SOLIDS HANDLING

Sludge Concentration

The raw sludge and the waste activated sludge from the final clarifiers are both sent to holding tanks and allowed to settle and further concentrate the solids.

Dewatering

The waste activated sludge is first dewatered in large centrifuges. The **"cake"** is then mixed with the raw sludge and dewatered again in smaller, more efficient centrifuges. The final product is between 25- 30% solids.

Incineration and Composting

The cake is either incinerated or sent to the city's Compost Facility to make a popular gardening product called Com-Til. The product is available to the public - call 645-3153 for more information.

FOR MORE INFORMATION

Southerly Wastewater Treatment Plant
6977 S. High Street
Lockbourne, OH 43137
(614) 645-3248
Fax 645-6006
www.sewers.columbus.gov

Tours are provided to the public at no charge by appointment only.

Southerly Wastewater Treatment Plant
6977 S. High Street
Lockbourne, OH 43137

SOUTHERLY WASTEWATER TREATMENT PLANT PROCESSES

City of Columbus
Department of Public Utilities
Division of Sewerage and Drainage

Michael B. Coleman,
Mayor

The Southerly Wastewater Treatment Plant (WWTP) was built in 1967 and is the larger of the two treatment facilities serving the Columbus metropolitan area. The plant removes pollutants from the wastewater through a biological process and discharges clean water into the Scioto River. At the discharge point, the Scioto has been designated a "warm water habitat" by the Ohio EPA. The City of Columbus maintains a National Pollutant Discharge Elimination System (NPDES) permit from the Ohio EPA to ensure compliance with clean water regulations.

The Columbus wastewater collection system consists of 2,782 miles of sanitary sewers and 167 miles of combined sewers that collect domestic and industrial wastewater as well as rainwater from the combined system. An additional 2,537 miles of storm sewers discharge to creeks and rivers untreated. The Southerly WWTP treats flow from mainly the north-eastern and eastern sections of Franklin County, while the Jackson Pike WWTP serves mainly the western half.

The Southerly WWTP has a design capacity of 114 million gallons per day (MGD). The population equivalent for the design capacity is 2 million people. Average flow for 2005 was 96 MGD.

Southerly in 1967

The treatment process consists of two categories:

- The Wet Stream
- Solids Handling

THE WET STREAM

Preliminary Treatment

Preliminary treatment consists of screening out large objects from the wet stream. Next, we remove sand and grit by slowing the velocity of the water and allowing the grit to settle. Large scrapers remove the grit from the bottom of the tank.

Primary Treatment

The wet stream is slowed to less than 1 foot per minute to allow the settleable solids in the raw wastewater to sink to the bottom of a large tank. Here the solids are collected for later disposal. Fats and oils are skimmed off the top of the tank. The only solids remaining in the water are either suspended or dissolved. This **"primary effluent"** is gravity fed into the aeration tanks.

Secondary Treatment

The primary effluent is mixed with seed bacteria from the final clarifiers without oxygen in the first stage of the aeration tanks. In the second stage, bound oxygen is present. Nitrate is reduced to nitrite and finally nitrogen gas. The third stage uses final bubble aeration to mix and provide oxygen to the bacteria in order to oxidize all of the suspended and dissolved solids. The flow is now called **"mixed liquor."**

Final Clarification

The mixed liquor enters the final clarifier in the center of the tank. As the flow radiates outward toward the outer weir, the bacteria form colonies in a process called **"flocculation**." As the colonies increase in size, they sink to the bottom of the tank where they are removed. This is called **"Activated Sludge."** Most of this is returned to the aeration tanks as seed (RAS). The remainder is called **"Waste Activated Sludge"** (WAS) and is processed in the **"Solids Handling"** part of the plant.

Disinfection

During the summer months, we disinfect the plant effluent with Sodium Hypochlorite to remove any pathogens that might be present. To prevent a discharge of excessive chlorine to the river, we remove the Hypochlorite with Sodium BiSufite at the end of the process.