

Cortland Wastewater Treatment Facility

SUNY Cortland BIO 111 tours

The background of the slide is a solid blue color. In the lower half, there are several faint, light blue circular ripples that resemble water droplets or raindrops, scattered across the bottom of the slide.

Serving Cortland, Cortlandville, Homer and McGraw

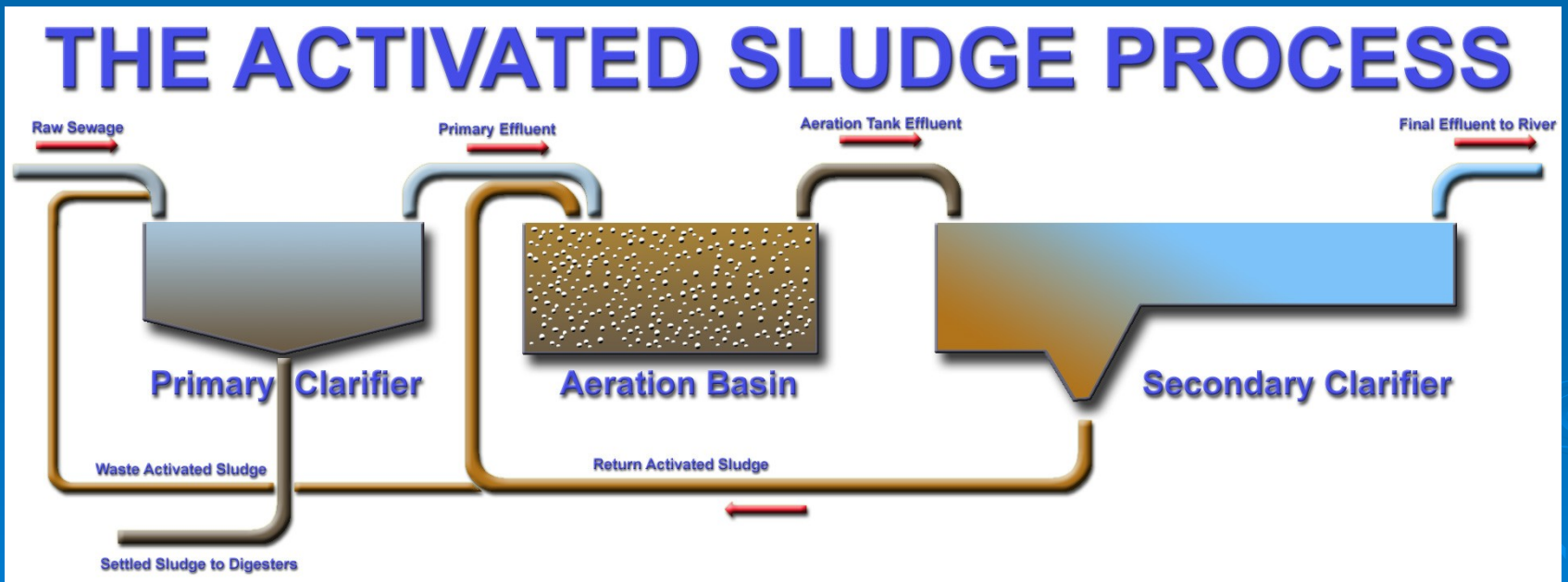


Why Treat Wastewater?

- Wastewater can contain pathogens and is a public health hazard.
- Wastewater has organic content, and will reduce oxygen in the receiving water when bacteria utilize the organics as food.
- Wastewater has biological nutrients (nitrogen and phosphorus) and can cause unwanted algal and plant growth and subsequent eutrophication.

Activated Sludge

- Gravity Sedimentation
- Aerobic Respiration



Gravity Sedimentation

- Particulate organic material will settle out of suspension at 10 feet per hour
- Clarifiers are sized to provide at least 2 hours detention time to achieve good settling and solids compaction
- Cone-shaped bottom and rotating collectors move sludge to pump inlet pipe

Biological process

- Large population of live microorganisms are maintained in contact vessels through which the primary effluent flows.
- Vessels are sized to provide 4 to 6 hours detention time.
- Microorganisms assimilate the dissolved organics as a food source, converting it to additional cellular mass and byproducts of respiration (mostly carbon dioxide and water).

Disinfection

- To prevent pathogens from entering the receiving stream, treated wastewater must be disinfected.
- Cortland uses chlorine as a disinfecting agent.
- Cortland is required to disinfect from May 15 to October 15 each year
- After disinfection, sulfur dioxide is used to neutralize the chlorine before discharge.

Anaerobic Sludge Digestion



Anaerobic Digestion

- Organic material removed during the activated sludge process is treated using anaerobic digestion.
- Under anaerobic conditions, acid-forming and methane forming bacteria reduce the complex organic material to simpler, more stable forms.
- Digestion process takes at least 12 days.

Government Regulation

- National Pollutant Discharge Elimination System regulates any “point source” which discharges into waters of the United States.
- NYS Department of Environmental Conservation administers the program in this state.
- Cortland operates its wastewater facility under SPDES permit NY0027561.

Secondary Treatment

- Municipal dischargers are required to treat to “Secondary Treatment” standards.
- Secondary treatment is defined as no greater than 30 mg/l BOD or TSS and no less than 85% removal for BOD or TSS, averaged by month.
- Cortland’s permit has a slightly more stringent BOD limit of 25 mg/l.

Biological Nutrients

- Nitrogen and phosphorus are present in domestic sewage.
- These chemicals stimulate excessive algae and plant growth, which can result in eutrophication.
- Cortland has an ammonia limit of 205 lbs/day in the summer and 635 lbs/day in the winter, but is otherwise not currently required to remove biological nutrients.