

CLARION WASTEWATER OPERATION

COLLECTION SYSTEM

Pennsylvania American Water (PAW) purchased the Clarion wastewater collection and treatment system from the Clarion Area Authority (CAA) on October 30, 2008. PAW operates a 1.75 MGD Wastewater Treatment Plant (WWTP), five (5) lift stations, and collection and conveyance sewers necessary to service Clarion Borough, Clarion Township, Monroe Township and a portion of Strattanville Borough in Clarion County. The system serves a population of approximately 6,600 through 2,200 customer connections.

The collection system contains approximately 171,000 lineal feet of 6" to 24" sewer mains consisting of vitrified clay and PVC pipe. The majority of the pipe is vitrified clay with the oldest pipes being installed 70 to 80 years ago. The system also contains approximately 900 manholes. The majority of the manholes are of brick and mortar construction with the remainder constructed of precast concrete.

PAW operates and maintains five lift stations on the collection system. Strattanville Borough operates and maintains one lift station which discharges to the PAW system. The Toby (Third Avenue) lift station has two pumps rated at 250 gpm each. The Liberty lift station has 2 sets of pumps consisting of 2 pumps per set that operate on VFDs, which ramp each set of pumps up to their 1,270 gpm capacity as needed. The Mays lift station has two pumps rated at 240 gpm each. The Chernicky lift station has two pumps rated at 20 gpm each. The Hemlock Ridge lift station has two pumps rated at 110 gpm each. The Corridor lift station, which is operated by Strattanville Borough has two pumps rated at 70 gpm each.

The collection system also receives waste from a collection system owned and operated by Strattanville Borough and also from the Clarion University of Pennsylvania campus collection system. The Clarion system has one industrial user that discharges industrial waste to their system. The industrial user, Owens-Brockway Glass Container Company, is a manufacturer of glass containers. Industrial waste discharged intermittently to the sewer system is contact and noncontact cooling water. Pretreatment consists of an API oil separator.

WASTEWATER TREATMENT PLANT

The Clarion Wastewater Treatment Plant (WWTP) utilizes the contact stabilization activated sludge treatment process. This process uses activated sludge that is returned from the treatment system to provide the microorganism required to treat the incoming waste.

The flow enters the treatment plant through a barminutor to screen the influent for large solids and then comminute these solids into smaller pieces. After comminution the influent enters the grit removal portion of the treatment process. Grit settling is enhanced by the application of diffused air. This is added by means of an air diffuser that is located near the bottom of the grit

chamber. This diffused air mixes the wastewater and promotes grit settling. The aeration also pre-treats the influent prior to the contact tank.

As the influent exits the aerated grit chamber it enters the flow equalization weir box. The flow equalization weir box protects the treatment plant by preventing flows in excess of the plant's treatment capacity from overwhelming the process units. As the flow reaches plant capacity the weir box redirects a portion of the flow into the equalization tank. This reduces the instantaneous peak hydraulic flows on the treatment process and helps to keep solids from washing out of the treatment units during periods of high influent flow. The equalization tank is mixed by means of an aeration system. The equalization tank drains to the clarifier wet well and is pumped back into the treatment system to undergo normal treatment.

At flows of less than plant capacity, all of the influent enters the normal treatment process. The degrittied influent enters 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 sludge from the clarifier is added to the stabilization tanks. The stabilization tanks undergo aeration which reactivates the sludge. A portion of the reactivated 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 digester. The digester is aerated and serves to eliminate the volatile solids in the sludge; stabilizing the sludge prior to drying via the belt filter press. After treatment through the belt filter press the sludge is disposed of at a landfill.