Michigan's Water Quality Event

93rd Annual Conference
Boyne Mountain - 2018

Steve Aiken
Regional Sales Manager
Presentation Represents:
• 33 Projects
• $106,280,761 Invested

All to improve Clean Water for the citizens of Michigan
CITY OF MOUNT CLEMENS

FEASIBILITY STUDY TO ASSESS
TERTIARY FILTER
UPGRADE/REPLACEMENT
TECHNOLOGY OPTIONS
7 filter technology options were assessed to provide the most cost effective long term operational performance & lowest long term O&M cost for the City to replace their existing Traveling Bridge tertiary filter and to provide the necessary firm capacity for plant operations.

1 option analyzed a new synthetic compressible filter media technology (FiltraFast) by SUEZ. This option also included the installation of a pilot plant at the wastewater plant to provide filter performance data at various high flow filtration rates.

The pilot filter plant consisted of:

- a filter chamber
- backwash tank
- backwash pump
- air scour blower
- influent pump
- system controls
- composite samplers
The pilot plant was operated for 30 days at filtration rates of: 20, 30, & 40 GPM per SF of filter surface.

Influent & effluent turbidity of the pilot plant flow were measured & recorded at regular intervals.

24 hour composite samples were collected for testing of CBOD, TP & TSS.

Results from the pilot study were compared with costs and performance benefits of 6 other technology alternatives ranging from Disk to Traveling Bridge Filters.

While not initially the cheapest alternative related to capital cost, study conclusions pointed out that the FiltraFast system provided the greatest flexibility to handle solids loading.

For more study information, please contact Greg Gucwa, P.E., at Johnson & Anderson, Inc.
COOK NUCLEAR WWTP: FILTERS

- AEP Donald C. Cook Nuclear Plant, Sanitary WWTP (Bridgman, Michigan)
- Tertiary filter replacement project
- Completed 2017 by IAI’s Engineering/Tech Services & Mechanical Services Divisions, with American Electric Power
- $453,450 Project Value
REMOVAL OF OLD EQUIPMENT
NEW EQUIPMENT INSTALLED
SCIO TOWNSHIP JACKSON ROAD PUMP STATION IMPROVEMENTS

Oxygen Injection System for Odor Control
**OXGENATION INJECTION SYSTEM**

- **Goal:** Reduce Likelihood of Hydrogen Sulfide Formation at force main outfall

- **Solution:** Construct a superoxygenation system at the sanitary sewer pump station.

- **How it works:** Pump a side-stream portion of the raw sewage through a downflow bubble contactor allowing for an oxygen transfer efficiency of ~93%.
SITE IMPROVEMENTS

- ~ 230 square foot building addition
- 3,000 gallon Liquid Oxygen System
- Provide consistent oxygen supply in the wastewater stream prior to entering the force main to reduce likelihood of hydrogen sulfide formation
NEWS FROM THE FIELD 2018

FISHBECK, THOMPSON, CARR & HUBER, INC.
IONIA WRKF Ongoing Improvements

- Two 65-foot-diameter secondary clarifier mechanisms and eight sump pumps replaced in fall 2017
- Project Cost: $447,311
- More than 170 sludge valves and 10 sludge pumps to be replaced in 2018
Tyson Foods, Zeeland

- Influent wastewater screen building
- Internally fed rotary drum screen
- Screenings conveyor
- 2,500-gpm capacity
- Construction planned for 2018
Lake Odessa/Lakewood WW Authority

- 8,000 feet of watermain
- 6,100 feet of sanitary sewer
- 8,500 feet of road reconstruction
- Work completed fall 2017
Lakewood WW Authority

- Pump Station No. 9 replacement
- Duplex submersible grinder station
- 80-gpm firm capacity
- Construction completed 2017
Coldwater BPU WRRF EQ Facility

- Headworks: 5.5 MGD
- EQ Basin: 1 MG total capacity
  - 500,000 gallons/tank
- EQ design flow 700 gpm (1 MGD)
- Operation
  - Winter mode
  - Summer mode
Coldwater BPU WRRF EQ Facility

- Flow control
  - Storms
  - Accidental discharge/releases
- Buffer loadings
  - Mix
  - Homogenize
- Isolation
  - Detention
  - Slow feed/blending
Coldwater BPU WRRF EQ Facility
Genesee County Drain Commissioner
District # 3 WRRF - Primary Clarifier Asset Management Upgrades
HUBBELL, ROTH & CLARK
NEWS FROM THE FIELD

MWEA 2018
Annual Conference
City of Petoskey
WWTP Improvements
City of Petoskey
Bear River East Lift Station Replacement

Generator Here
South Huron Valley Sewer Authority
Aeration Tank Retrofit and Upgrade
Delhi Township
Eifert Road Force Main Replacement

PVC Air Release Chamber
Joint Fusion
Internal Debead
Delhi Township
Nitrification Tower Media Removal and Replacement

Removal of Existing Media

Crack Pressure Grouting

Joint Liner
City of Grand Rapids
Market Ave Concentrated Waste Force Main

Entrance to Plaster Creek Installation

Final Installation at Plaster Creek

FM Along 84” Major City Trunk Sewer
City of Grand Rapids
Eagle Crest Force Main Replacement

Directional Drilling Operation

HDPE Fusing
Genoa Township
Lake Edgewood Equalization Basins

Existing Concrete Tanks Repurposed to New Equalization Basin

New Equalization Piping and Transfer Pumps from EQ Tanks
Oakland County Water Resources Commissioner
Quarton Road Relief Sewer Project
City of Sterling Heights and City of Utica Clinton River Corridor Habitat Restoration
BENTON HARBOR - ST JOSEPH WASTEWATER TREATMENT PLANT

producing clean water for the environment
NEW HEADWORKS AND MISCELLANEOUS IMPROVEMENTS
ORIGINAL HEADWORKS UPGRADES
2017-2018
Construction Jobs

Moore & Bruggink

- Grandville UV
- Charlotte Grit
- Holland PBW Lift Stations
Grandville CWP UV Improvements

Old control cabinets and “cooling system” located within the 100-yr floodplain

Drone photo of building addition
Grandville CWP UV Improvements

New building addition to place new cabinets above the 100-yr flood plain.

New building ventilation system and air compressor for pneumatic UV lamp cleaning system.
Charlotte WWTP Grit System Improvements

Before

After
Holland BPW
Highland Ave & 18th St
Lift Stations Improvements
1. Line 1 is the settling flux curve. While Line 2 is the design flux curve that has a safety factor derating from ideal conditions.

2. Line 3 the thick blue line is the peak or in our case the MM flow conditions flux line. The slope of the blue line is affected by the system RAS rate while the height of Line 2 is set by the system SVI. The lower the SVI the higher the peak hump in line 2. So the goal is to keep the blue dot under the line 2 and not have any part of the blue line to the right touch Line 2.

3. Line 4 is a dashed blue line and it represents average operation. So we design for Max month at the safety factor curve Line 2. Basically be under the thick brown curve line 2.

State Point Analysis
City of Wyoming Clean Water Plant Treatment Capacity Re-rating

Biowin Projections of MLSS Concentration at Various Influent BOD Loading

- Max treatable BOD load corresponding to available aeration capacity
- BOD load corresponding to solids loading rate = 35 ppd/sf
- BOD load corresponding to solids loading rate = 39 ppd/sf
- Existing BOD load and MLSS concentration
- Safety Factor
2017-2018 Projects

Battle Creek: Secondary System Improvements
Niles: RAS Improvements
Coldwater: SCADA Upgrade
Battle Creek: Secondary System Improvements Before Construction

West Plant Centrifugal Blower

East Plant Blower Building

Chemical Feed Equipment

East Plant PD Blowers
Battle Creek: Secondary System Improvements During Construction - New Final Clarifier Flow Meters
Battle Creek: Secondary System Improvements During Construction – East Blower Building Electrical and New Blowers

- New Switch Gear
- New High Efficiency Blowers
- New MCC
- New Chemical Feed Systems
Battle Creek: Secondary System Improvements During Construction
Niles: RAS Improvements
Before Construction
Niles: RAS Improvements During Construction
Niles: RAS Improvements
Completed Project
Coldwater: SCADA Upgrade
Overall System Diagram
Coldwater: SCADA Upgrade
EQ Basin
Coldwater: SCADA Upgrade
Water System
Biodigestion with Combined Heat and Power
Grand Rapids Water Resource Recovery Facility

Engineer: Tetra Tech • 517.316.3940 • www.tetratech.com
Contractor: Christman Construction
Biodigestion with Combined Heat and Power
Grand Rapids Water Resource Recovery Facility

Ground Breaking Event
Biodigestion with Combined Heat and Power
Grand Rapids Water Resource Recovery Facility

Site Excavation and Ground Improvements
Biodigestion with Combined Heat and Power
Grand Rapids Water Resource Recovery Facility

Biodigester Complex Site Plan Rendering
Headworks and Interceptor Improvements
East Lansing Water Resource Recovery Facility

Engineer: Tetra Tech • 517.316.3940 • www.tetratech.com
Contractor: Christman Construction

New Headworks Building Rendering
Headworks and Interceptor Improvements
East Lansing Water Resource Recovery Facility

60-inch Sewer Lining
Headworks and Interceptor Improvements
East Lansing Water Resource Recovery Facility

Headworks Building Wetwell Base Slab

WRRF Influent Forcemains
Wastewater Treatment Plant Expansion
Genoa Oceola Sewer and Water Authority

Engineer: Tetra Tech • 517.316.3940 • www.tetratech.com
Contractor: Davis Construction
Wastewater Treatment Plant Expansion
Genoa Oceola Sewer and Water Authority

Existing Oxidation Ditch and Process Building

Exisiting Oxidation Ditch
Odor Control Improvements
City of Saline, Michigan

Engineer: Tetra Tech • 517.316.3940 • www.tetratech.com
Contractor: E&L Construction

Existing RBC Facilities

Existing Covered Clarifier
THANK YOU

Benton Harbor St Joseph Authority
City of Grand Rapids
Black & Veatch
Hubble Roth & Clark
City of South Haven
Prein & Newhof
City of Roosevelt Park
City of Saline
City of Mount Clemens
Johnson and Anderson
Infrastructure Alternatives
Cook Nuclear Facility
Ionia
Tyson Foods
City of Petoskey
City of Sterling Heights

Fishbeck Thompson Carr & Huber
City of Coldwater
Lakewood Wastewater Authority
Lake Odesa
Moore & Bruggink
City of Zeeland
Delhi Township
Donahue
City of Wyoming
OHM
City of Niles
Tetra Tech
Scio Township
Genesee County
Oakland County Water Resources Commissioner