Aquarius Water Plant

March 5, 2014

Jay Spetrino, Superintendent


OUNTY OF LAKE, OHIO
TER TREATMENT PLANT

History

- Construction of the Treatment Plant began in February of 1982. The plant became operational and began producing finished water on January 1, 1985.
- Original project cost was $28,000,000
- Prior to the completion of the Treatment Plant, western Lake County communities received their water supply from the City of Cleveland, the City of Willoughby, Aqua Ohio Water Service and private wells.
- The plant currently provides water for over 90,000 residents in seven western Lake County Communities.

Electrical System

Three 350 KW diesel generators provide standby power.

Uninterruptible Power Supply (U.P.S.)

Provides general plant lighting for approximately 30 minutes in the event of a utility power failure.

Raw Water Intake

- Lake Erie is the raw water supply
- The raw water intake crib is located at a 30 ft depth and approximately 3,100 feet from shore.
- Raw water is collected through four intake inlets, which then converge into a 60-inch diameter intake pipe
- Capacity is 36 million gallons per day.
- 36-inch diameter, 4,000 foot raw transmission main.

Raw Water Station

Traveling Water Screens

Dosed with potassium permanganate

Raw Water Pumps

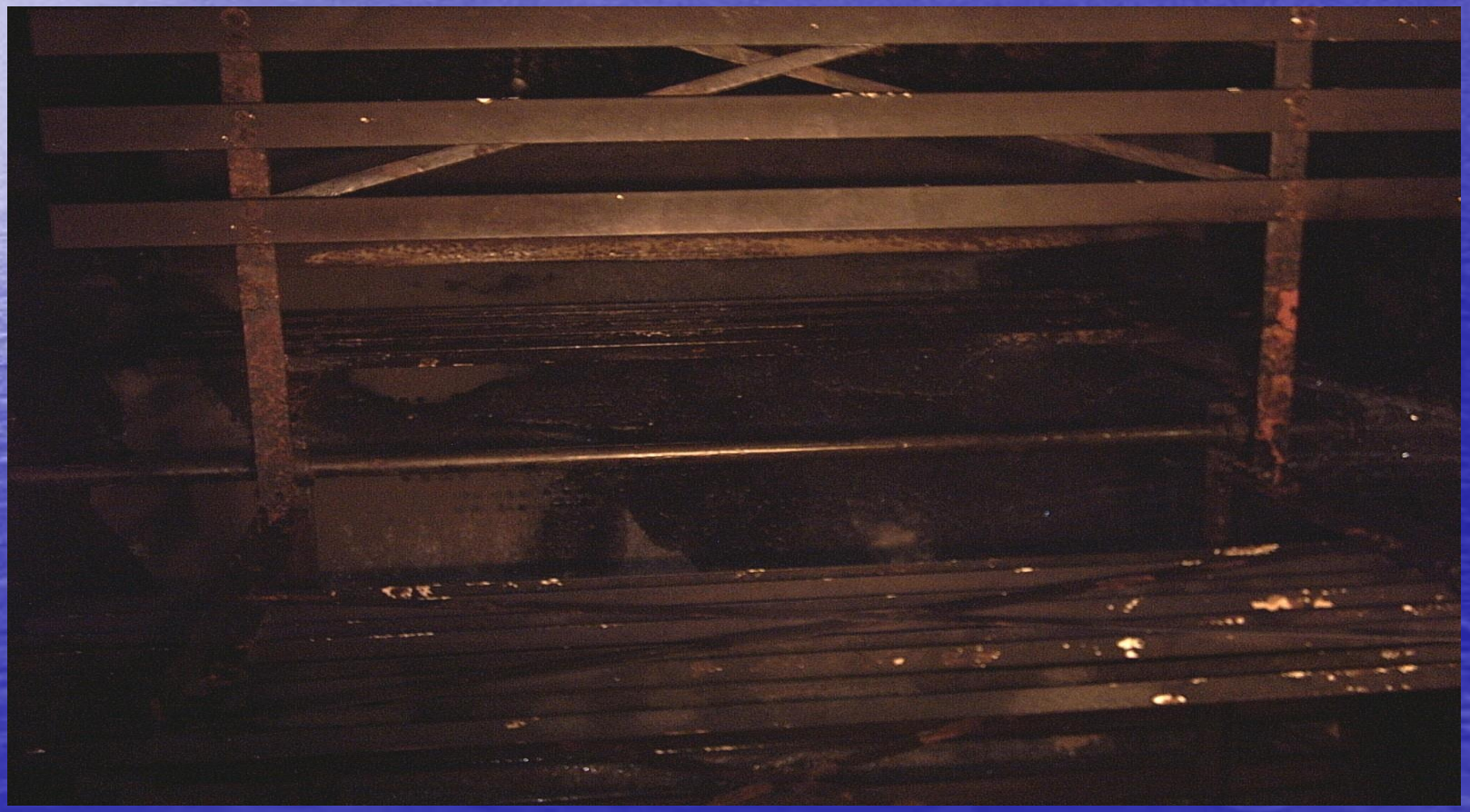
Five vertical turbine pumps, with a total capacity of 35 million gallons per day

Rapid Mix Tank

- Coagulant and Activated Carbon are added and agitated.
- Caustic Soda, Sodium Hypochlorite and Coagulant Aids may also be added if needed.

Flocculation Tanks

- Six 105,000 gallon tanks
- Variable speed redwood paddles provide gentle mixing to insure complete chemical reactions.



Flocculation Tanks

Sedimentation Basins

- Four 845,000 gallon settling basins.
- The water is then transported to the filters via the concrete settled water flume.

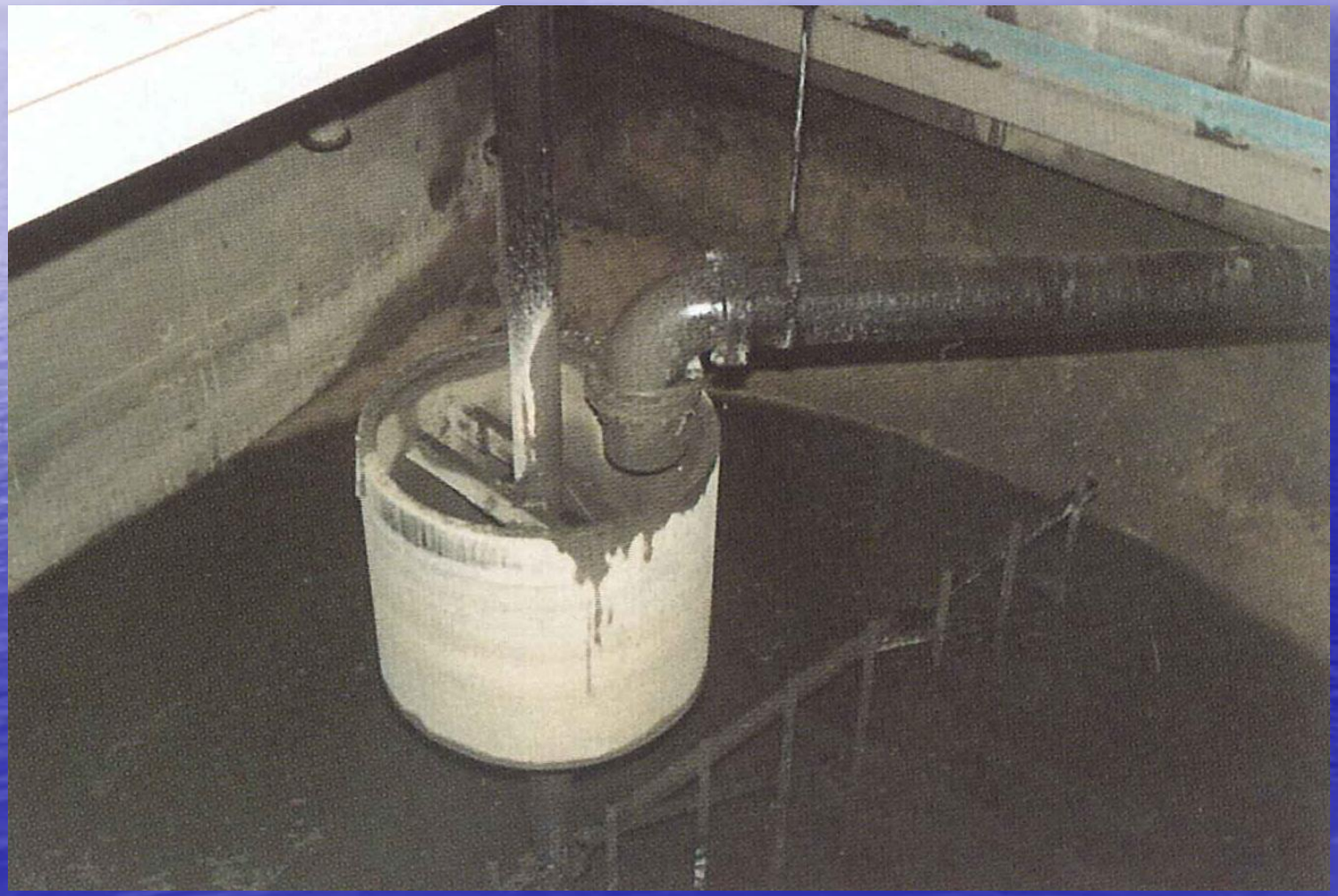
Sedimentation Basins

- The sludge is moved with flight collectors.
- Removed through a telescoping valve.
- The sludge flows through a flume and into the thickeners.

Sedimentation Basin Cleaning

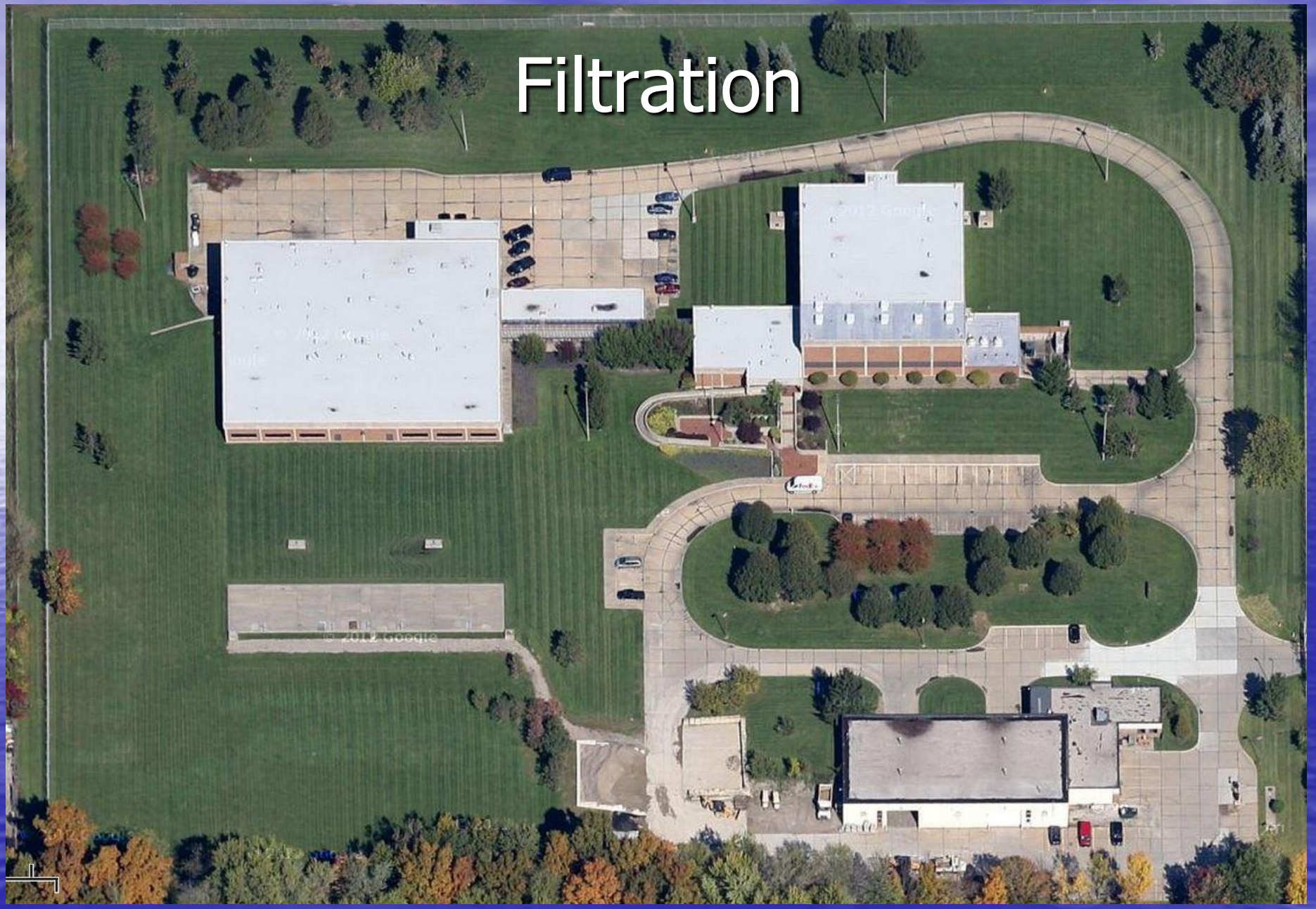
Sludge Thickener

- Two 60,000 gallon sludge thickeners.
- Sludge is pushed to the center by a rake.




82U
Lake County
Lake
Department of Utilities

Filtration



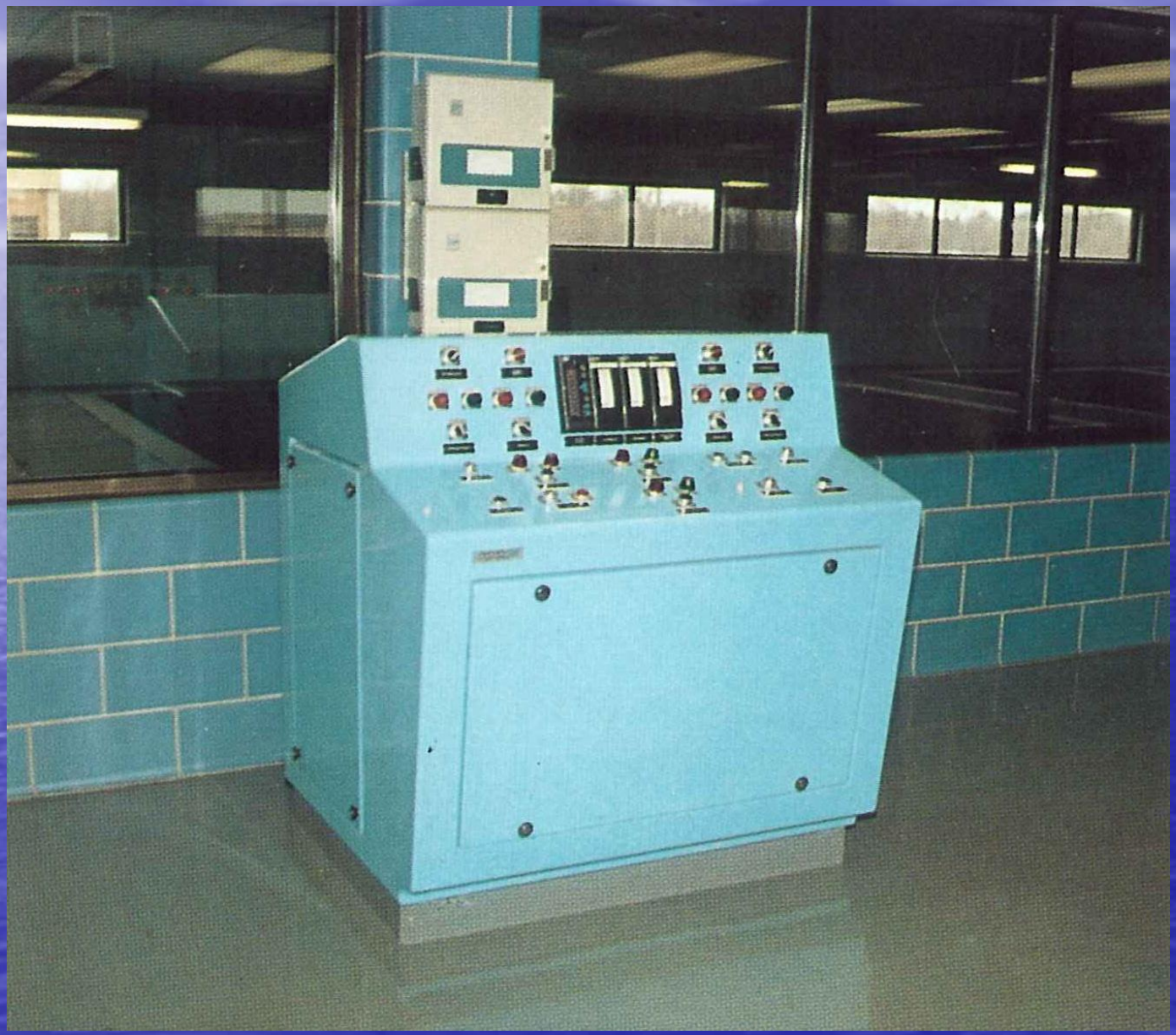
Filtration

- Two 42 inch steel pipes carry settled water to the filter building
- Chemical application points in the flume allow Activated Carbon or a Filtration Aid to be added prior to filtration when needed.
- Fluoride and Sodium Hypochlorite are added prior to filtration.
- Sodium Hypochlorite is added after filtration.
- Six double cell high rate filters are automatically controlled by (SCADA)

Filter Control Consoles

Filter Washing

- Each filter cell contains three surface agitators
- Filters are washed every 120 hours or 9.375 MG
- 150,000 gallons per wash
- Water is supplied from the clear well



Finished Water Storage

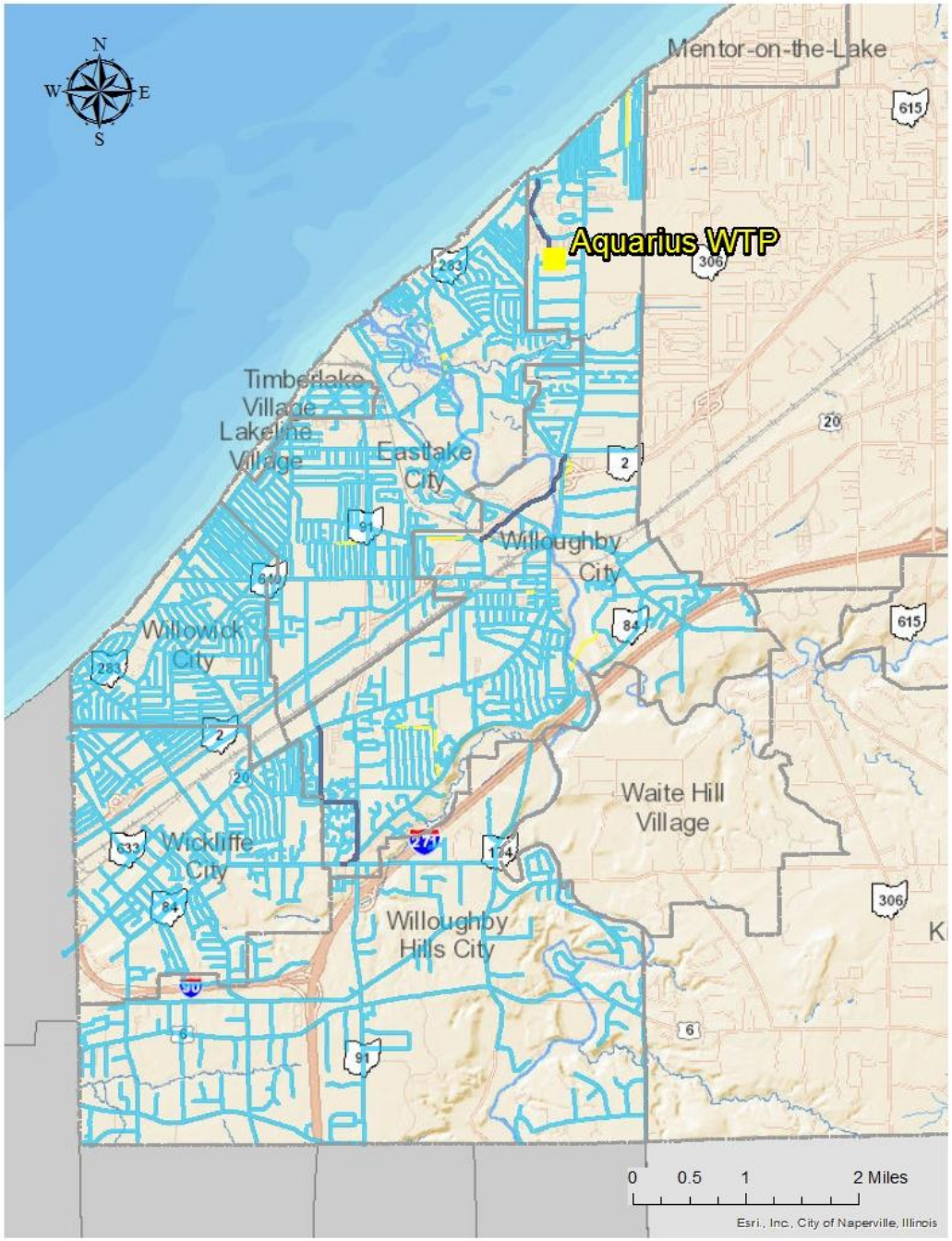
- Water is stored in two 585,000 gallon clear wells.
- Water flows to two pump well chambers totaling 480,000 gallons.
- Zinc-orthophosphate is fed at the influent of the pump chamber.
- Sodium Hypochlorite can be fed at the influent of the pump chamber.
- Water is drawn from these wells and pumped out to the distribution system.

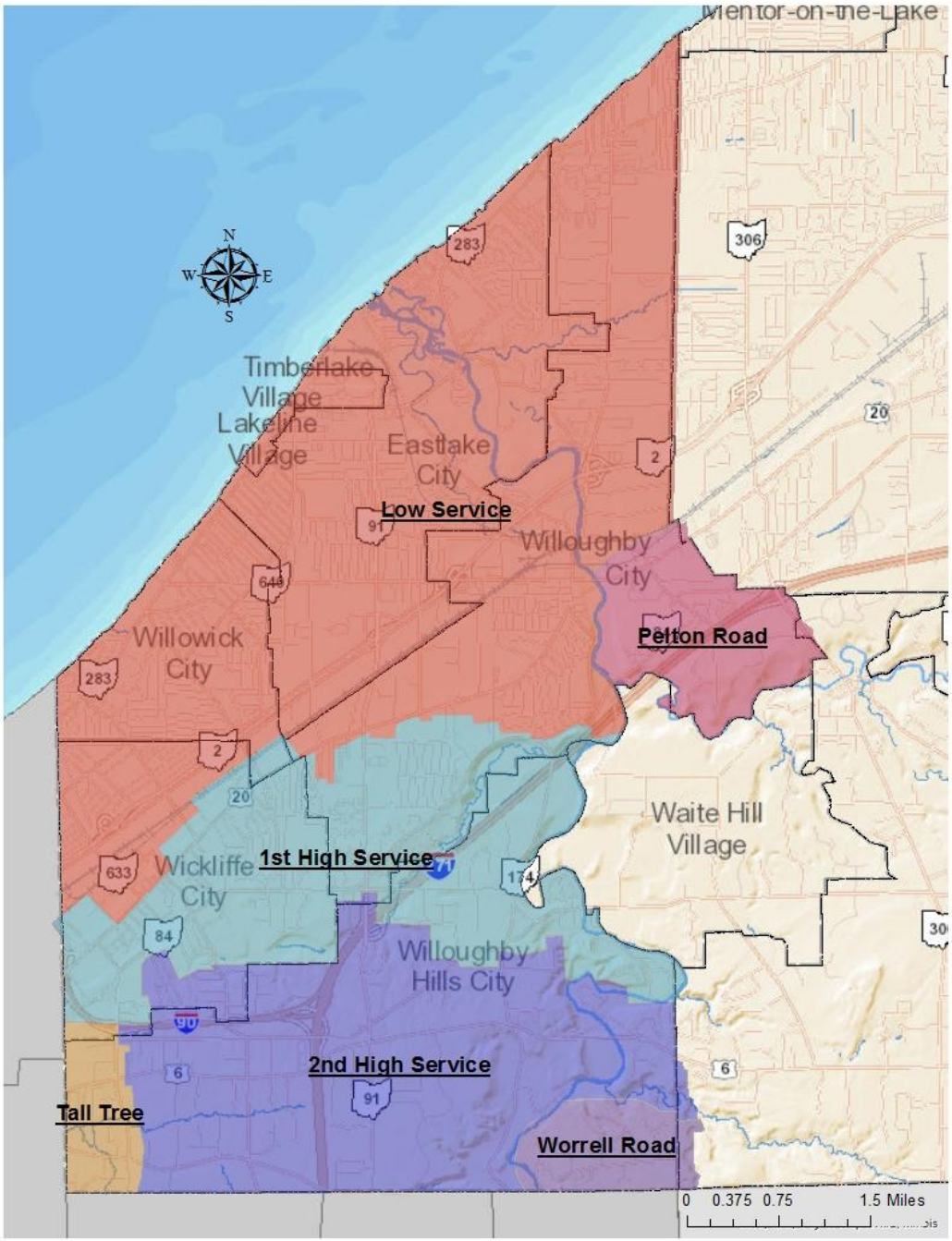
High Service Pump

Five vertical turbine pumps.

- Pump Number 1 - 4.33 MGD
- Pump Number 2 - 4.33 MGD
- Pump Number 3- 8.64 MGD (VFD)
- Pump Number 4- Future Expansion
- Pump Number 5- 8.64 MGD
- Pump Number 6- 8.64 MGD (VFD)


1840
Lake


N
W
E
S
Mentor-on-the-Lake
Aquarius WTP
Timberlake Village
Lakeline Village
Eastlake City
Willoughby City
Willowick City
Waite Hill Village
Wickliffe City
Willoughby Hills City
615
306
283
20
2
91
84
174
633
6
0 0.5 1 2 Miles
Esri, Inc., City of Naperville, Illinois


Mentor-on-the-Lake
N
W
E
S
Timberlake Village
Lakeline Village
Eastlake City
Low Service
Willoughby City
Pelton Road
Willowick City
Waite Hill Village
1st High Service
Wickliffe City
Willoughby Hills City
2nd High Service
Tall Tree
Worrell Road
0 0.375 0.75 1.5 Miles

Plant Data

2013 DAILY AVERAGE

- Treated Water Flow – 8.837 MGD
- Raw Turbidity – 14.5 ntu
- Production Water Flow – 8.777 MGD
- Tap Turbidity – 0.08 ntu
- Tap Alkalinity – 86 mg/l
- Tap Hardness – 123 mg/l
- Tap pH – 7.4
- Tap Chlorine Residual – 1.9 mg/l

Plant Improvements

- Chlorine gas to sodium hypochlorite
- Laboratory upgrade
- Variable speed drives
- Filter replacements (2014)

ANNUNCIATOR

Total Raw Flow Totalizer

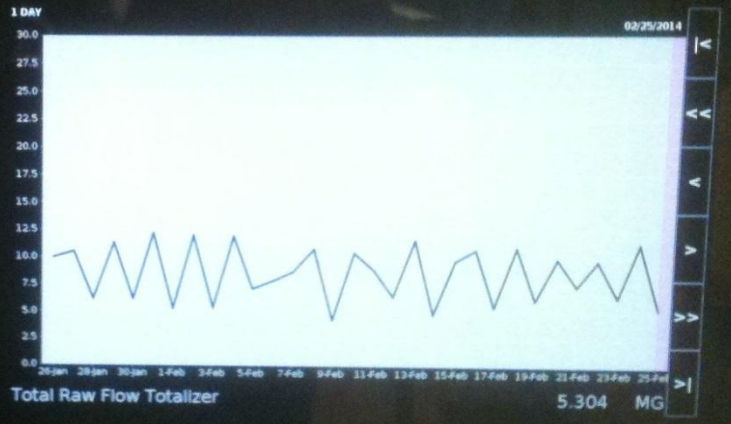
2/26/14 9:18:59 AM

home

3.7 MG Since Midnight

Daily Totals

02/20/2014	9.904	MG
02/21/2014	7.376	MG
02/22/2014	9.685	MG
02/23/2014	6.366	MG
02/24/2014	11.266	MG
02/25/2014	5.304	MG



cxxi log21

acer


CL2
CL3
EAST CL2
SCALE 1
CL 1


Lake County
Lake
Department of Utilities

ANY QUESTIONS??

Information

If you have any other questions or would like an onsite tour of our facility you can contact me at 440.918.3420
or
john.spetrino@lakecountyohio.gov