

Public Utilities Department
April 14, 2016
Delaware Citizens Academy
Brad Stanton, Director



Utility Fast Facts

- Average household uses 107,000 gallons of water each year.
- 1,851 gallons of water to refine 1 barrel of crude.
- 1,500 gallons of water to process 1 barrel of beer.
- Over 42,000 gallons of water to grow and prepare food for typical Thanksgiving dinner for eight.
- Leaking faucet can waste 100 gallons of day.
- Yearly U.S. toilet paper use: 22,500 square miles
- Gallons of U.S water flushed daily: 5 billion
- Amount spent annually on chemicals to make toilets smell better: \$10 million

Public Utilities Staff

7 Divisions – 36 Employees

Administration

Wastewater Treatment

Sewer Collection

Storm Sewer

Water Treatment

Water Distribution

Watershed Management

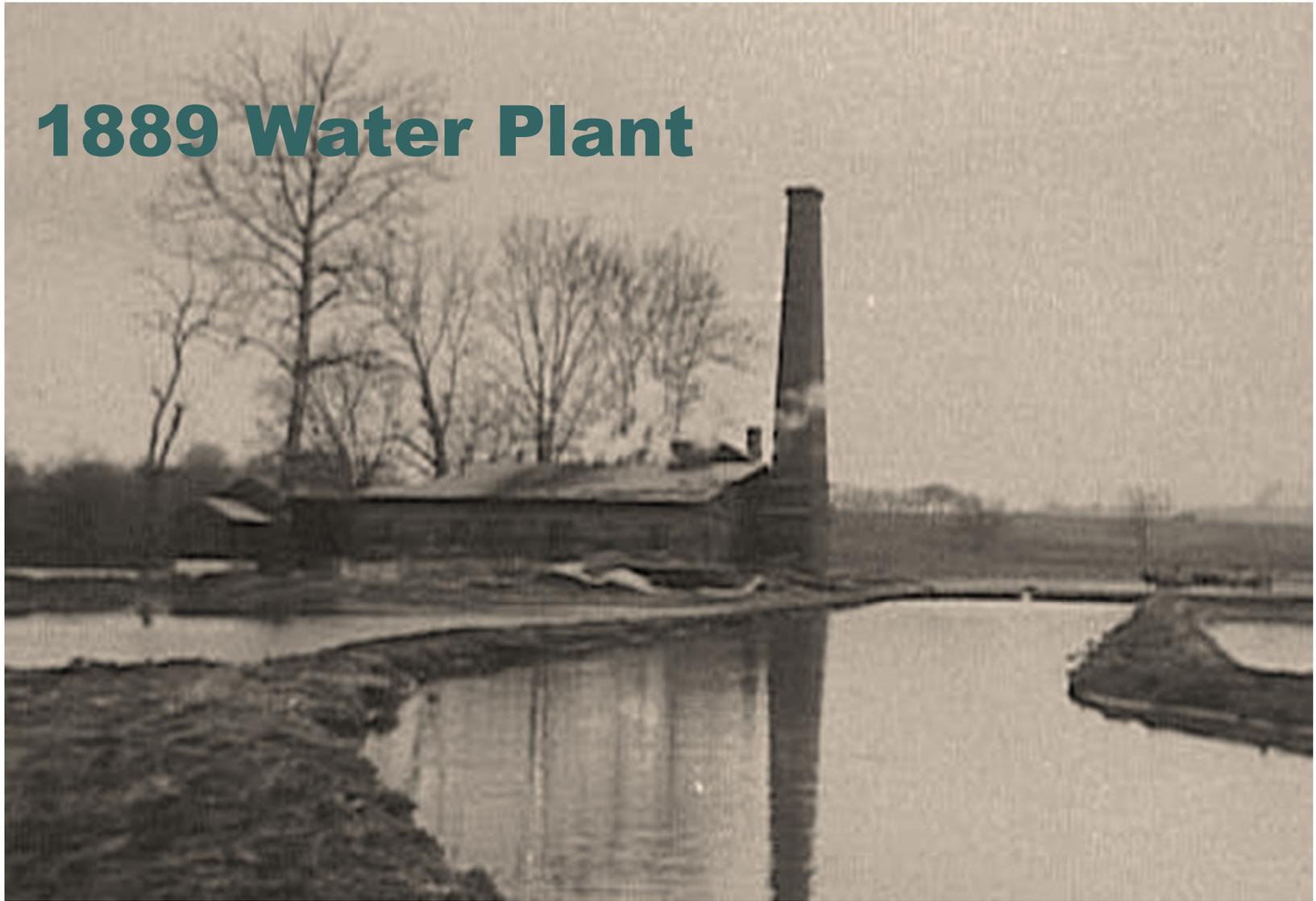
Utility Infrastructure

- 190 miles of water mains
- 1,950 fire hydrants
- 175 miles of sanitary sewer 'gravity' mains
- 3,250 manholes.
- 5 miles of sanitary sewer 'force' mains
- 12 sanitary sewer pump stations
- 150 miles of storm sewers

Water Treatment Plant

- **1889** – Private water plant constructed
- **1936** – City purchased for \$560,000
- **1960** – Second 16” main was constructed
- **1974** – Expanded from 3 MGD to 6 MGD. (\$6,000,000)
- **2011** - Construction of 24” water transmission main
- **2012** – Construction of 16” Penry Road raw water line
- **2012** – Construction of 7.2 MGD Plant (\$31,300,000)
- **2014** – New water treatment process goes on-line

1889 Water Plant



Water Treatment

- Plant Design 7.2 MGD; Peak 5.5 MGD
- Three water towers – 4 M.G. Storage
- Chemicals used
 - Orthophosphate - corrosion
 - ACH – coagulation
 - Fluoride – tooth decay
 - Chlorine – Disinfection
 - Sodium Bisulfite
 - Sodium Hypochlorite
- Plant staffed 24/7

How We “Make” Water

Surface Water (from the Olentangy River)

1. River pump station
2. Settling tanks
3. Ultrafiltration
4. Nanofiltration
5. Degassifiers
6. To water towers
(About 8 hours)

Ground Water (from wells)

1. Pressure filters
2. Nanofiltration
3. Degassifiers
4. To water towers
(Less than 8 hours)

Major Water Plant Improvements

- 7.2 MGD groundwater & surface water membrane treatment system.
- Rehabilitation of river intake screens & pump stations.
- Ultrafiltration and nanofiltration facility
- New 1-million gallon concrete clearwell.
- New 1,250 kW standby generator.
- Improvements to Wellfields (4.0 MGD).

Water Plant Construction – October 2012 - April 2015



Water Plant Construction October 2012 – April 2015



Water Plant Construction October 2012 – April 2015



Water Plant Construction October 2012 – April 2015



Water Plant – 2016



Educational Center



Wastewater Treatment Plant

- **1902** – First plant
- **1927** – Expansion to serve a population of 14,500 (\$202,500)
- **1972** – Upgrades to meet Clean Water Act
- **1986** – Plant expansion from 3.6 MGD to 5.5 MGD (\$7.5 million).
- **2007** – Plant expansion from 5.5 to 10 MGD (\$22 million).

Wastewater Plant – 2016



Wastewater Plant -2016



Domestic Wastewater Sources

Toilets: 33 %

Washing: 26%

Bathing: 19.6%

Bathroom sink: 11.3 %

Kitchen sink: 5.8 %

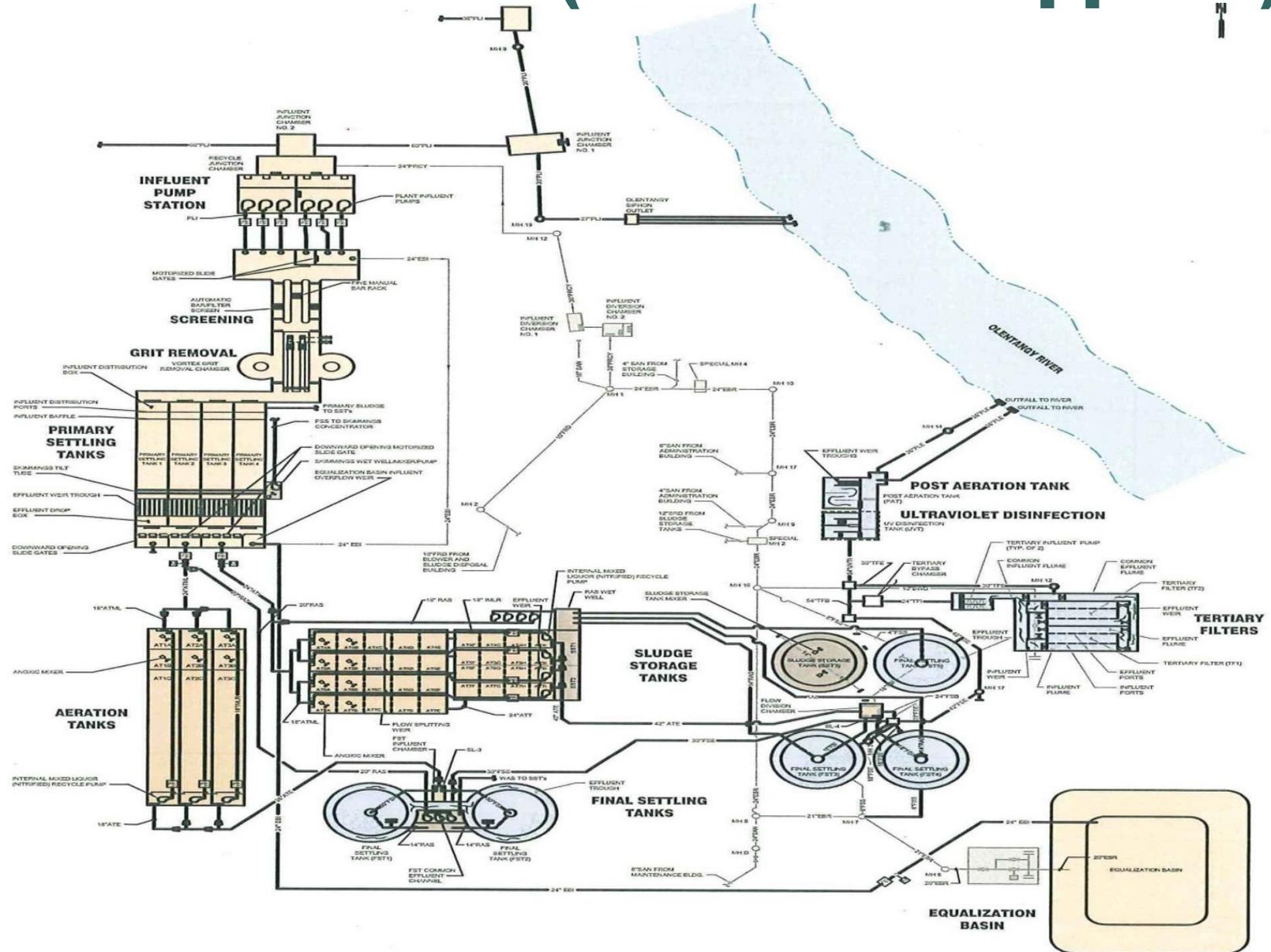
Dishwasher: 2.5 %

Garbage disposal: 1.8%

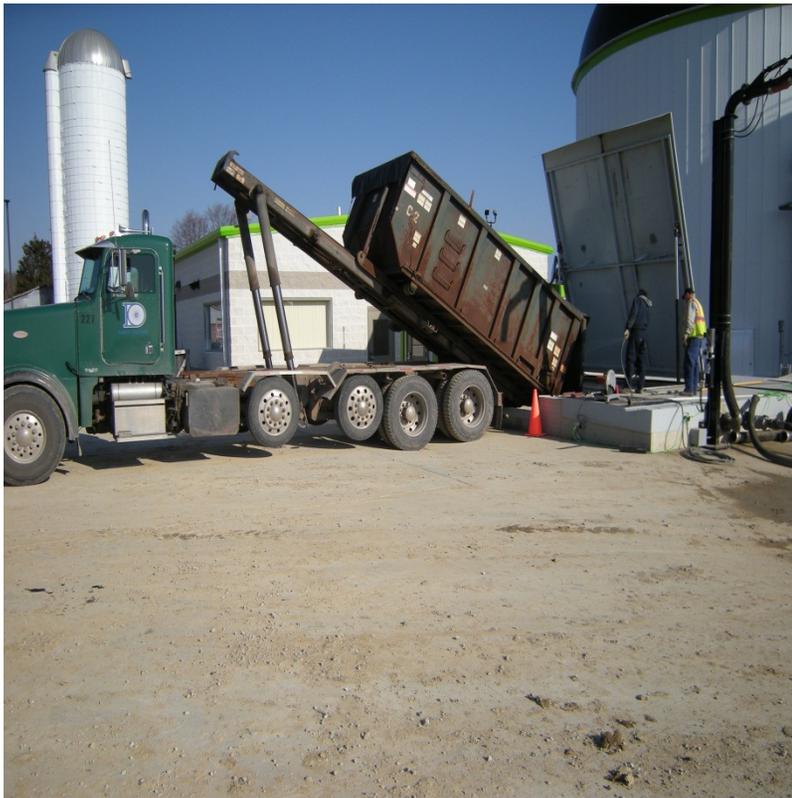
Wastewater Treatment

- Plant Design – 10 MGD; Average – 5.50 MGD
- Peak – 30+ MGD
- Staffed 24/7
- Chemicals Used
 - Ferric Chloride – Phosphorus Removal
 - Liquid Polymers – Sludge Dewatering
 - Caustic Soda – Odor Control
 - Sodium Hypochlorite – Odor Control

Treatment Flow (where 'it' happens)



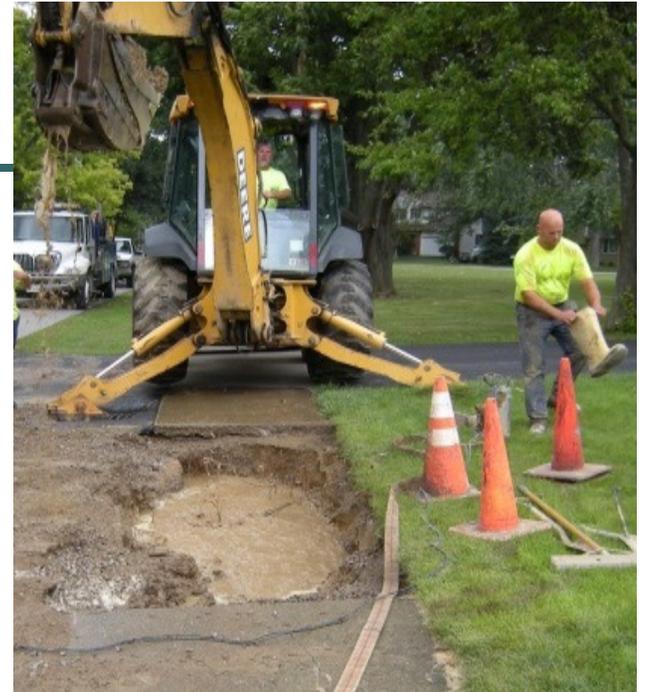
• **Sludge Disposal**



- **Sludge is solid matter produced in wastewater treatment.**
- **Anaerobic digestion of sludge into methane for conversion to electricity of natural gas.**
- **We produce about 7,000 wet tons of sludge a year.**
- **Since 2013, pay less for hauling, and save about \$70,000 a year.**

Water Distribution

- Fire hydrants, mains, service lines, valves, meters
- Hydrant flushing, flow testing
- Meter reading: 12,000 accounts
- 25-30 service requests per day
- Water main breaks
 - **Frigid weather** – most common time, when air, water temps can contribute to breaks.
 - **Hot, dry weather** – Shifting ground, increased volume and pressure can stress water mains



Wastewater Collection

- Closed Circuit TV Inspection
- Manhole repair/replacement
- OUPS locates
- Sewer cleaning
- Sewer lines, mains, laterals
- Pump station maintenance



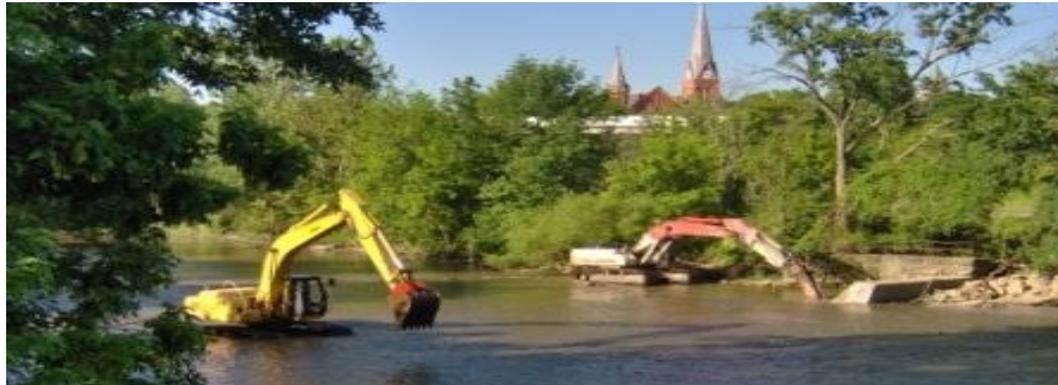
Storm Sewer

- Catch basin, storm sewers
- Manhole repair/replacement
- OUPS locates
- Catch basin cleaning
- TV inspections



Watershed Management

- Upper Olentangy River Watershed – 430 square miles in portions of 5 Counties
- Promote ‘Best Management Practices’
- “Don’t Pollute/Drains to Streams”
- ODNR Litter Clean-up Grants



Budgets

- **Water Fund Revenue = \$5,438,372**
- **Water Fund Expenditures = \$6,111,003**
(Treatment, chemicals, electric = \$1,913,053)
- **Sewer Fund Revenue = \$6,767,763**
- **Sewer Fund Expenditures = \$7,093,125**
(Treatment = \$1,909,568)
- **Storm Sewer Revenue = \$827,000**
- **Storm Sewer Expenditures = \$2,294,169**

Public Utilities Projects

- Top-10 since 2010: \$40 million total cost
- Most recent:
 - Water Plant Improvements - \$30.5 Million
 - Sawmill Parkway/Innovation Court Water and Sewer Extensions - \$275,000
 - Blue Limestone Park Improvements - \$300,000



Upcoming Projects

- **Water**

- Vernon Avenue 8" water line - \$175,000 (2016)
- Advanced Meter Infrastructure System - \$1,500,000 (2016)
- 500 MG Reservoir - \$18,000,000 (2022)

- **Sewer**

- Aeration System - \$950,000 (2016)

- **Storm Water**

- Bernard Avenue - \$900,000 (2016)

Service Area Agreements

- Water Service agreement with DEL-CO Water Company.
- Sanitary Sewer agreement with Delaware County.