

City of Akron, Ohio Water Reclamation Facility



“People dedicated to protecting the environment, for this and future generations, through innovative and cost effective means.”



AKRON
WATER RECLAMATION SERVICES
Your Clean Water Resource.

City of Akron
Water Reclamation Facility
2460 Akron-Peninsula Road
Akron, Ohio 44313
Phone (330) 375-2963
Fax (330) 375-2966

Dan Horrigan
Mayor

John O. Moore, Director
Department of Public Service

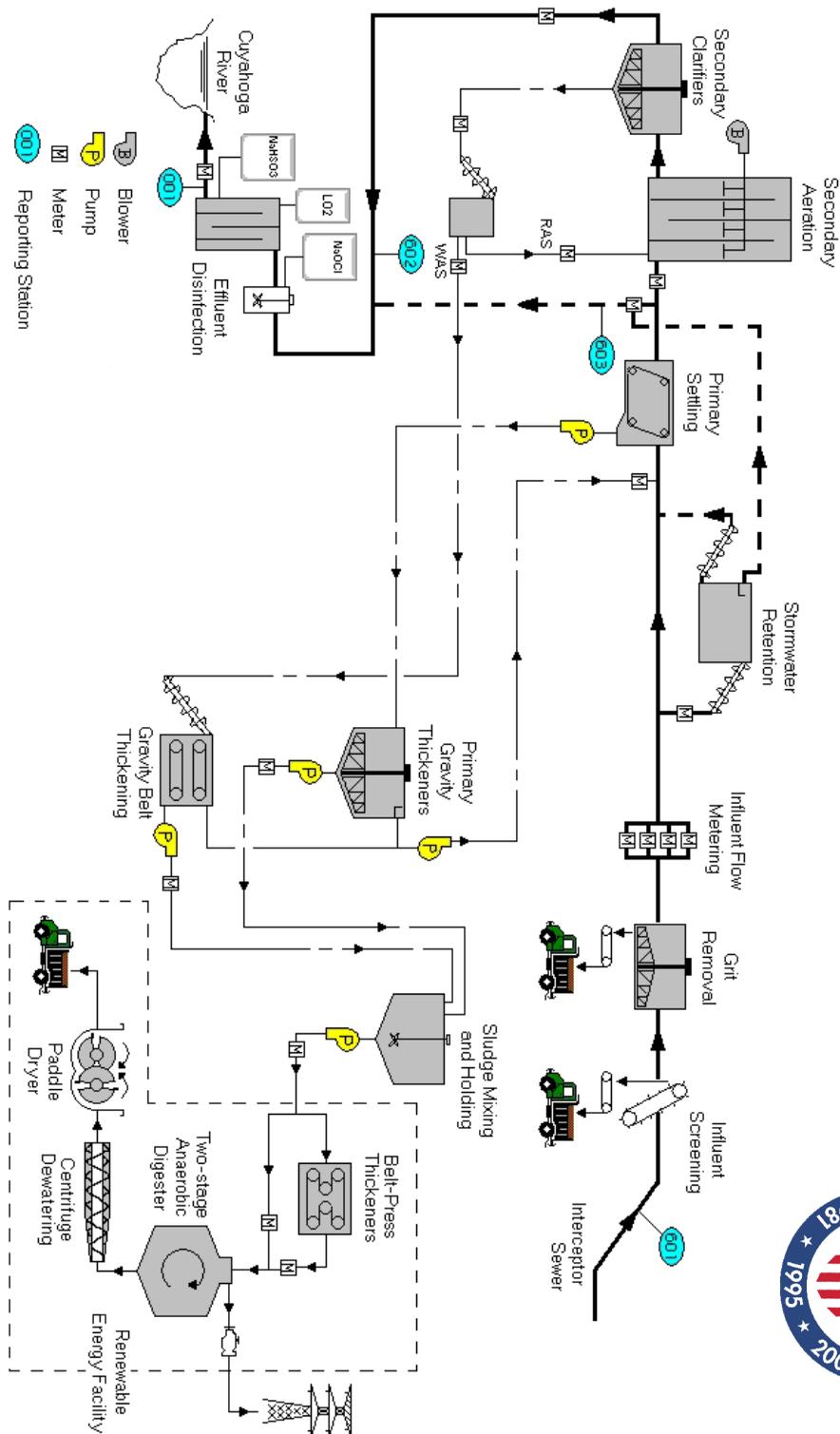
Brian M. Gresser, P.E., Manager
Water Reclamation Services

Vincent J. Zampelli, Superintendent
Water Reclamation Facility

Visit us on the web at:
www.akronohio.gov/sewer



Water Reclamation Facility
Process Flow Diagram



INTRODUCTION

Technology gives us the capability to treat wastewater so that the processed water can be safely returned to the environment. The City of Akron Water Reclamation Facility utilizes proven treatment processes such as the Activated Sludge process. The existing plant has been in continuous service since 1928. There have been, and continue to be, numerous expansions and improvements to the Akron facilities to keep up with changing environmental conditions and restrictions.

SERVICE AREA

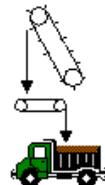
The City of Akron treats its own wastewater and that of several neighboring communities. The total area served is about 96 square miles with an estimated population of 330,000. Neighboring communities served include Cuyahoga Falls, Stow, Springfield, Mogadore, Lakemore, Tallmadge, Fairlawn, Bath, Montrose and some unincorporated areas in the county.

The daily average flow to the plant in 2015 was 70.8 million gallons per day (MGD), with peaks (rain, snow/thaw) reaching 259 MGD. Part of the collection system has combined sewers, which means sanitary wastewater and storm water is carried to the treatment plant through the same pipes. Presently the Akron WRF is considered to have a firm Preliminary treatment capacity of 210 MGD, a Primary treatment capacity of 150 MGD, and a Secondary treatment capacity of 130 MGD.

PRELIMINARY TREATMENT

INFLUENT SCREENING

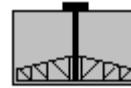
There are 4 continuously cleaned screens, which are rotated in and out of service to distribute wear evenly among the units. These influent screens remove material such as rags, leaves, sticks, etc., that would clog pumps and pipelines. Material larger than about 1/4 inch is screened from the influent



wastewater. The screened material is disposed of by landfilling.

GRIT REMOVAL

The grit removal tanks remove sand and other grit-like materials that would cause wear to pumps and clog pipelines. Four quick-settling tanks are designed to remove the grit, but not the light organic solids. The grit is disposed of by landfilling.



STORM RETENTION TANKS

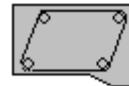
The function of the Storm Retention Tanks is to provide flow equalization through temporary storage of wastewater during periods of high flow. When high flows subside, wastewater is pumped out of the basins and sent to Primary Treatment.



PRIMARY TREATMENT

SEDIMENTATION AND FLOATATION

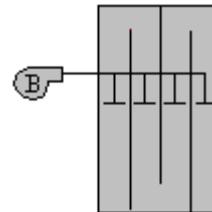
Primary treatment removes organic solids by sedimentation and flotation. The solids that settle to the bottom of the 24 Primary settling tanks are collected and pumped to the Gravity Thickener Tanks. The treated primary effluent flows to secondary treatment. Grease and other light matter are removed from the surface of the tanks and dewatered for disposal.



SECONDARY TREATMENT

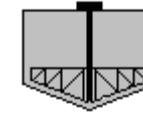
SECONDARY AERATION (Activated Sludge)

The Activated Sludge Process is an aerobic, suspended growth, biological treatment method. It uses the metabolic reactions of microorganisms to produce a high quality effluent by converting and removing substances that have an oxygen demand. To sustain the aerobic bacteria, approximately 40 million cubic feet per day of air (oxygen) is required.



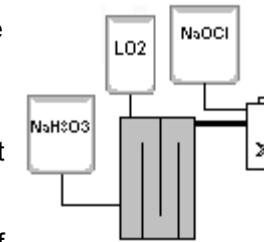
SECONDARY CLARIFIERS

After a period of approximately 8 hours in the aeration tanks, the wastewater flows into Secondary Clarifiers. The solids are separated from the treated wastewater by gravity settling. The treated wastewater leaves the clarifiers and then flows to the Chlorine Contact Tanks. The solids (microorganisms) that settle to the bottom of the clarifiers are mostly returned to the Aeration Tanks to feed on the incoming organic waste. That which is not returned is sent to the Gravity Belt Thickeners for volume reduction prior to further treatment.



EFFLUENT DISINFECTION

Before the water is released to the Cuyahoga River, it is disinfected with Sodium Hypochlorite (a strong bleach) to kill pathogenic organisms. Approximately 30 minutes of contact time is allotted for the disinfecting process to take place. To reduce the chlorine residual of the treated effluent, Sodium Bisulfite is fed prior to the plant discharge point.



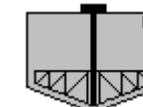
EFFLUENT OXYGEN

An Oxygen enhancement system is utilized at the plant effluent area, typically during periods of high flow. Its purpose is to ensure that the dissolved oxygen of the plant effluent is no less than 5.0 mg/L at all times, which is mandated by regulation. Liquid Oxygen is vaporized and released at the bottom of the last pass of the chlorine contact tanks.

SOLIDS HANDLING AND DISPOSAL

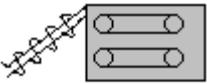
PRIMARY GRAVITY THICKENERS

Solids removed from the Primary Settling Tanks are pumped to the Primary Gravity Thickeners, where they are thickened by gravity settling to about 5% solids. The thickened solids are then pumped to the Mixing and Holding Tanks.



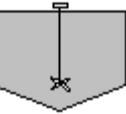
GRAVITY BELT THICKENING

Waste activated solids from the Activated Sludge Process at about 1.4% solids flow to the Gravity Belt Thickeners. Gravity belt thickening concentrates chemically conditioned solids through the gravity separation of water and solids on a continuously moving porous horizontal belt. Thickened solids at about 6% solids are then pumped to the Mixing and Holding Tanks.



MIXING and HOLDING TANKS

Thickened Primary and Waste Activated solids are pumped to the Mixing and Holding Tanks and blended together and stored for further processing. There are a total of six tanks, each with a one million gallon capacity.



AKRON RENEWABLE ENERGY FACILITY

The blended, thickened biosolids are pumped under the Cuyahoga River to the City of Akron Renewable Energy Facility. There, the biosolids go into a high-solids anaerobic digester at about 15 – 18% dry solids. The biosolids decompose and generate methane gas in the process, which is captured, conditioned and used as a fuel source for engine-driven generators, producing about 1.2 megawatts of power. The digested solids are then dried, pelletized and sold as a soil conditioner.

