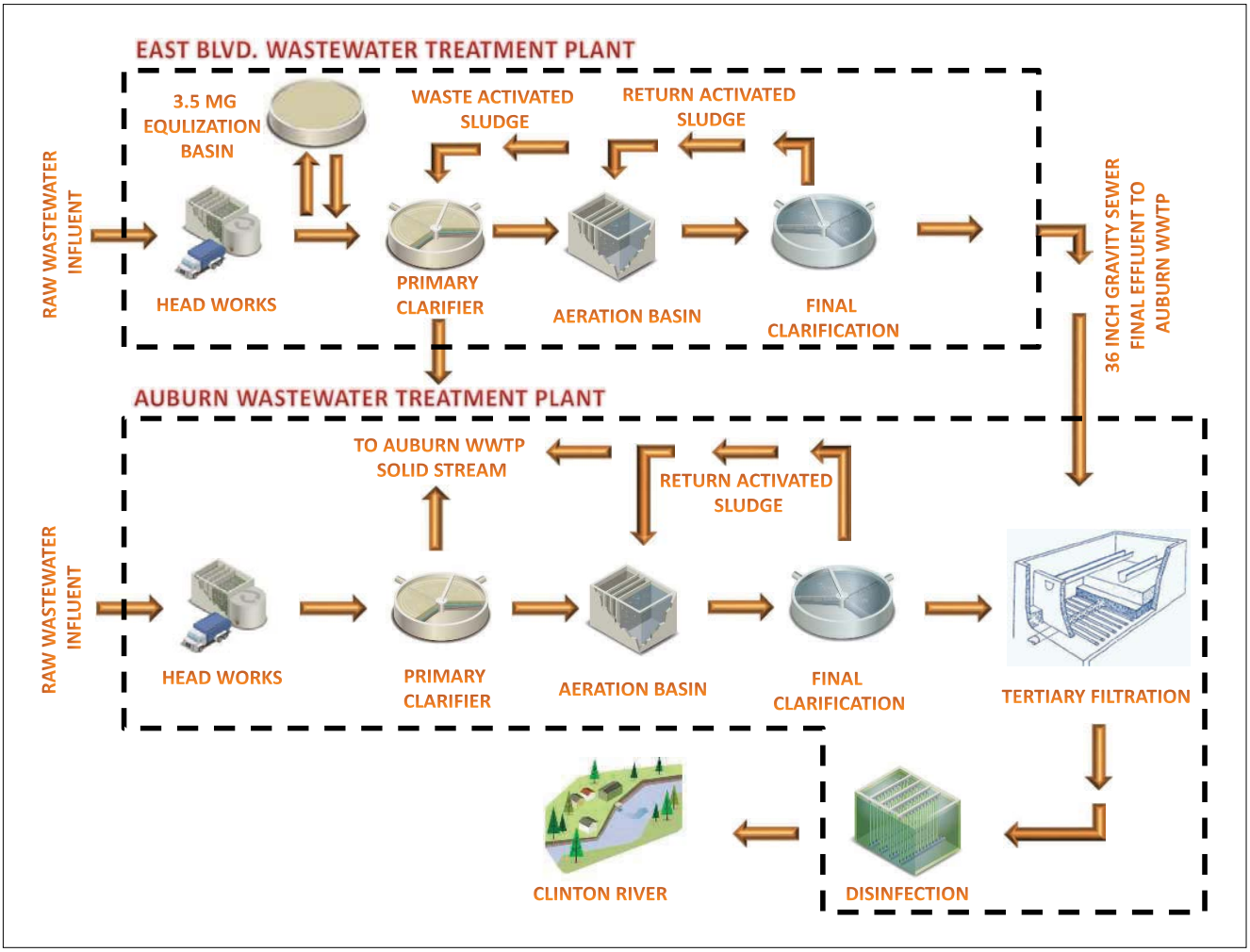
Clinton River Water Resource Recovery Facility

The Clinton River Water Resource Recovery Facility has gone through several changes in ownership, process, and operational responsibilities through the years. Oakland County purchased the facility in 2012 from the City of Pontiac and then established a drainage district, a separate and distinct legal entity, to oversee its operation. The plant currently serves 55,000 Pontiac residents, along with 1,835 people from the City of Sylvan Lake.

The plant is able to treat and send 30% of the flow produced by the 125,038 people in the Clinton-Oakland Sewage System, which includes 14 communities in the eastern portion of Oakland County. The remaining 70% of the flow is pumped to the Great Lakes Water Authority in Detroit. The plant is split into two facilities: the Auburn Road plant, built in 1960, and the East Boulevard plant, which was constructed in 1932.

Plant Name	Clinton River Water Resource Recovery Facility
First Started Operation	1932 with Primary Treatment at the East Boulevard Plant and 1960 at the Auburn Plant
Average Day Flow	22 MGD
Design Flow	30.6 MGD
Preliminary Treatment Process – East Blvd	1 - 1/8 inch fine screen
Preliminary Treatment Process – Auburn	2 -1/4 inch fine screens
Grit Removal – East Blvd	Grit Settling Chamber with Grit Washing
Grit Removal – Auburn	Aerated Grit Chamber with Grit Washing
Secondary Treatment Process – East Blvd	Activated Sludge
Secondary Treatment Process – Auburn	Activated Sludge with Real Time Control
Tertiary Treatment Process	Mixed Media, Granite, Anthracite and Sand
Biosolids Treatment Process	Thermal Hydrolysis Process (THP)
Ultimate Disposal	Landfill and Land Application
Disinfection/Dechlorination	Sodium Hypochlorite/Bisulfite
Effluent Discharge To:	Clinton River
Odor Control	D3W Planet Breeze
Number and Breakdown of Staff	33 Staff Funded: 2 Administration, 8 Management, 12 Operators, 9 Maintenance, 2 Chemists, IPP
Annual Budget	$14 Million Per Year for O&M and Debt Reduction



Together, they treat a combined average of 22 million gallons per day (MGD) with a design capacity of 30.6 MGD. The two plants treat wastewater that comes in from residential, industrial, and commercial locations. Both plants utilize a conventional activated sludge treatment process.

Liquid Treatment

The wastewater enters the system and is collected through a gravity sewer into a diversion chamber at the East Boulevard plant, where there is course screening with a two-inch claw type screen. Flow from there is split to the East Boulevard Plant's headworks or a mixing chamber at a rate of 8 MGD. The wastewater then joins the flow from the Clinton-Oakland and is sent by gravity to the Auburn treatment plant.

East Boulevard Plant

There is fine screening (1/8-inch openings), followed by grit removal and primary clarification. It is then sent to the aeration tanks and clarifiers for secondary treatment. Effluent from the secondary clarifiers flows by gravity to the Auburn plant for tertiary treatment. Primary sludge is pumped to the Auburn plant primary clarifiers for co-settling.

Auburn Plant

There is grit removal, followed by fine screening (1/4-inch openings) and primary clarification. It is then sent to the aeration tanks and clarifiers for secondary treatment. Effluent from the secondary clarifier flows by gravity to the Archimedes screw pumps, and the water is lifted for tertiary treatment of mixed media filters. The media consists of granite, anthracite, and sand. The combined flow is disinfected with Sodium Hypochlorite and dechlorinated with Sodium Bisulfite. The final effluent is discharged to the headwaters of the Clinton River.

Solids Treatment (Current)

The secondary biosolids are co-settled with primary sludge and sent to two-stage anaerobic digesters. Digested sludge is dewatered with belt filter presses and then final disposal goes to either a landfill or used in land application, depending on the season.

Solids Treatment (Future)

Oakland County Water Resources Commissioner Jim Nash oversees the building of a system that will process 26 dry tons per day to Exceptional Quality (EQ) Class A sludge through a Thermal Hydrolysis Process (THP), followed by Anaerobic Digestion. When this starts in the fall of 2019, it will be the third system in the country to be online. The process is both high temperature (330°F) and high pressure (90 psi).

General Information

It is Commissioner Nash's goal to be on the leading edge of technology by providing a high quality, stabilized effluent to the Clinton River by improving the background flow and,

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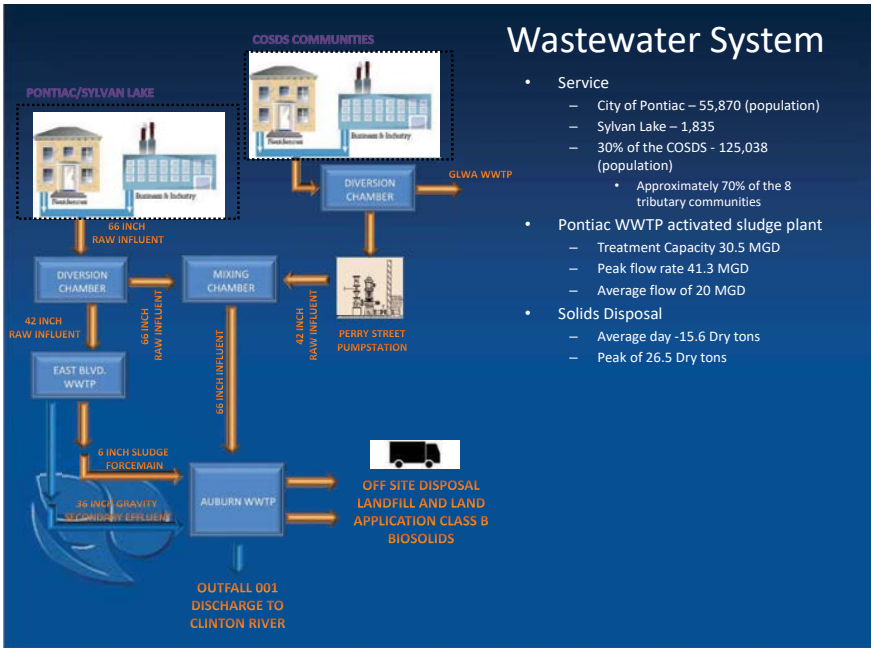

at the same time, reducing the energy required to produce clean water.

The wastewater system has gone through several major upgrades since the 1970s. At the Auburn plant, another train of activated sludge was added, as well as solids handling and tertiary treatment.

Real-Time Control of the secondary system was added in 2016 by changing the monitoring of dissolved oxygen used in the aerations tanks. There is process monitoring for oxygen, ammonia, and nitrate, allowing real-time control of the blowers and a reduced electrical bill. Detroit Edison awarded more than $30,000 in cash back for this improvement. In 2017, construction began on a $34 million addition to provide EQ Class A solids with (THP)-CAMBI. Upgrades in the laboratory, control room, conference room, maintenance shop, and administration areas in the main building also were completed. In short, the Clinton River has seen improved benefits with the increase of stabilized water.

The plant is staffed 24-hours a day, seven days a week, with minimal staffing on weekends. There are 33 employees to cover administration, operation, plant maintenance, and industrial pretreatment, along with a full-service laboratory. Currently, there are eight licensed operators and the commissioner is looking to fill more positions. The operators rotate shifts for full coverage and adjust the plant process via its Supervisory Control and Data Acquisition (SCADA) system. Employees observe regular check points and duties throughout the plant. The maintenance staff performs preventive, predictive, and corrective maintenance and utilizes a small workshop to fabricate and work on small parts.