lake Estates and Mountain View developments is discharged directly to the wastewater treatment plant through a single 6" low pressure force main. Wastewater from the customers within the Mountain Hollow and Cornerstone Conservancy Development discharges directly to the wastewater plant through a separate 6" low pressure force main.

Capacity/Condition

The sewer mains and lift stations are in good condition and are adequately sized to meet full system build-out. A three-person crew works in the sewer system by inspecting, cleaning and flushing any problem areas on a regular basis and systematically improving the system as needed. There is little to no infiltration and inflow (I&I) realized since the system is entirely low-pressure and relatively new and in good condition. Likewise, the system does not experience any I&I related operational issues (i.e. overflows, bypasses, or hydraulic overloading of the treatment works during storm events).

Lift Stations

PAWC owns and maintains six (6) submersible grinder type sewer lift stations located throughout the collection system. All of the lift stations are in good condition, and all have adequate pumping capacity to handle maximum current and projected flows (overload conditions are not projected during the 2-year projection period). The stations are cleaned and maintained by PAWC staff on a regular basis to ensure proper and efficient operation.

CLARION WASTEWATER OPERATION

COLLECTION SYSTEM

The collection system directly serves Clarion Borough and portions of the Clarion Township and Monroe Township. Bulk sewer service is provided to a portion of Strattanville Borough.

There are six duplex lift stations located in the collection system. The lift stations in the collection system operate in a cascading manor by pumping the sewage that flows by gravity from a low elevation and lifting it to a higher elevation and allowing it to flow by gravity again towards the treatment plant.

The lift stations are all duplex stations of various size and type as identified below. The stations in the collection system are float controlled and are locally operated with some no remote control functions and some having remote alarms. Operators perform daily inspections of the lift stations.

Lift Station	Type	Number of Pumps	Capacity per Pump (gpm)
Liberty St.	Suction Lift Duplex	2	1,275
CL School Rd.	Submersible Duplex	2	180
Stone House Rd.	Submersible Duplex	2	266
Mays	Suction Lift Duplex	2	240
Toby St.	Submersible Duplex	2	200
Hemlock Ridge	Submersible Duplex	2	150

WASTEWATER TREATMENT PLANT

The Clarion Wastewater Treatment Plant (WWTP) utilizes the contact stabilization activated sludge treatment process and has a permitted capacity of 2.90 MGD. This process uses activated sludge that is returned from the treatment system to provide the microorganism required to treat the incoming waste. The plant is required to report flow, CBOD, suspended solids, fecal coliform, pH, and total residual chlorine on a monthly basis for both monthly average and average weekly values. The plant discharges into the Clarion River, Clarion County.

A flow diversion vault is located at the influent end of the treatment plant. Flows in excess of 4.0 MGD during storm events are diverted to the 3.8 MG wet weather tank for storage. Once the influent flow subsides, the wastewater is pumped from the wet weather tank to the head of the plant for treatment. Typically, the influent flow enters the treatment plant through the headworks facility and through the fine screen. After screening the influent enters the grit removal portion of the treatment process. Grit removal consists of a vortex grit removal chamber that allows grit to settle out and be removed from the process and sent to a landfill for disposal.

Flow then exits the headworks facility and enters the influent metering flume and then on to the contact tank. This tank is aerated and also receives return activated sludge from the stabilization tank. The activated sludge provides the microorganisms required to assimilate the organic material

in the incoming sewage. The aeration provides the oxygen required for treatment as well as mixing the contents of the tanks.

After treatment in the contact tanks the waste flows into the clarifiers. The clarifiers are a quiescent area that allows the solids to settle from the wastewater. The clarified water is then withdrawn from the system and after disinfection is discharged to the receiving stream.

The return activated sludge from the clarifier is added to the stabilization tanks. A portion of the sludge is then returned to the contact tanks as returned activated sludge to allow the process to continue. The remainder of the activated sludge is wasted to the digestors. The digestors are aerated and serve to eliminate the volatile solids in the sludge; stabilizing the sludge prior to drying via the volute press. After treatment through the volute press the sludge is disposed of at a landfill.

Pennsylvania-American Water Company
Claysville Wastewater System

Collection System

Pennsylvania -American Water Company (PAWC) owns and operates a 0.16 MGD Wastewater Treatment Plant (WWTP), a lift station, and collection and conveyance sewers necessary to service Claysville Borough and portions of Donegal Township in Washington County. The system serves approximately 498 customer connections.

The collection system consists mainly of PVC pipe installed primarily in the 1980's. PAWC operates and maintains one lift station in the collection system located at the Welcome Center on Interstate 70. The lift station has two pumps and a backup generator.

Wastewater Treatment Plant

The Claysville Wastewater Treatment Plant (WWTP) utilizes Primary Sedimentation, Rotating Biological Contactors and Secondary Sedimentation. The facility is designed for rated capacities of 0.16 million gallons per day (mgd) and 325 lbs. BOD_5/day. The head works is equipped with an influent comminutor and a bypass manual bar rack. Effluent from the comminutor flows to a wet well, where it is pumped to an equalization tank.

Effluent from the equalization tank flows by gravity to two primary sedimentation tanks. The primary tanks contain a chain and flight sludge collection system. Sludge from the primary tanks is pumped into holding tanks where it is aerated and hauled away for further processing.

Effluent from the primary sedimentation tanks flows to two Rotating Biological Contactors (RBC). Both units are covered and operate in parallel. Poly-aluminum chloride is fed into the effluent of the RBC's for phosphorus removal. Effluent from the RBC's flows to the secondary flocculating clarifiers.

Influent to the secondary clarifiers enters the units in the middle of the tank and flow down through a circular baffle wall. The flow exits the units via the v-notch weirs and continues to the chlorine contact tank. Solids collected at the bottom of the tanks are pumped back to the raw water wet well.

Chlorine is fed at the chlorine contact tank as a disinfectant. The treated effluent flows from the chlorine contact tank through a flow measuring weir to the outfall. Sodium bisulfate is fed just before the outfall and is used to dechlorinate the final plant effluent water before it flows into the stream.

A generator is used for emergency power. The generator is sized to run the plant at design capacity.

The effluent flow meter was last calibrated in February 2021.

Pennsylvania American Water Company
Coatesville Wastewater Treatment Plant and Collection System Description

Pennsylvania American Water Company's wastewater treatment plant is located in South Coatesville Borough and discharges to the West Branch Brandywine Creek. The plant was originally constructed in 1932 and has been expanded and upgraded several times.

Wastewater is collected in a sanitary sewage collection system that is primarily gravity flow with several lift/pumping stations to assist with wastewater flow in the western portion of the system. Service is provided to customers in the City of Coatesville, the Borough of Parkesburg, East Fallowfield Township, Highland Township, West Caln Township, West Sadsbury Township, Sadsbury Township, and Valley Township. Bulk wastewater customers include Caln Township, West Brandywine Township, Veterans' Hospital and commercial septic haulers.

Coatesville Wastewater Treatment Plant

The treatment process is extended aeration process via an oxidation ditch process. The plant consists of headworks and influent pump station, biological treatment process including anaerobic and aerobic treatment units, three secondary clarifiers, a return activated sludge (RAS) pumping station, tertiary filtration units, disinfection system, and sludge handling facilities. Sludge is dewatered with a gravity belt thickener and centrifuges and the filter cake is disposed primarily by land application and a minimal amount at the landfill. It is currently operating under NPDES Permit Number PA0026859. This permit provides for a current effluent discharge rate of 7.0 MGD

Coatesville Wastewater Collection System

The collection system consists of ten (10) sewer basins. Older manholes are predominantly brick and mortar construction and newer ones are pre-cast concrete. Most of the older pipe is vitrified clay and the newer pipe installed has generally been PVC. PAWC, on an on-going basis, performs television inspection and a sewer line flushing/vacuum unit is used in a regular maintenance inspection program. Additionally, PAWC is working to reduce the infiltration and inflow (I&I) through an ongoing I&I reduction program

The collection system consists of 25 pump stations owned and maintained by PAWC. The Parkesburg pumping station is the largest and contains three sewage pumps having a combined design capacity of 4.5 mgd peak flow rating. Flow equalization facilities also exist at the Parkesburg Pump Station. In West Sadsbury Township, PAWC owns and maintains three (3) lift stations, one at the Quebecor facility and one at the West Sadsbury Commons shopping center, and one at Victory Brewing. Each of these stations contains duplex submersible pumps. Eight developments in East Fallowfield Township also have a total of eleven pump stations. There is one development in West Caln with a pump station and one pump station in the City of Coatesville. Sadsbury Township has one duplex submersible pump station. Valley Township has a total of seven pump stations.

Pennsylvania-American Water Company
Dravosburg Wastewater System

Collection System

Pennsylvania-American Water Company (PAWC)'s Dravosburg combined sewer system is located in Allegheny County and provides sanitary and combined sewage collection and treatment service as part of PAWC's McKeesport wastewater system. The collection and treatment system serves the Borough of Dravosburg. The collection system was installed in the 1900s or later. The system includes one lift station. Most of the manholes are brick. Most of the gravity collection mains are vitrified clay pipe.

Wastewater Treatment Plant

PAWC's Dravosburg STP is located in Allegheny County and provides sewage treatment service for the Borough of Dravosburg. The plant is permitted for 0.48 MGD and 1,668 lbs BOD_5/day. It employs an extended aeration activated sludge process for secondary treatment. Raw sewage enters Dravosburg STP through a comminutor for the grinding of solids before the flow enters the wet well. The sewage is pumped from the wet well to the plant's receiving trough by three (3) raw sewage pumps. The flow enters an aerated grit tank for the removal of heavy solids. The flow enters another trough where return activated sludge (RAS) is introduced into the sewage. The wastewater is treated in dual extended aeration tanks before continuing into dual final settling tanks in which sludge and floatable material are removed. Two (2) blowers supply air to the extended aeration tanks. The plant utilizes dual chlorine contact tanks for disinfection. The treated effluent is discharged to Monongahela River. An effluent flow meter was installed in 2010 to monitor the effluent of the STP.

In order to assist in maintenance, cleaning, repair or replacement of the various tanks and equipment, the STP has flow bypasses installed at various treatment processes. The combined sewer regulator can be bypassed at the combined sewer floodgate by direct flow to the CSO or using the trunk line for temporary storage. Maintenance is performed on the working parts of the regulator without creating a bypass condition. The raw sewage pumps can be individually bypassed by shutting valves on the intake, but at least one pump must always remain in operation during normal flow conditions. The grit tank has a trough around it, which can divert flow during maintenance periods. The extended aeration tanks can be shut off one at a time, but at least one tank must remain in operation. The final settling tanks and the chlorine contact tanks can also be removed from service for maintenance.

Sludge is removed from the final clarifiers and hauled to the PAWC McKeesport Wastewater Treatment Plant (WWTP) when lab tests and results show that the MLSS has increased. The solids are deposited directly into the digesters (#1 and #2). Then it is dewatered and hauled away for landfill disposal with other sludge from the McKeesport WWTP.

Effluent flow meter was last calibrated on May 18, 2021. The plant was neither hydraulically nor organically overloaded in 2020. The plant is not projected to be overloaded in the next five (5) years.

Pennsylvania-American Water Company
Duquesne Wastewater System

Collection System

Pennsylvania-American Water Company (PAWC)'s Duquesne combined sewer system is located in Allegheny County and provides sanitary and combined sewage collection and treatment service as part of PAWC's McKeesport wastewater system. The collection system serves the City of Duquesne and approximately 17 residential customers in West Mifflin Borough. There are no pumping stations or force mains in the Duquesne collection system. The collection system was installed in the 1900s or later. Most of the manholes are brick. Most of the gravity collection mains are vitrified clay pipe.

Wastewater Treatment Plant

PAWC's Duquesne STP is located in Allegheny County and provides sewage treatment service for the City of Duquesne. The plant is permitted for 2.0 MGD and 2,780 lbs BOD_5/day. It employs a contact stabilization activated sludge process for secondary treatment. Influent coming from two trunk sewers combine at a manhole within the treatment plant site and flows by gravity through the plant. The influent first flows through a manual Bar Rack to remove debris and then the Parshall Flume, which continuously records flow using an ultrasonic flow meter and seven-day chart recorder. A mechanically cleaned Screening Press (or during times of maintenance or repair, a manually cleaned bypass bar screen), follows. Sewage then enters an Aerated Grit Chamber for grit removal, utilizing a mechanical removal system. Airflow is generated by the process air blowers and is introduced into the chamber via an aerator with nine (9) diffusers which are located near the bottom of the chamber. Once the grit has settled, two (2) Air Lift Grit Pumps are used to remove the grit slurry and send it to a Dewatering Grit Screw for dewatering. Dewatered grit is collected and stored in a wheeled container for final disposal. A bypass line is provided to skip the Aerated Grit Chamber during times of maintenance or repair. Sewage then flows into two series Contact Tanks No. 1 & 2 via an open channel, where it is processed by activated stabilized sludge. Most of the colloidal, finely divided suspended solids, and dissolved organic matter get absorbed on the activated sludge in Contact Tanks. The mixed liquor is then divided into two (2) Final Clarifiers where activated sludge and heavy particles settle out. The treated sewage is then chlorinated as it proceeds to the Chlorine Contact Tank before final discharge into the Monongahela River near the mouth of Thompson Run. The entire treatment process may be bypassed to the chlorine contact tank, if necessary, during high flows. All diversions are manual and set for high flow conditions to prevent wash out of the treatment tanks.

A portion of the settled activated sludge to be recycled from the Final Clarifiers is drawn to a separate re-aeration in two (2) series Stabilization Tanks where the absorbed organic matter is oxidized to produce energy and new cells. It is then returned to No. 1 Contact Tank by gravity for mixing with the incoming Aerated Grit Chamber effluent. The excess sludge is discharged from Final Clarifiers and is then proceeded by two (2) Sludge Pumps to four (4) Aerobic Digesters, or skip the Aerobic Digesters to two (2) Gravity Thickeners. Thickener overflow is drained to the Building Sump where two (2) Building Sump Pumps transfer the overflow to influent channel prior to Contact Tanks for treatment. Thickened sludge is fed to the Belt Filter Press for dewatering via the two (2) Sludge Pumps mentioned earlier. A sludge transfer conveyor delivers the pressed

sludge to in a wheelbarrow and dumped into a dumpster for disposal. Pressed sludge and dewatered grit are then hauled away for landfill disposal. A Polymer Feeder adds polymer to thickened sludge improving its dewatering characteristics. Polymer and thickened sludge are mixed via a polymer mixing valve prior to the Belt Filter Press. The Belt Filter Press is washed using treated wastewater drawn from the Chlorine Contact Tank by two (2) Belt Wash Pumps. Filtrate and belt wash are collected in the Belt Filter Press Sump and then flow to influent channel prior to Contact Tanks for treatment.

Both Contact Tanks and Stabilization Tanks are equipped with fine bubble diffusers. Coarse bubble diffusers are installed at Aerobic Digesters. Three (3) centrifugal Process Air Blowers equipped with VFDs provide air to all the tanks installed with diffusers. The Process Air Blowers also provide airflow to Aerated Grit Chamber, and for Air Lift Grit Pumps and Return Sludge Air Lifts.

Two (2) vacuum-feed chlorinators are provided to feed chlorine, at a set rate, to each of a number of points in the treatment system. The chlorinators are manually paced based on measured total residual chlorine.

At the Duquesne STP, each component of the treatment plant has a bypass flow channel for use during maintenance and repair. PAWC's Duquesne STP is housed in the treatment plant building excluding influent Manual Bar Rack, Parshall Flume, and the Chlorine Contact Tank.

Effluent flow meter was last calibrated on April 16, 2021. The plant was neither hydraulically nor organically overloaded in 2020. The plant is not projected to be overloaded in the next five (5) years.

Pennsylvania American Water Company
Exeter Wastewater Treatment Plant and Collection System Description

The Exeter Township Wastewater Treatment Plant (WWTP) located at 400 Hanover Road, Birdsboro, Pennsylvania and was expanded to an annual average capacity of 5.9 MGD by the 1989 Act 537 Plan Update. The WWTP and sanitary collection system provide service to customers in Exeter Township, St. Lawrence Borough, and small portions of Alsace Township and Lower Alsace Township in Berks County, Pennsylvania. The customer base is a mix of residential, commercial, and industrial customers. In addition, the treatment plant treats septage and hauled in industrial waste from outside the Township.

Exeter Wastewater Treatment Plant

The Exeter Township WWTP operates under National Pollutant Discharge Elimination System (NPDES) Permit No. PA0026972. The WWTP consists of two separate treatment flow trains, the East WWTP and the West WWTP. The East WWTP consists of four Primary Clarifiers, two Aeration Tanks, two Final Clarifiers, and four Chlorine Contact Tanks. The East WWTP is used exclusively for the storage and treatment of high- strength municipal and industrial waste. The West WWTP consists of the Main Pumping Station, Headworks Building, four Primary Clarifiers, three 1st Stage Aeration Tanks, two 2nd Stage Aeration Tanks, four Final Clarifiers, and two Chlorine Contact Tanks.

Solids production and processing is handled in several phases. Raw sludge from the primary clarifiers is pumped directly to one of the two Primary Anaerobic Digesters. Waste Activated Sludge (WAS) from the system is gravity thickened before being pumped to one of the two primary Anaerobic Digesters. After digestion, the stabilized biosolids are transferred to a sludge holding tank and dewatered by one of two centrifuges. A sludge dryer provides drying of dewatered biosolids. Dried biosolids are disposed at a landfill.

Exeter Wastewater Collection System

The Exeter Township sewer collection system is divided into three main drainage basins, which convey sanitary waste to the wastewater treatment plant though the Antietam Creek, Heisters Creek and Schuylkill River Trunk Sewers. The collection system collects and conveys domestic and industrial wastewater to the Exeter Wastewater Treatment Plant.

The Antietam Creek Trunk Sewer begins within the Schuylkill River Trunk Sewer at the southern border of the Township and extends north through St. Lawrence Borough to manhole 400 near Butter Lane. The portion of the Antietam Trunk Sewer lies within St. Lawrence Borough. The Antietam Creek Trunk Sewer ranges in diameter from twelve inches at its upper reaches to twenty-seven inches at the connection point to the Schuylkill River Trunk Sewer.

The Schuylkill River Trunk Sewer begins at the Exeter Wastewater Treatment Plant and continues along the southern border of the Township and the Schuylkill River, then turning north along East Neversink Road ending at S.R. 422. The Schuylkill River Trunk Sewer is fifteen inches in diameter up to the connection point of the Antietam Creek Trunk Sewer where it changes to thirty inches in diameter up to the wastewater treatment plant.

The Heisters Creek Trunk Sewer begins at the Exeter Wastewater Treatment Plant and continues upstream along the Heisters Creek where it branches to the collection system. The Heisters Creek Trunk Sewer ranges in diameter from eight inches at its upper reaches to sixteen inches at the connection point to the Schuylkill River Trunk Sewer.

St. Lawrence Borough and parts of Lower Alsace and Alsace Townships are served by the Antietam Creek Trunk Sewer and the Exeter Township Wastewater Treatment Plant.

The PAWC operates and maintains six pump stations in the collection system.

Pumping Station	Location	Type	Rated Capacity (mgd)
Buddies Place	701 Sunset Manor Drive	Submersible	0.215
Glen Oley	Beecham Road and Gladwynn Drive	Submersible	0.346
Lincoln Road	1395 Lincoln Road	Suction Lift	0.933
Pineland Road	198 Pineland Road	Submersible	0.076
Pottstown Avenue	601 Red Lane Road	Submersible	0.217
South Baumstown Road	690 South Baumstown Road	Submersible	0.228

FAIRVIEW WASTEWATER OPERATION

COLLECTION SYSTEM

Pennsylvania-American Water Company (PAWC) owns and operates the wastewater collection, conveyance, and treatment facilities serving Fairview Township in the northern drainage area. The collection and conveyance facilities include approximately 31 miles of gravity sewer mains ranging in size from 8 to 21 inches in diameter and approximately 4 miles of force mains. There are 11 pump stations in the North WWTP sewer service area.

PAWC owns and operates the wastewater collection, conveyance, and treatment facilities serving Fairview Township in the southern drainage area. The collection and conveyance facilities include approximately 37 miles of sewer mains ranging from 8 to 16 inches in diameter and approximately 2.5 miles of force mains. There are six pump stations in the South WWTP sewer service area.

WASTEWATER TREATMENT PLANTS

The Fairview North Wastewater Treatment Plant (WWTP) is an extended aeration treatment plant located in the northeastern area of the Township and discharges to the Susquehanna River via a shared outfall with Lower Allen Township Authority. The WWTP has a hydraulic capacity of 1.206 mgd and an organic loading capacity of 1,740 lbs. BOD/day. Waste sludge generated at the North WWTP is transported in liquid form to the PAWC New Cumberland WWTP for dewatering.

The Fairview South Wastewater Treatment Plant is a Sequencing Batch Reactor (SBR) treatment plant located in the southern area of the Township and discharges to an unnamed tributary of Fishing Creek. The plant was originally constructed in 1993 and has a hydraulic design capacity of 0.94 mgd, and a maximum an organic loading of 1,700 lbs./day. Solids handling facilities are comprised of an aerobic digester/storage tank and belt press filtration.

Pennsylvania American Water Company
Foster West End Sewer System Description

Foster West End Sewer is in Foster Township, Luzern County, Pennsylvania. The system provides public sewer service to the western portion of Foster Township. The remaining public sewer customers in Foster Township are served by the Foster East End Sewer which remains owned by Foster Township.

Foster West End Collection System

The Foster Township's West End sewage facilities include gravity mains, four (4) pumping stations and associated force mains. Foster Township does not have its own treatment facility and consequently sends all its sewage from the Foster West End Sewer to the Freeland Municipal Authority wastewater treatment plant for treatment.

The system collects wastewater from approximately 575 customers. The collection system contains over 47,900 lineal feet of mainline sanitary sewers and four (4) pumping stations.

All four station contain submersible duplex pumps. The four pump stations are:

- Highland (100 gpm)
- Youngstown (320 gpm)
- Upper Lehigh (140 gpm)
- Woodside (800 gpm).

FRANKLIN WASTEWATER OPERATION (INCLUDING HAMILTONBAN)

COLLECTION SYSTEM

The collection system is a typical sanitary sewer system serves customers in both Franklin Township and Hamiltonban Township. The collection system consists of approximately 10 miles of PVC and VCP gravity main and approximately 2.5 miles of force main. The 6,500 feet of VPC gravity main was lined with UV CIPP in 2021.

WASTEWATER TREATMENT PLANT

The Franklin Wastewater Treatment Plant is a Sequencing Batch Reactor (SBR) system constructed in 2009 and has a design capacity of 0.200 mgd. The plant includes influent fine screening, biological treatment using SBR technology, chlorination, and dechlorination. Waste activated sludge is digested in the plant's aerobic digester. Digested sludge is hauled out for disposal by a private hauler. The plant influent passes through an influent mechanical fine screen. After this, flow is pumped into one SBR unit constructed in above ground concrete tanks. Waste sludge flows via gravity from the SBR tanks to aerated sludge digesters. The waste sludge is thickened via decanting to 1% to 2% solids. Aerated sludge is wasted on an as needed basis. A liquid chlorine system is used for disinfection of the plant effluent prior to discharge. An emergency diesel generator provides standby power and is capable of powering the treatment process. The plant is surrounded with a chain link fence and is accessible by a paved road.

KANE WASTEWATER OPERATION

COLLECTION SYSTEM

The collection system directly serves Kane Borough and portions of the Wetmore Township.

The collection system consists of two major drainage basins that each convey wastewater to their respective wastewater treatment plant and a total of eight lift stations. The Hubert Run drainage basin drains to the Kinzua Road WWTP and includes two lift stations and the West Run drainage basin drains to the Pine Street WWTP and includes six lift stations. The lift stations in the collection system operate in a cascading manor by pumping the sewage that flows by gravity from a low elevation and lifting it to a higher elevation and allowing it to flow by gravity again towards the treatment plant.

Lift Station	Maximum Pumping Capacity (gpm)
Pond St.	180
SR 321	80
Westwind	80
SR 66	80
Jo Jo Road	40
Zooks/Northwest	45
Northwest	80
West Kane	80

WASTEWATER TREATMENT PLANT

The Kinzua Road and Pine Street WWTPs are very similar plants that both employ biological and chemical treatment processes to attain an effluent quality which consistently meets NPDES permit requirements. The wastewater process facilities at the both plants consist of preliminary treatment works which includes a mechanically cleaned bar screen and a grit removal system, an activated sludge secondary treatment system (four tank sequencing batch reactor (SBR) activated sludge process), two chlorine contact tanks, sodium bisulfite dechlorination system and an effluent water tank. Treated effluent from the Pine Street WWTP is discharged to West Run and treated effluent from the Kinzua Road WWTP is discharged to Hubert Run.

KOPPEL WASTEWATER OPERATION

COLLECTION SYSTEM

The collection system serves Koppel Borough and a portion of Big Beaver Borough. The Koppel Borough collection system does not contain any lift stations. The collection system piping material consists mainly of vitrified clay with some PVC piping.

WASTEWATER TREATMENT PLANT

The Koppel Borough Sewer Treatment Plant is an ICEAS system SBR constructed in 2004 and has a permitted capacity of 0.240 mgd and the capacity to handle peak flows up to 0.900 mgd. The plant influent passes through an inline grinder prior to the treatment basins. The plant includes two SBR treatment basins. Treated sludge is pumped from the treatment basins to an aerated sludge digester. Sludge from the aerated digester is pumped through a progressive cavity pump to a sludge dewatering belt filter press. After the sludge has been dewatered, the cake is conveyed to a dumpster and hauled to a landfill. UV treatment is utilized for disinfection and the effluent from the SBR basins passes through the UV reactors prior to discharging to the Jamison Run Creek. An emergency generator provides standby power and is capable of powering the entire treatment facility.

Pennsylvania-American Water Company
Lehman-Pike Wastewater Treatment Plant Description

Overview

The Lehman-Pike wastewater treatment plant is a sequencing batch reactor (SBR) – suspended biological treatment facility with post-treatment chorine disinfection. The plant was originally constructed in 1976 with multiple expansion and improvement projects completed since.

The treatment facilities consists of one (1) 100,000 gallon aerated equalization tank, four (4) 100,000 gallon SBR tanks, two (2) 40,000 gallon aerated sludge digesters, one (1) 40,000 gallon aerated sludge holding tank, one (1) sludge dewatering belt press, and one (1) 40,000 gallon chlorine-contact/post-equalization tank. See the attached plant flow diagram for more information.

The plant has a permitted annual average flow capacity of 0.750 MGD as established by NPDES #PA-0060640 and DRBC Docket D-1988-089 CP-3; however the current hydraulic capacity of the plant is rated at 0.532 MGD. The WWTP is not in a current hydraulic or organic overload condition, nor is it projected to be within the next five years.

Process

Wastewater enters the plant through three mains (one 10-inch pressure main from Saw Creek Estates, one 4-inch pressure main from Winona Lakes Residential Development; and one 8-inch gravity main from Falling Creek Estates) into a receiving manhole and then flows via gravity through a 12-inch inlet line to a partial flume with an ultrasonic flow meter and an automatic sampler. The raw water then gravity feeds into the 100,000 gallon aerated equalization tank where it is then transferred to one of the four SBR process tanks by four variable speed controlled submersible pumps and an automatic valve splitter box. A 25% caustic soda (sodium hydroxide) solution is fed into the equalization tank in order to stabilize the raw wastewater pH.

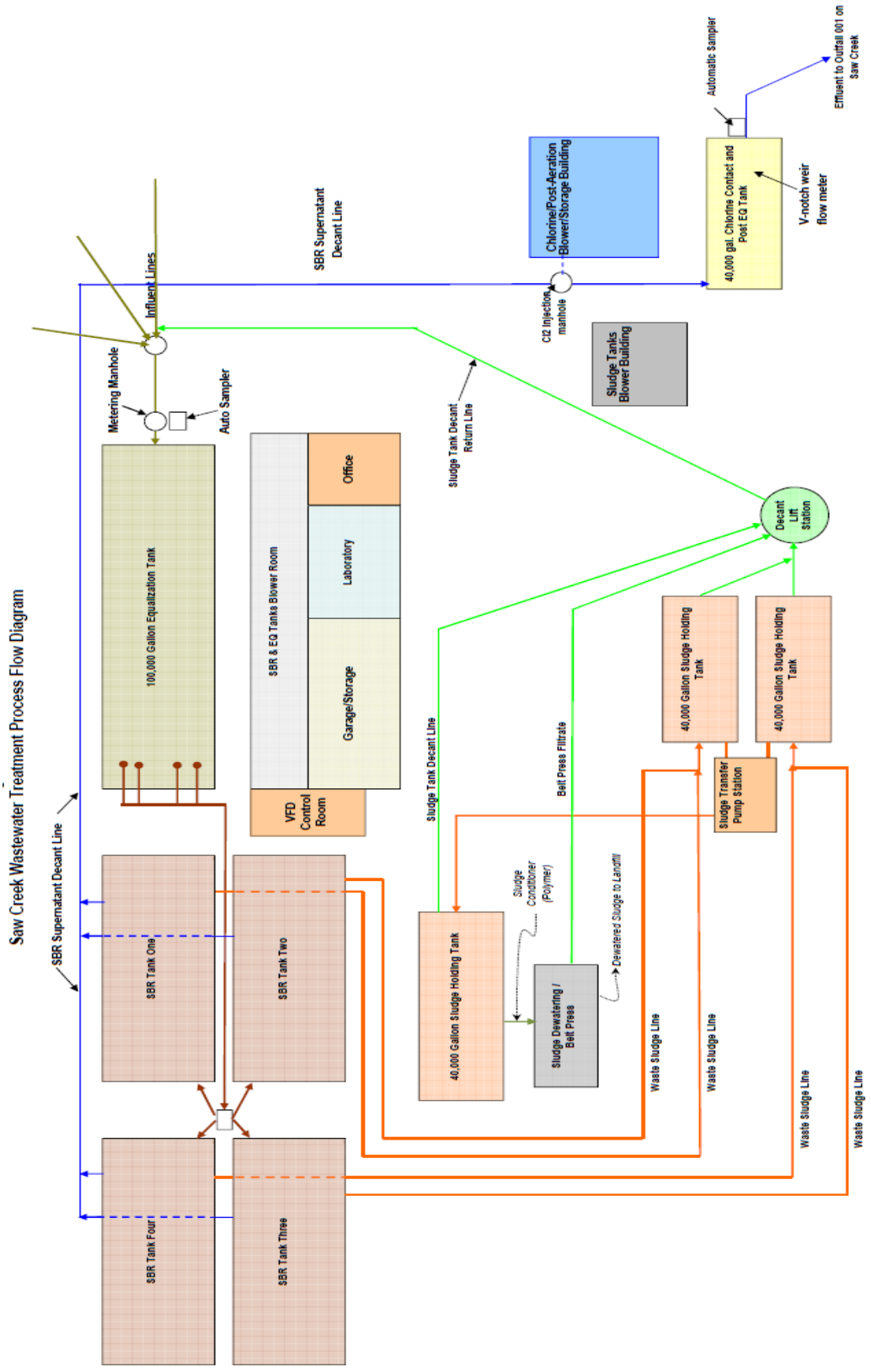
Within the SBRs, aeration of the entire fill cycle is routinely performed in order to promote the growth of microorganisms, to remove ammonia and nitrogen compounds and to promote the breakdown of organic matter. After the fill/aeration cycle is complete in each unit, a settling and reactive stage occurs to gravity settle any remaining solids. After the settling period, the supernatant is decanted off the top of the tanks to the chlorine-contact/post-equalization tank by two floating decant pumps. Just prior to the contact/post-EQ tank a liquid sodium hypochlorite solution is fed into the decant line for disinfection. The flow then enters the serpentine-baffled post-equalization tank where adequate chlorine contact time is achieved. The flow then enters an aerated dechlorination zone within the tank where a liquid sodium-bisulfite solution is fed in order to keep the final effluent's chlorine residual beneath the plant's NPDES permit limit. The flow then travels through a v-notch weir with ultrasonic flow meter to measure effluent flow, then an effluent automatic sampler, and is then discharged to the receiving Saw Creek.

The thickened solids are removed from the bottom of each of the four SBR tanks by submersible sludge pumps (two in each tank) and conveyed to one of two sludge digester tanks for further thickening. The supernatant from the two digester tanks is gravity fed to an adjacent lift station where it is returned to the headworks of the plant. The sludge from the two digester tanks is then transferred by submersible pumps to the upper sludge holding tank prior to being dewatered by the belt filter press. Polymer conditioning of the solids is done prior to the press to enhance its dewatering capabilities. Water released during the sludge pressing operation is returned to the head of the plant and reprocessed. The dewatered material from the filter press is hauled off-site to an approved disposal facility. Supernatant from the upper sludge holding tank is also decanted, via a telescoping valve, to the lift station for return to the plant headworks. Sludge is also hauled to the plant from PAWC's nearby Blue Mountain Lake and Marcel Lake wastewater plants for further dewatering by the belt filter press at the Lehman-Pike plant.

The influent and effluent flow meters were last calibrated in April of 2021.

Certified Operators

The plant is operated by two DEP licensed operators holding current wastewater certifications in the Commonwealth; Mark Lambert has obtained a Class A, E; Subclass 1,4 (#S9240) license, and Kasey White has obtained a Class A, E; Subclass 1,4 (#S9240) license.


Saw Creek Wastewater Treatment Process Flow Diagram
SBR Supernatant Decant Line
Influent Lines
Metering Manhole
Auto Sampler
100,000 Gallon Equalization Tank
SBR Tank One
SBR Tank Two
SBR Tank Four
SBR Tank Three
SBR & EQ Tanks Blower Room
Office
Laboratory
Garage/Storage
VFD Control Room
SBR Supernatant Decant Line
Sludge Tank Decant Return Line
Cl2 Injection manhole
Chlorine/Post-Aeration Blower/Storage Building
Sludge Tanks Blower Building
Automatic Sampler
40,000 gal. Chlorine Contact and Post EQ Tank
V-notch weir flow meter
Effluent to Outfall 001 on Saw Creek
Decant Lift Station
Sludge Tank Decant Line
Belt Press Filtrate
40,000 Gallon Sludge Holding Tank
40,000 Gallon Sludge Holding Tank
Sludge Transfer Pump Station
40,000 Gallon Sludge Holding Tank
Sludge Conditioner (Polymer)
Sludge Dewatering / Belt Press
Dewatered Sludge to Landfill
Waste Sludge Line
Waste Sludge Line
Waste Sludge Line
Waste Sludge Line

Pennsylvania-American Water Company
Lehman-Pike Wastewater Collection System Description

Overview

The Lehman-Pike collection system currently provides service to approximately 2,675 full and part-time customers in various residential developments and campgrounds throughout Lehman and Middle Smithfield Townships in Pike and Monroe Counties. Much of the service area is made up of highly seasonal customers, nearly all of which are residential accounts (there are only approximately 13 commercial accounts).

The collection system is made up entirely of low-pressure sewer main with approximately 268,455 linear feet of main with 13 centralized lift stations. Each customer owns and maintains their own E-One® semi-positive displacement grinder pump system. Timothy Lake Campgrounds maintain and operate their own gravity sewage collection lines and lift stations, although there is an aerated equalization basin (2 tanks piped in parallel) at the Timothy Lake North Campground site which is owned and operated by PAWC. This tank system equalizes the flow from the campground and pumps it, at a paced scale, into the PAWC owned Lehman-Pike collection system via variable speed duplex submersible pumps.

Within the collection system, sewage from the low-pressure system is discharged into a series of lift stations and then conveyed to the Lehman-Pike wastewater treatment plant. The approximate 268,455 LF of sewer mains range in age from about 2 to 40 years old (with most of the system being in the 20-30 year old range); and sizes range from 1.25-inch in cul-de-sacs to the 10-inch force main entering the plant. The majority of the pipe is SDR-26, SDR-21 and SDR-18 PVC. There are no manholes, only various sized clean-outs and valves located at regular intervals along the force mains.

Capacity/Condition

The sewer mains are in good condition and are adequately sized to meet full system build-out. PAWC maintains a regular program of monitoring collection system conditions. A three-person crew works in the sewer system by inspecting, cleaning and flushing any problem areas on a regular basis and systematically improving the system as needed. There is little to no infiltration and inflow (I&I) realized since the PAWC owned system is entirely low-pressure and relatively new and in good condition. Likewise, the system does not experience any I&I related operational issues (i.e. overflows, bypasses, or hydraulic overloading of the treatment works during storm events).

Lift Stations

PAWC also owns and maintains thirteen (13) sewer lift stations throughout the collection system (not including the Timothy Lake equalization system). Seven (7) of these stations are similarly designed Smith and Loveless above-grade vacuum primed lift stations. The remaining six (6) are duplex submersible-pump style stations with either grinder or non-clog submersible pumps. All of the lift stations are in good condition with stand-by/emergency power capability. The stations are cleaned and maintained by PAWC staff on a regular basis to ensure proper and efficient operation, and all have adequate pumping capacity to handle maximum current and projected flows.

Pennsylvania American Water Company
Marcel Lakes Wastewater Treatment Plant and Collection System Description

The Marcel Lakes wastewater system is located in the Marcel Lakes Estates Community in Delaware Township, Pike County. The system currently serves customers in the Marcel Lake Estates community. The WWTP was acquired by PAWC from the previous owner, the Clean Treatment Sewage Company (CTSC) in 2013 following the completion of a Public Utilities Commission Acquisition Investigation.

Marcel Lakes Wastewater Treatment Plant

The Marcel Lake Estates Wastewater Treatment Plant was upgraded from an extended aeration system to a SBR treatment process in 1994. The treatment facility has a permitted design capacity to treat 0.100 mgd of sewage during low groundwater periods (dry weather) and the capacity to treat up to 0.200 mgd during high groundwater periods (wet weather). The effluent limitations on the plant's NPDES permit are based on an effluent discharge rate of 0.200 mgd. The facility is permitted under NPDES Permit No. PA0060313 and Delaware River Basin Commission Docket No. D-90-28 for discharge to Dingmans Creek in Delaware Township, Pike County.

The plant influent passes through an inline grinder prior to the three main sewage pumps. The main sewage pumps discharge to a splitter box that evenly distributes the flow between two treatment basins that function as an integral unit. The effluent decanted from the treatment basins flows by gravity to a circular clarifier. Sludge from the treatment basins and the circular clarifier is pumped to two aerated sludge holding tanks. Supernatant from the aerated sludge holding tanks is pumped to the head of the plant and the wet sludge is hauled away for disposal. Effluent from the final clarifier is disinfected with ultraviolet light prior to discharging to Dingmans Creek. A 100 kW emergency generator provides standby power and is capable of powering the entire treatment plant. The plant is surrounded with a chain link fence and is located adjacent to Dingmans Creek.

Marcel Lakes Wastewater Collection System

The collection system is comprised of two sections. The western section is a low-pressure collection system and the eastern section is a gravity collection system which was replaced and completed in the first quarter of 2018. The new gravity collection system comprised of approximately 30,732 LF of sewer main, 2 sewage pump stations, and 2,500 LF of force main, and 130 manholes. The low pressure and gravity collection system combine for a total of 59,328 feet of collection mains. Customers served by the low-pressure system have individual grinder pumps, which are owned and maintained by the homeowner. The gravity collection system consists of 30,732 feet of main (52%), and 28,597 feet of low-pressure force main (48%).

MCEWENSVILLE WASTEWATER OPERATION

COLLECTION SYSTEM

The collection system was constructed in 1984 and contains approximately 2.5 miles of 8-inch PVC gravity pipe and approximately 0.25 miles of force mains. The McEwensville collection system contains four lift stations.

WASTEWATER TREATMENT PLANT

The McEwensville wastewater treatment facility is a lagoon-type system with a design capacity of 0.045 mgd. There are two aerated lagoons, containing two cells each, separated by baffles. The wastewater collection system conveys wastewater to a wet well located at the head of the plant. The wastewater is then pumped into the first lagoon and flows sequentially into cells 2, 3, and 4. Each lagoon is approximately 110,000 gallons. Lagoon No.2 also contains eight (8) floating, attached-growth Bioreactors and a plate settler for tertiary treatment prior to the Chlorine Contact Tank.

Pennsylvania-American Water Company
McKeesport Wastewater System

Collection System

Pennsylvania-American Water Company (PAWC)'s McKeesport combined sewer system is located in Allegheny County and provides wastewater and combined sewage collection and treatment service to approximately 10,561 residential, commercial, and institutional customers in the City of McKeesport, the City of Duquesne, the Borough of Dravosburg, and the Borough of Port Vue. The City of Duquesne and the Borough of Dravosburg are served by separate wastewater treatment plants which are described elsewhere. The collection system does not directly serve any industrial customers. The McKeesport collection system and McKeesport WWTP also serve customers in eight surrounding municipalities through inter-municipal agreements, which include the Boroughs of White Oak, East McKeesport, Lincoln, Liberty, Versailles, and Glassport, and the Townships of North Versailles and Elizabeth.

The collection system was installed in the 1900s or later. The interceptor lines were installed in the 1950s or early 1960s to intercept flow that was going into the river and direct flow to the WWTP. The McKeesport collection system includes nine (9) lift stations. Most of the manholes are brick. Most of the gravity collection mains are vitrified clay pipe. Force main materials include cast iron and PVC. The system is permitted for 30 combined sewer overflow outfalls.

Wastewater Treatment Plant

PAWC's McKeesport Wastewater Treatment Plant (WWTP) is located in the City of McKeesport in Allegheny County, Pennsylvania. The McKeesport WWTP provides secondary treatment consisting of conventional activated sludge (CAS) and sequencing batch reactors (SBR) and is permitted for 13 MGD (dry weather) and 19,950 lbs BOD_5/day. The McKeesport WWTP has a wet weather capacity of 56 MGD.

At the junction manhole where the Upper and Lower Monongahela Interceptors meet, a sluice gate controls the flow of wastewater into the treatment plant. The gate can be regulated manually through the use of a power unit and gear reduction. The flow then enters the plant pump station and is pumped to the head works building by four (4) variable speed pumps (3 duty 1 standby). The head works building accepts flow from the plant pump station and also from the West Shore Pump Station. Both flows are combined prior to the two (2) Mechanically Cleaned Fine Screens. Sewage then enters two (2) parallel Pista Grit Systems. Flow circulates and deposits the grit in the center hopper of Pista Grit Systems. The system then pumps the grit to a grit washer and through a conveyer to a dumpster for landfill. A manually cleaned Bar Screen provides a bypass during maintenance or repair of Mechanically Cleaned Fine Screens. Pista Grit Systems effluent is divided at the Splitter Box into four (4) rectangular SBR Tanks and four (4) parallel rectangular CAS reactors (# 1, # 2, # 5, and # 6 tanks). The two biological processes run parallel at the plant.

Under normal conditions, the flow is distributed evenly between the two processes. However, the distribution ratio is adjusted for wet weather or when needed.

The SBR system involves the fill aeration sequence followed by the sludge settling sequence. Sewage is added over a short period of time. Aeration is continued for a selected period of time followed by a quiescent settling phase and decantation of the treated sewage. The SBR system operates on timed cycles – fill, react, settle, decant, and idle. SBR effluent runs through 3 channels of Ultra Violet light. Each channel has 3 banks of Ultra Violet Light. The amount of Ultra Violet Light on at one time is controlled through the plant SCADA system and is flow proportionate. The disinfected wastewater out of UV system combines with the treated wastewater from CAS Tanks that is disinfected at Chlorine Contact Tanks at the Effluent Flume before discharging to Monongahela River. Waste Activated Sludge (WAS) of SBR system flows to # 1 and # 2 Aerobic Digesters for digesting and further handling.

The four (4) CAS Reactors run parallel. The mixed liquor continuously overflows the aeration tank weirs and flows in two (2) circular Final Clarifiers where the solids portion settles to the bottom. The supernatant overflows the Final Clarifier weirs and flows to chlorination at the Chlorine Contact Tank. The Chlorine Contact Tank is built in two (2) separate sections. The treated wastewater combines the UV system effluent and then is discharged to the Monongahela River.

The solids concentrate on the bottom of the Final Clarifiers and are conveyed to the RAS/WAS Wet Well, which is constructed integral with the Blower Building basement. Return Activated Sludge (RAS) is cycled back to the four (4) CAS Aeration Tanks by three (3) horizontal, centrifugal, non-clog return sludge pumps equipped with VFDs. RAS volumes and flow rates can be automatically proportioned based on the influent flow rate. WAS is pumped to the two (2) Aerobic Digesters (#1 and #2) by four (4) WAS Pumps.

When the two (2) Aerobic Digesters (#1 and #2) storing WAS of both SBR and CAS reactors are full, the sludge is then pumped to the other four (4) Aerobic Digesters (#3 to #6) by two (2) sludge pumps. After digestion, the sludge is dewatered through one of the plant's two dewatering means: a Filter Belt Press and a Rotary Press. The dewatered sludge is sent to a landfill.

Fine bubble diffusers are installed at both SBR and CAS reactors. Four (4) CAS tanks, two (2) of which are utilized as Aerobic Digesters, are turbine aerators. Five (5) SBR Blowers provide air to SBR Tanks. Three (3) CAS Process Air Blowers provide air for the four (4) aeration tanks. Four (4) Digester Blowers provide air to all of the six (6) Aerobic Digesters.

In addition, two (2) channel air blowers are provided to supply air to the mixed liquor troughs and channels. This air provides agitation to keep solids in suspension as the mixed liquor flows toward the Final Clarifiers. The channel aeration system also supplies air to the RAS wet well to prevent settlement and to help keep the sludge fresh.

Two (2) vacuum-feed chlorinators are provided to feed chlorine, at a set rate, to each of a number of points in the treatment system. The chlorinators are manually paced based on measured total residual chlorine.

Two (2) CAS Tanks (#3 and #7) are used as sewage holding tanks during high influent flows. The sewage is slowly drained back to head of the plant when influent flow subsides.

Effluent flow meter was last calibrated on April 16, 2021. In 2020, the plant was neither hydraulically nor organically overloaded. The plant is not projected to be overloaded in the next five (5) years.

NEW CUMBERLAND WASTEWATER OPERATION

COLLECTION SYSTEM

The collection system is a typical sanitary sewer system with approximately 27 miles of gravity pipe ranging from 6 to 21-inch diameter and approximately 1.3 miles of force main. The majority of the system was constructed in the 1950's with terra cotta mains and brick manholes. The New Cumberland wastewater collection system contains three lift stations.

The collection system is divided into four sub-drainage areas. A small area drains to the Drexel Hills lift station, a larger area drains to the Cedar Cliff lift station, an area that flows by gravity directly to the treatment facility and a large area that drains to the Southeast lift station.

There are three lift stations located in the collection system. With the exception of the Southeast lift station, they operate in a cascading manner by pumping the sewage that flows by gravity from a low elevation and lifting it to a higher elevation and allowing it to flow by gravity again to the wastewater treatment facility. The Southeast station pumps sewage directly to the wastewater treatment facility.

WASTEWATER TREATMENT PLANTS

The New Cumberland Wastewater Treatment Plant was originally constructed in the 1950's and has a hydraulic design capacity 1.25 mgd. The plant has nitrogen and phosphorus load limits of 22,831 pounds and 3,044 pounds per year respectively.

Sewage enters the new headworks building where the influent passes through a screening unit equipped with a washer and compactor. After exiting the screen, the wastewater enters a vortex grit chamber where it then flows to the anaerobic tank. The influent enters into the second of the tanks, where it mixes with return activated sludge from the first tank. The tanks are designed to promote the growth of phosphorus absorbing bacteria within the wastewater prior to entering the oxidation ditch.

The main component of the treatment plant is the oxidation ditch. The ditch has two trains, each with a volume of 0.52 mg. The influent passes through an influent distributor that directs the flow to one of the two trains. Here a submerged mixer directs the flow around the oval shaped track. Through a series of sensors and software, the oxidation ditch provides the required mixing and air to maximize efficiency. An automated sampling station located in the middle of the ditches monitors nitrate and ammonia levels to optimize the cycle times within the system. The treated effluent exits the system by flowing over a motorized effluent weir and into a secondary anoxic zone. A third tank follows the secondary anoxic zone. This tank is equipped with a header and coarse bubble diffusers. This process promotes the removal of nitrogen gas and deters the release of phosphorus in the final clarifiers. The effluent flows by gravity into one of two circular clarifiers. Waste activated sludge (WAS) is transferred from the secondary clarifiers to the aerobic digester. The clarifier effluent flows through two banks of UV lights for disinfection. Solids are dewatered onsite with a centrifuge.

Pennsylvania-American Water Company
Pocono Wastewater Treatment Plant Description

Overview

Pennsylvania American Water Company's Pocono Wastewater Treatment Plant is located in Coolbaugh Township, Monroe County within the Pocono Country Place residential development. The plant was originally constructed in 1980 and was expanded and upgraded by PAWC in the mid 1990s, along with some additional upgrades and improvements since. The treatment process is a sequencing batch reactor (SBR) – suspended biological treatment facility with post treatment UV disinfection. The plant consists of an influent screening and pumping facility, three (3) 690,000 gallon SBR tanks, one (1) post treatment re-aeration tank, one (1) 200,000 gallon aerated sludge-holding tank, and one (1) sludge dewatering belt-press. See the attached plant flow diagram for more information.

The plant's effluent limitations are established by NPDES permit #0060097 and DRBC Docket D-1999-029 CP-3 which are based on an annual average daily flow rate of 1.256 MGD. The WWTP is not in a current hydraulic or organic overload condition, nor is it projected to be within the next five years.

Process

Wastewater enters the plant through one 24-inch force-main and one 15-inch gravity main, then travels through an automatic bar screen and into the receiving wet-well where it is pumped by four (4) submersible pumps into one of the three (3) SBR units. A 60% sodium hydroxide solution is fed into the influent wet-well to stabilize the raw wastewater pH as needed.

Wastewater entering the SBRs is subjected to timed cycles of aerobic, anaerobic, and/or anoxic conditions along with various mixing stages. First, aeration of the entire fill cycle is routinely performed in order to promote the growth of microorganisms and initiate oxidation of organic carbon and nitrogen based material. After the fill/aeration cycle is complete, the blowers are turned off, but the mixers left on, and the concentration of dissolved oxygen is allowed to decrease. This anaerobic and/or anoxic mix stage further promotes the reduction of various organic and inorganic materials, including total nitrogen. After the bulk of the biodegradable matter is reacted, the mixers are turned off and a quiescent settling phase occurs. This settling period allows the solid material to migrate to the bottom of the SBR units while the upper clarified portions are decanted. Aluminum sulfate is added at times to enhance the settleability of the remaining solids, and to provide increased reduction of phosphorus. After the settling period, the supernatant is decanted off the top of the tanks and passed through an effluent flow meter and then a UV system for disinfection. The flow then enters the post-aeration tank and is then discharged to the receiving Dresser Run stream.

The thickened solids are removed from the bottom of each of the three SBR tanks by submersible sludge pumps (one in each tank) and conveyed to the aerated sludge holding tank prior to being dewatered by the belt filter press. Polymer conditioning of the solids is done prior to the press to enhance its dewatering capabilities. Water released during the sludge pressing operation is returned to the head of the plant and reprocessed. The dewatered material from the filter press is hauled off-site to an approved disposal facility. Portions of this activated sludge

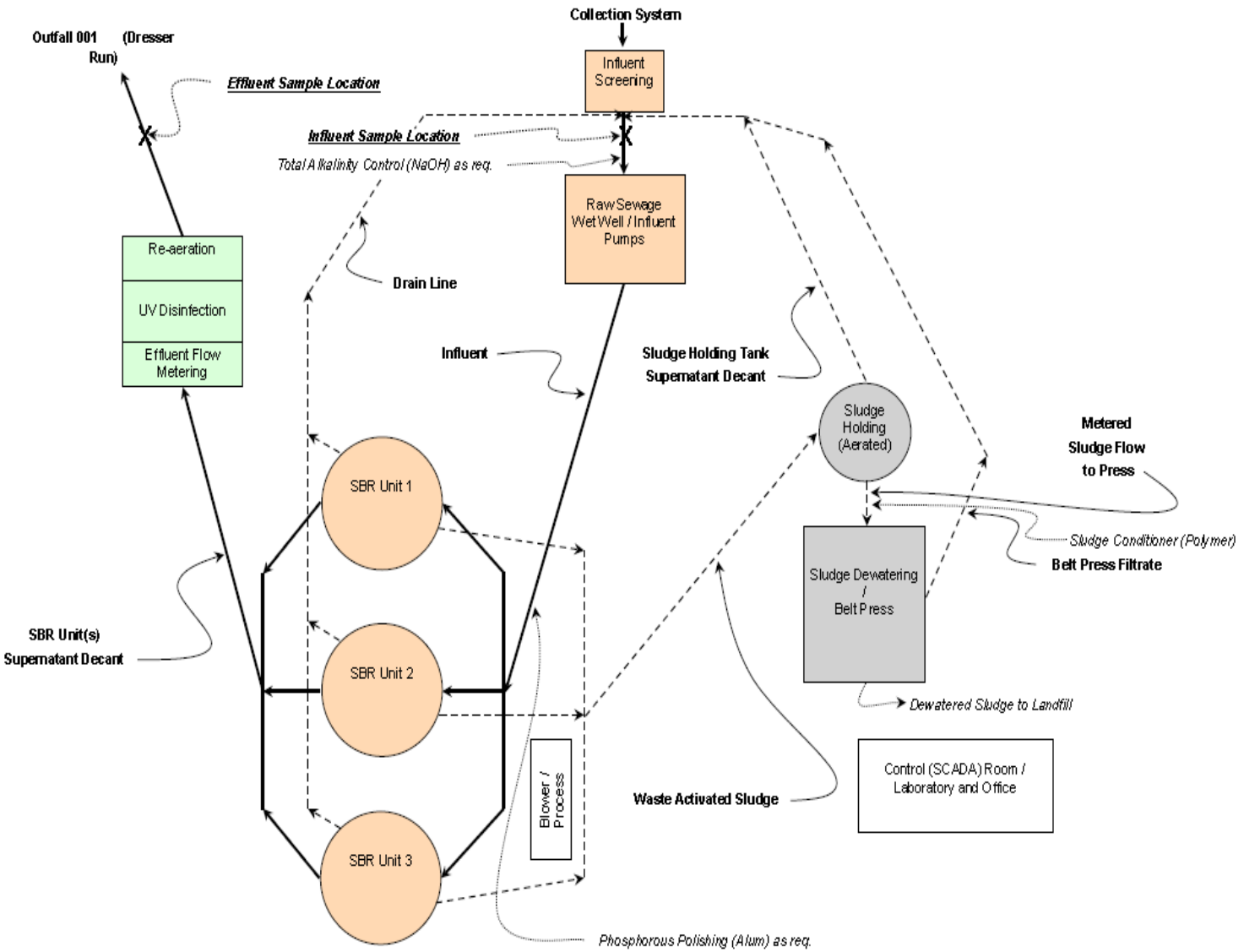
from the SBRs can also be returned to the head-works to assist in treatment when needed. Supernatant from the sludge holding tank is gravity decanted for return to the head-works of the plant.

The effluent flow meter was last calibrated in May 2021.

Certified Operators

The plant is operated by a DEP licensed operator holding current wastewater certifications in the Commonwealth; Joe Murphy has obtained a Class A, E; Subclass 1,2,3,4 (#T2388) license.

PAW - Pocono Country Place WWTP Schematic



Pennsylvania-American Water Company
Pocono Wastewater Collection System Description

The collection system is committed to serve a total 5,025 lots within the Pocono Country Place (PCP) development of which approximately 3,750 are currently developed and connected to the system. The collection system consists of a total of 250,448 feet of sewer main, divided by a northern portion (Area 5) and southern portions (Areas 1, 2A, 2B, 3 and 4) which include a total of approximately 150,649 linear feet of mainline gravity sewer (60%) and 99,798 linear feet of low pressure lines (40%), and two (2) lift stations. Most of the low-pressure lines (about 88,000 feet) are located in the northern part of the system in Area 5, with the remaining lines located in Area 4. There are approximately 777 manholes located throughout the gravity collection system; and each customer within the low-pressure portions of the system owns and maintains their own sewage grinder pump system which are of various make, model and age.

Sewage from the collection system is discharged into the two lift stations and then conveyed to the wastewater treatment plant or conveyed directly to the plant from the collection system. The sewer mains range in age from a few years to roughly 40 years old (with the majority being in the 35-45 year old time frame), and sizes range from 1-inch to 8-inch in the low pressure portions of the system and 8-inch to 24-inch in the gravity portions of the system. The majority of the pipe is PVC (SDR-26) and ABS truss type. The manholes are located in the gravity portions of the system and are concrete.

The sewer mains are adequately sized to meet current and projected flows and are in good to fair condition. PAWC maintains a regular program of monitoring collection system conditions. A three-person crew works in the sewer system by inspecting, cleaning and flushing any problem areas on a regular basis and systematically improving the system as needed. The system does experience moderate inflow and infiltration (I&I), mainly due to a combination of high groundwater, aging residential grinder-pump systems (which, in many cases, are not properly maintained by the home-owners), illegal connections (downspouts, sump-pumps, etc.), and failures in the collection system (leaking manholes, pipe joints, etc.).

Pennsylvania American Water Company
Royersford Wastewater Treatment Plant and Collection System Description

The Royersford wastewater system is located within the water footprint of PAWC's Royersford system in Montgomery County, Pennsylvania and serves customers within Royersford Borough as well as a small portion of Limerick Township (serving approximately 100 customer accounts) and approximately 16 customer accounts in Upper Providence Township directly connected to the Royersford system.

Royersford Wastewater Treatment Plant

Royersford discharges under NPDES Permit PA0021512. The Royersford Wastewater Treatment Plant (WWTP) is located at 600 South First Avenue in Upper Providence Township. Most of the plant's incoming sewage flows by gravity through a 15" diameter pipe located on First Avenue to the main pumping station. That sewage is pumped to the upper influent chamber and mixes with the remaining incoming sewage from north of the railroad tracks via Arch Street which flows to this upper influent chamber via a 12" gravity interceptor. All influent is screened at the upper influent chamber.

The WWTP permitted annual average flow is 0.70 MGD with a hydraulic capacity of 1.0MGD and an organic capacity of 1,751 pounds per day (ppd). The treatment process consists of raw sewage screening, pumping, primary settling, biological primary and secondary trickling filters, final settling, chlorination and de-chlorination. Treated effluent is discharged to the Schuylkill River. Primary and secondary (trickling filter) sludge is digested in a 45,000-gallon anaerobic digester. Two Imhoff tanks function as sludge holding tanks. Excess sludge is hauled in liquid form to other facilities for additional processing and disposal.

Royersford Wastewater Collection System

The Royersford collection system collects sanitary sewage throughout the Borough and conveys it to the Borough's wastewater treatment plant (WWTP). The Royersford sanitary sewer system was originally constructed in 1935 and extended in 1936 and consists primarily of 8-inch clay pipe. Newer sanitary sewers have been constructed using 8-inch PVC pipe. The main trunk sewers consist of 15-inch clay pipe. Manholes throughout the collection system are constructed of brick and newer manholes are precast concrete with brick riser sections. There are two (2) sewage pumping stations in the system that convey sewage from low-lying areas of the Borough to gravity sewers and on to the WWTP (the 10th Avenue Station and the Green Street Station).

Pennsylvania-American Water Company
Scranton Wastewater Treatment Plant Description

Overview

Pennsylvania American Water Company's (PAWC) Scranton Wastewater Treatment Plant (WWTP) is located in southern Scranton City and discharges treated effluent to the Lackawanna River under National Pollutant Discharge Elimination System (NPDES) Permit No. PA0026492A-2. The WWTP was originally constructed in 1972 and has undergone multiple expansion and improvement projects since then. The WWTP currently has an annual average design hydraulic capacity of 20.0 million gallons per day (MGD) and an annual average design organic loading capacity of 44,550 lbs. BOD5/day. The WWTP is not in a current hydraulic or organic overload condition, nor is it projected to be within the next five years.

The WWTP includes the following treatment processes:

- Screening and Grit Removal;
- Primary Settling;
- Activated Sludge Process/Biological Nutrient (Nitrogen & Phosphorous) Removal;
- Secondary Settling;
- Chlorine Disinfection; and
- Sulfur Dioxide Dechlorination.

See the attached Figure ES.1 - Plant Flow Diagram for more information.

Process

Wastewater enters the plant through a 78-inch diameter gravity trunk line, thru an ISCO open channel LaserFlow meter, and into the headworks of the treatment plant. The headworks facility contains two (2) 0.75-inch automatic coarse bar screens with traveling cleaner, two (2) 0.25-inch automatic fine screens with traveling cleaner, followed by grit removal through two (2) 53,850-gallon flow through grit chambers. Both sets of screens are continuous rake type screens that removes rags and other debris from the influent waste stream, and are also fitted with washers/compactors which solidify the waste material for ease of handling and disposal. Grit and other inorganic material is removed in the flow through grit chambers with collection scrappers and grit pumping and separation system made of three grit classification units. Effluent from the headworks building flows to the raw influent pumping station which includes a 75,000-gallon wet-well and four (4) vertical centrifugal pumps each rated for 20 MGD.

Flow from the raw water pumping station is directed to the five (5) 0.383 MG rectangular primary clarifiers. From the primary clarifiers flow then enters the activated sludge/biological nutrient removal process. The bioreactors consist of five (5) 1.64 MG two-pass biological nutrient removal basins each containing baffle walls which provide ten (10) alternating anaerobic and aerobic treatment zones to promote the breakdown of various organic and inorganic materials, including total nitrogen reduction along with phosphorous removal. Flow from the bioreactors then enters the six (6) 0.763 MG final clarifiers for settling of particulate matter and collection and

transfer of return activated sludge (RAS) to the bioreactor's zone 1. The RAS pumping system consists of nine (9) pumps, all controlled by VFD's for a wide range of speed control.

The final clarifier effluent then flows via gravity into two (2) 0.320 MG chlorine contact tanks where the treated wastewater receives chlorine disinfection, and then sulfur dioxide is applied for de-chlorination prior to final discharge into the Lackawanna River after passing thru a 42" effluent flow meter.

Various chemicals are utilized as part of the treatment process to aid in the removal of nitrogen and phosphorus and as well as for pH adjustment and sludge conditioning. The activated sludge/nitrogen removal process utilizes a proprietary methanol-based feed material (Micro-C) as a supplemental carbon source to enhance the biological treatment process. Alum is utilized to enhance phosphorous removal in the bioreactors and final clarifiers, and pH adjustment is achieved in the bioreactors by utilizing magnesium hydroxide for alkalinity control.

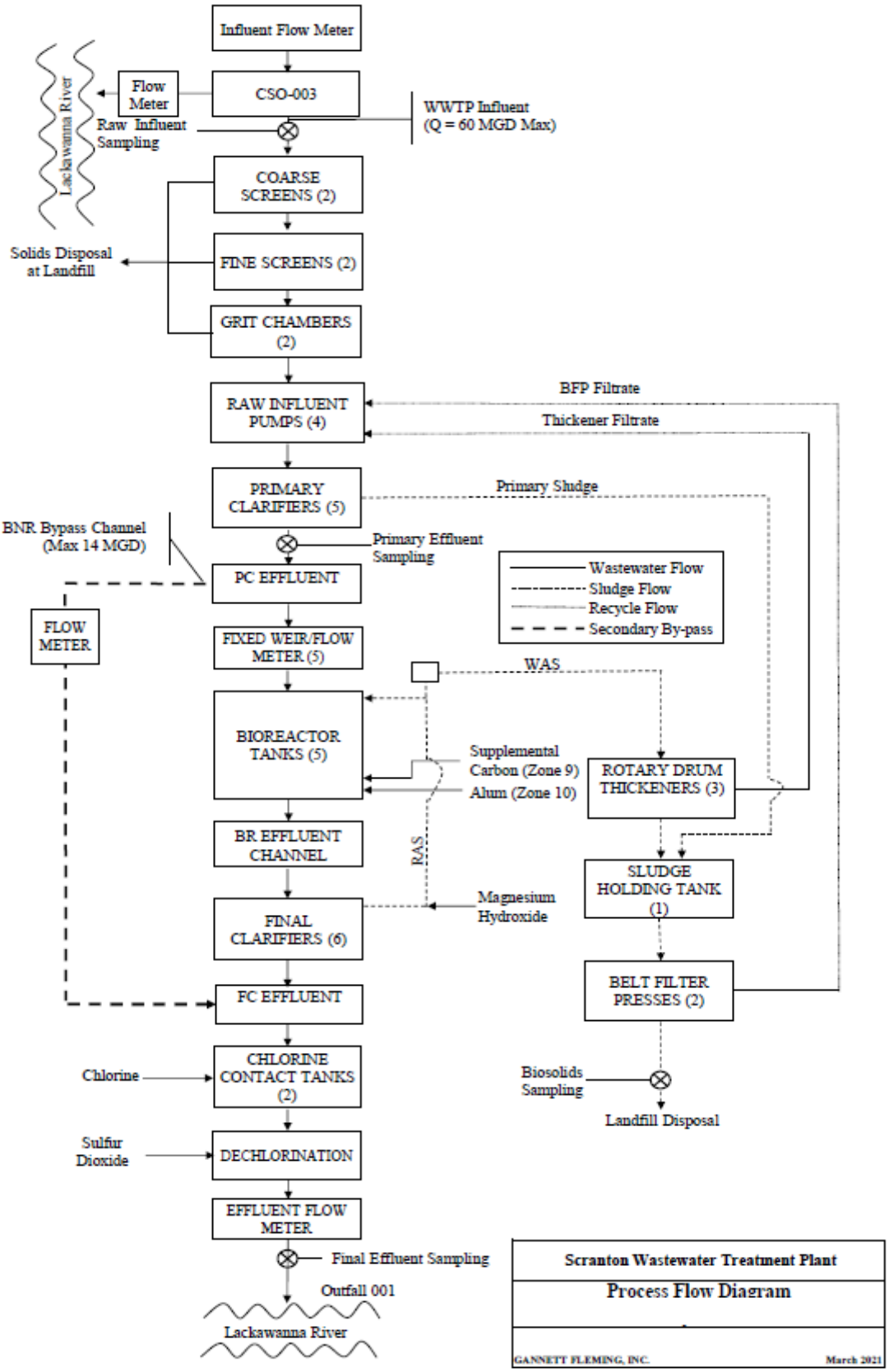
Waste activated sludge from the bioreactors is pumped to three (3) rotary drum thickeners, where the sludge is thickened from 1% solids to 4% and then discharged into a 0.447 MG sludge-holding tank where it is aerated and mixed with the sludge from the primary clarifiers. The mixture of waste activated and primary sludge is fed to two (2) belt filter presses where, with the aid of a polymer feed, it is dewatered to 25-30% solids. The dewatered sludge is discharged to receiving trucks where it is hauled to a landfill for final disposal.

The WWTP flow meters were last calibrated in April 2021.

Certified Operators

The PAWC Scranton WWTP has the following DEP licensed operators available, each holding current wastewater certifications in the Commonwealth, as follows:

- Matthew J. White (Superintendent), Class A, E-1,4, Certificate #S15176
- Christine Wesolowski (Supervisor), Class A-1, Certificate No. S14091
- Kent Mackaliunas, Class A, E-1,4, Certificate No. S17899
- George Novajosky, Class A, E-1,2,3,4, Certificate No. T3725
- Mark Grego, Class A-1, Certificate No. S15960
- Eugenia Roche, Class A, E-1,4, Certificate No. S18226
- Barbara Verrastro, Class A-1, Certificate No. S17994
- Ronald Boeth, Class A, E-1,4, Certificate No. S20021
- Brian Nealon, Class A, E-1,2,3,4, Certificate No. S20126
- Chelsea Payne, Class A-1, Certificate No. S20624,
- Jim Burton, Class B, E- 1,4- Certificate No. S16366
- Jeremy Hull, Class A, E – 1,4 – Certificate No. S22574


Influent Flow Meter
Lackawanna River
Flow Meter
CSO-003
Raw Influent Sampling
WWTP Influent (Q = 60 MGD Max)
COARSE SCREENS (2)
Solids Disposal at Landfill
FINE SCREENS (2)
GRIT CHAMBERS (2)
RAW INFLUENT PUMPS (4)
BFP Filtrate
Thickener Filtrate
PRIMARY CLARIFIERS (5)
Primary Sludge
BNR Bypass Channel (Max 14 MGD)
Primary Effluent Sampling
PC EFFLUENT
Wastewater Flow
Sludge Flow
Recycle Flow
Secondary By-pass
FLOW METER
FIXED WEIR/FLOW METER (5)
WAS
BIOREACTOR TANKS (5)
Supplemental Carbon (Zone 9)
Alum (Zone 10)
ROTARY DRUM THICKENERS (3)
BR EFFLUENT CHANNEL
RAS
SLUDGE HOLDING TANK (1)
Magnesium Hydroxide
FINAL CLARIFIERS (6)
BELT FILTER PRESSES (2)
FC EFFLUENT
Chlorine
CHLORINE CONTACT TANKS (2)
Biosolids Sampling
Landfill Disposal
Sulfur Dioxide
DECHLORINATION
EFFLUENT FLOW METER
Final Effluent Sampling
Outfall 001
Lackawanna River
Scranton Wastewater Treatment Plant
Process Flow Diagram
GANNETT FLEMING, INC.
March 2021

PENNSYLVANIA-AMERICAN WATER COMPANY
SCRANTON WASTEWATER COLLECTION SYSTEM DESCRIPTION

Overview

The Scranton combined sewer system (CSS) provides sewer service to approximately 29,500 connections in the City of Scranton and Borough of Dunmore. The CSS includes a total of approximately 1,759,752 linear feet (333 miles) of sewer mains, including 1,747,750 LF (331 miles) of gravity sewer lines (99%), 12,003 feet (2 miles) of force main (1%), 9,112 manholes, 80 permitted combined sewer overflow (CSO) structures, and 7 pumping stations. The sewer mains range in age from new to over 100 years old; and sizes range from 4-inch force mains to a 108-inch gravity interceptor main. The majority of the sewer mains are approximately 50-100 years old, 8-inch to 24-inch in size and made of vitrified clay, reinforced concrete or PVC plastic. The manholes and CSO regulator chambers are of concrete and/or brick construction.

An estimated 63% of the sewer system is a combined sewer system, conveying combined storm water and sanitary sewage flow to the CSO regulator chambers prior to connection with an interceptor sewer. Under high wet-weather flow conditions that exceed the capacities of downstream facilities, the CSO regulators direct combined wastewater (sanitary sewage and stormwater) to the receiving streams. The permitted CSO discharge points in the sewer system include one (1) WWTP bypass, sixty-three (63) CSO regulators, twelve (12) diversion manholes, and four (4) pumping station overflow outlets.

The Main Interceptor sewer for the Scranton CSS runs parallel to the Lackawanna River, which generally flows through the middle of Scranton City. The Main Interceptor is approximately 5.8 miles in length, starting as a 24-inch diameter pipe at the upstream end of the system at the Leggetts Creek CSO Regulator and increasing to a 78-inch diameter pipe at the headworks to the Scranton Wastewater Treatment Plant (WWTP). The 78-inch diameter portion of the Main Interceptor has a peak flow capacity of about 110 MGD compared to the existing wet weather peak capacity of the Scranton WWTP of 60 MGD.

Capacity/Condition

The sewer mains are adequately sized to meet current and projected flows (overload conditions are not projected during the 2-year projection period) and are in good condition. PAWC maintains a regular program of monitoring collection system conditions via five (5), 2-person full-time work crews, including jetting and cleaning crews, and CCTV inspection and maintenance staff that works in the sewer system by inspecting, cleaning and flushing any problem areas on a regular basis and systematically improving the system as needed.

Lift Stations

PAWC owns and maintains seven (7) pumping stations as part of the Scranton wastewater conveyance system, as follows:

Pumping Station	Type	Rated Capacity (MGD)
Dorothy Street	Wet Well/Dry Well	0.519
Froude Street	Submersible Pumps	0.231
Keyser Valley	Wet Well/Dry Well	1.440
Middle Street	Wet Well/Dry Well	1.297
Myrtle Street	Wet Well/Dry Well	4.400
Parrot Avenue	Wet Well/Dry Well	0.864
Shawnee Avenue	Wet Well/Dry Well	0.432

The stations are cleaned and maintained by PAWC staff on a regular basis to ensure proper and efficient operation, and all have adequate pumping capacity to handle maximum current and projected flows (overload conditions are not projected during the 2-year projection period). Cleaning, repairs, and routine preventative maintenance items are performed regularly, and each station is equipped with standby/emergency power equipment.

Pennsylvania American Water Company
Turbotville Wastewater Plant Description

The Turbotville Wastewater Treatment Plant (WWTP) located in Turbotville Borough and operates under National Pollutant Discharge Elimination System (NPDES) Permit No. PA0028100. The WWTP and sanitary collection system provide service to approximately 300 customers connections in Turbotville Borough. The customer base is primarily residential.

The treatment plant permitted hydraulic capacity is 0.136 MGD. All wastewater flows to a comminutor chamber, where it passes through a 0-300 gpm comminutor. The comminutor chamber is equipped with a 45 degree, two-inch clearance manual bypass bar screen. The wastewater flows by gravity to a 0.25 MGD influent pumping station, which includes two submersible pumps. The influent pump station discharges into a splitter box which is capable of delivering 0 to 100% flow to either secondary treatment unit trains or a combination thereof.

The primary effluent proceeds into two 50,000-gallon aeration tanks where biological treatment occurs. Sludge recirculated from the secondary settling basins is mixed with primary effluent and air is introduced via non-clogging coarse air diffusers to provide treatment. The biologically-activated effluent from the aeration tanks flows by gravity into two 16,700-gallon secondary settling basins where the biomass generated in the aeration tanks is settled out. The settled sludge is either returned back to the head of the aeration tanks or wasted from the process.

The secondary settling basin effluent flows by gravity into two 2,100-gallon chlorine contact tanks and is disinfected. The disinfected effluent flows through the 980-gallon final effluent flow metering chamber and is discharged to an unnamed tributary of Warrior Run (a tributary of the west branch of the Susquehanna River).

The sludge wasted from the activated sludge process is pumped via two 3-inch air lift pumps located in the secondary settling basin to a 29,700-gallon aerobic digestion tank. Liquid sludge is hauled offsite for disposal.

Turbotville Wastewater Collection System

The majority of the collection system is 6-inch HDPE slip-lined into a terra cotta host pipe. The total length of the collection system is approximately 21,900 ft. The collection system includes approximately 91 manholes.

The gravity collection system does not include any pumping stations or force mains..

Pennsylvania American Water Company
Upper Pottsgrove Sewer System Description

Upper Pottsgrove Sewer is in Upper Pottsgrove Township, Montgomery County, Pennsylvania. The system provides public sewer service to approximately half of the Township's residents (1661 EDU), while the other half are serviced by on-lot septic systems to remain under the jurisdiction of the Montgomery County Health Department.

Upper Pottsgrove Wastewater Collection System

The Township's sewage facilities include gravity mains, four (4) pumping stations and associated force mains, and low-pressure force mains (located within public rights-of-way) from privately owned and maintained grinder pumps. Upper Pottsgrove Township (UPT) does not have its own treatment facility and consequently sends all of its sewage to the Pottstown Borough Authority's (PBA) wastewater treatment plant (WWTP). Six (6) leased metering devices, located along the municipal boundary, record flow volumes.

- Four (4) Pumping Stations and associated force mains:
    1. Regal Oaks Pump Station (Permit #4609402) – with approximately 5853 LF 8" SDR-21 force main & air release valve
    2. Pine Ford Road Pump Station (Permit #4694427) – with approximately 1800 LF 5" & 6" force main
    3. Evans Road Pump Station (Permit #4606407) - with approximately 882 LF 6" SDR-21 force main)
    4. Hollyberry Court Pump Station (associated with NPDES Permit #PA0050342) - with approximately 1120 LF 3" force main & air release valve
- Gravity sewer mains varying in diameter from 8" to 18" (approximately 102,000 LF) & 534 Manholes
- Individual service laterals from the sewer main to the property line (1661 UPT customers)
- Low pressure force mains within public rights-of-way (approximately 7,700 LF)

Pennsylvania American Water Company
Wild Acres Sewer (Delaware Sewer) System Description

Delaware Sewer Company was acquired by PAWC in 2021 and is in Delaware Township, Pike County, Pennsylvania. The system provides public sewer service to 39 existing homes in a portion of the Wild Acres development. PAWC serves public water to these 39 residents in this portion of the development as well as the entire Wild Acres Development. The other portions of the Wild Acres Development that are not served by Delaware Sewer Company have on-lot septic systems.

The Delaware Sewer Company certificate of franchise from 1978 describes the sewer service area as Sections 19 through 22 of the Wild Acres subdivision with a total number of lots of 557. Since the original subdivision of 557 lots, many lots have been combined and based upon the current tax parcel maps there are 372 lots within Sections 19 through 22.

Wild Acres Wastewater Treatment Plant

The treatment system consists of two 15,000-gallon septic tanks followed by a non-functioning Rotating Biological Contactor (RBC) treatment process. The volume of the septic tanks is based on information from the owner and has not been verified. Effluent is pumped to a dosing tank which splits flow to the existing sand mounds. The pump station has two pumps with no local alarm and auto-dialer. Based on mapping, the sand mounds appear to be approximately 60,000 ft. square in total area.

Wild Acres Wastewater Collection System

The collection system consists of a gravity system proximate to the treatment plant and a low-pressure sewer collection system in the remaining areas. The collection system consists of approximately 22,000 ft. of low-pressure sewer, 8,700 ft. of gravity pipe, 30 manholes, and one pump station. The majority of the customers are connected to the gravity portion of the system with 3 customers connected to the low-pressure portion of the system adjacent to the gravity system.

YORK WASTEWATER OPERATION

COLLECTION SYSTEM

The collection system is a typical sanitary sewer system that serves customers in the City of York. The collection system is constructed of vitrified clay pipe (VCP), ductile iron, reinforced concrete and PVC pipe. Some of the older large diameter interceptors are constructed of brick. The manholes are constructed of either brick or precast concrete with cast or ductile iron frames and covers. There is approximately 489,000 feet of collection system piping that ranges 6 to 27 inch in diameter. The collection system also conveys flows from seven (7) interconnected municipalities through approximately 65,000 feet of Interceptors that range in size from 8 to 72 inch in diameter that conveys floes form the municipalities directly to the York Wastewater Treatment Plant.

LIFT STATION

There is one lift station within the York Wastewater System. This lift station serves the north-eastern portion of the York City Industrial Park. This duplex pump station was installed in 1979. The pump station consists of two 7.5 horsepower centrifugal pumps designed to operate as a single pump and standby pump. The pump station is capable of pumping 310 gpm at a Total Dynamic Head of 40 feet. There is a backup power generator and telemetry system.

WASTEWATER TREATMENT PLANT

The York Wastewater Treatment Plant has a Design Capacity of 26 MGD and provides primary, secondary and tertiary treatment of domestic, commercial, and industrial wastewater. Primary treatment consists of preliminary influent screening, grit removal basins, and primary clarification. Secondary treatment consists of five (5) aeration tanks that treat the wastewater through a biological nutrient removal (BNR) process prior to secondary clarification. Cloth Filters are used for tertiary treatment for additional removal of phosphorus and total suspended solids. Disinfection is accomplished using ultraviolet (UV) light disinfection. The treated effluent is directed to the Codorus Creek and is equipped with a step aerator. Solids handling process is provided with two (2) gravity belt thickeners (GBT), two (2) primary anerobic digesters, one (1) secondary digester and two (2) centrifuges.