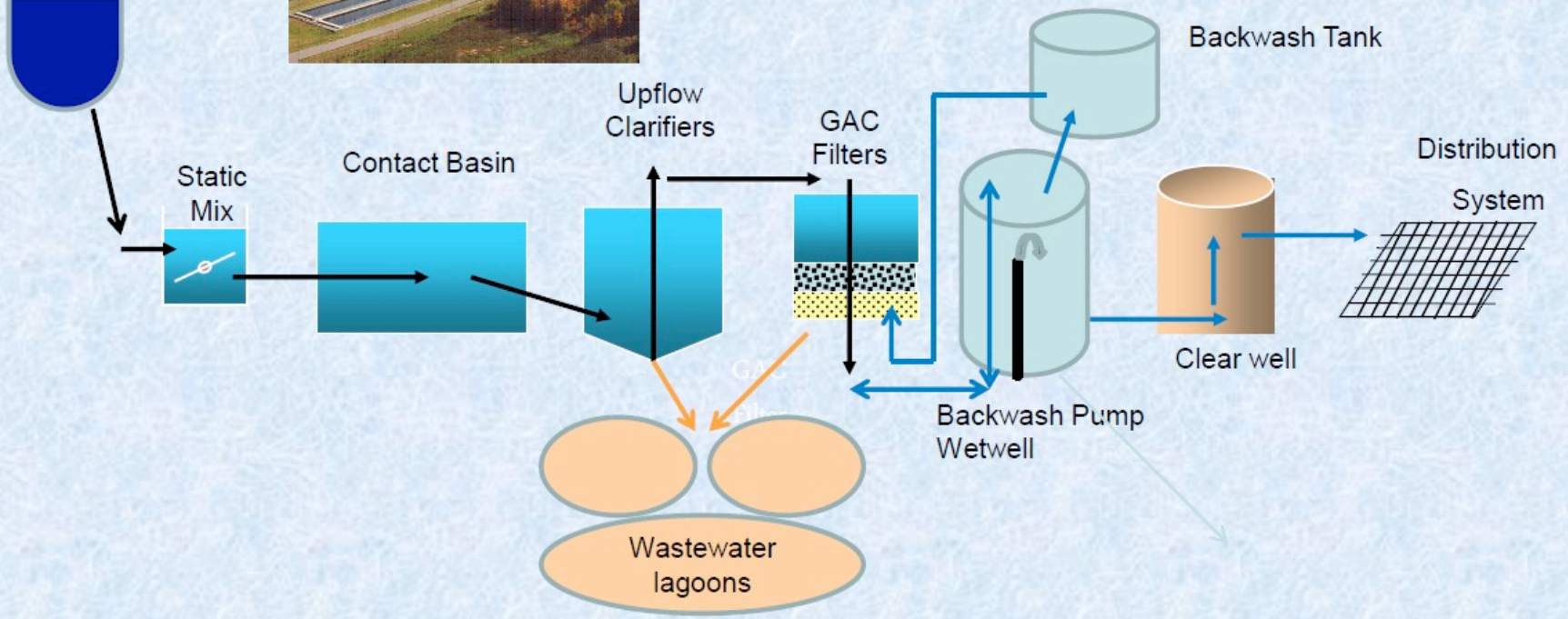
Hinckley Water Treatment Plant

Optimizing and Expanding Technology for a Sustainable Future:

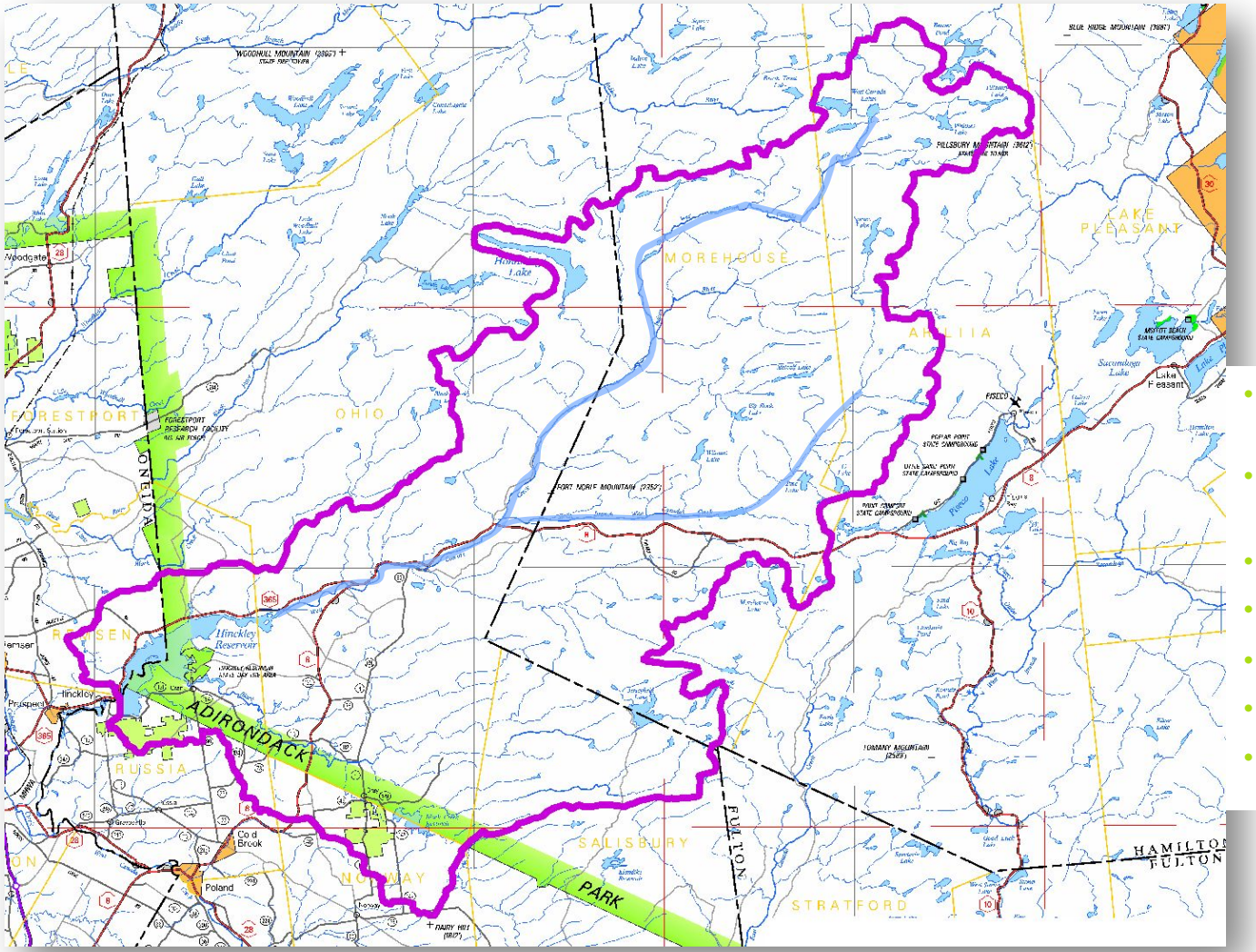
Following the SUEZ-Mohawk Valley Water Authority Partnership

Hinckley Filtration Plant



- **Hinckley Reservoir- Sodium Permanganate added only if raw water Mn levels reach 0.05 mg/l**
- **Rapid Mix – Alum added (polymer added on an as needed basis)**
- **Contact Basin – One hour contact time allows for chemical reaction (coagulation and flocculation)**
- **Upflow Clarifiers – Polymer added, water flows up through a plastic media – coagulated particles are trapped on the media (99% of particles removed here). Backwash uses process water**
- **Mixed Media Filters – 63 inches of GAC over gravel. Backwash utilizes water from the backwash tank**
- **Clear Well - Chlorine added here for disinfection, 1 hour contact time. Lime and soda ash added for corrosion control, fluoridation.**
- **Backwash – polymer added to aid settling in lagoons**

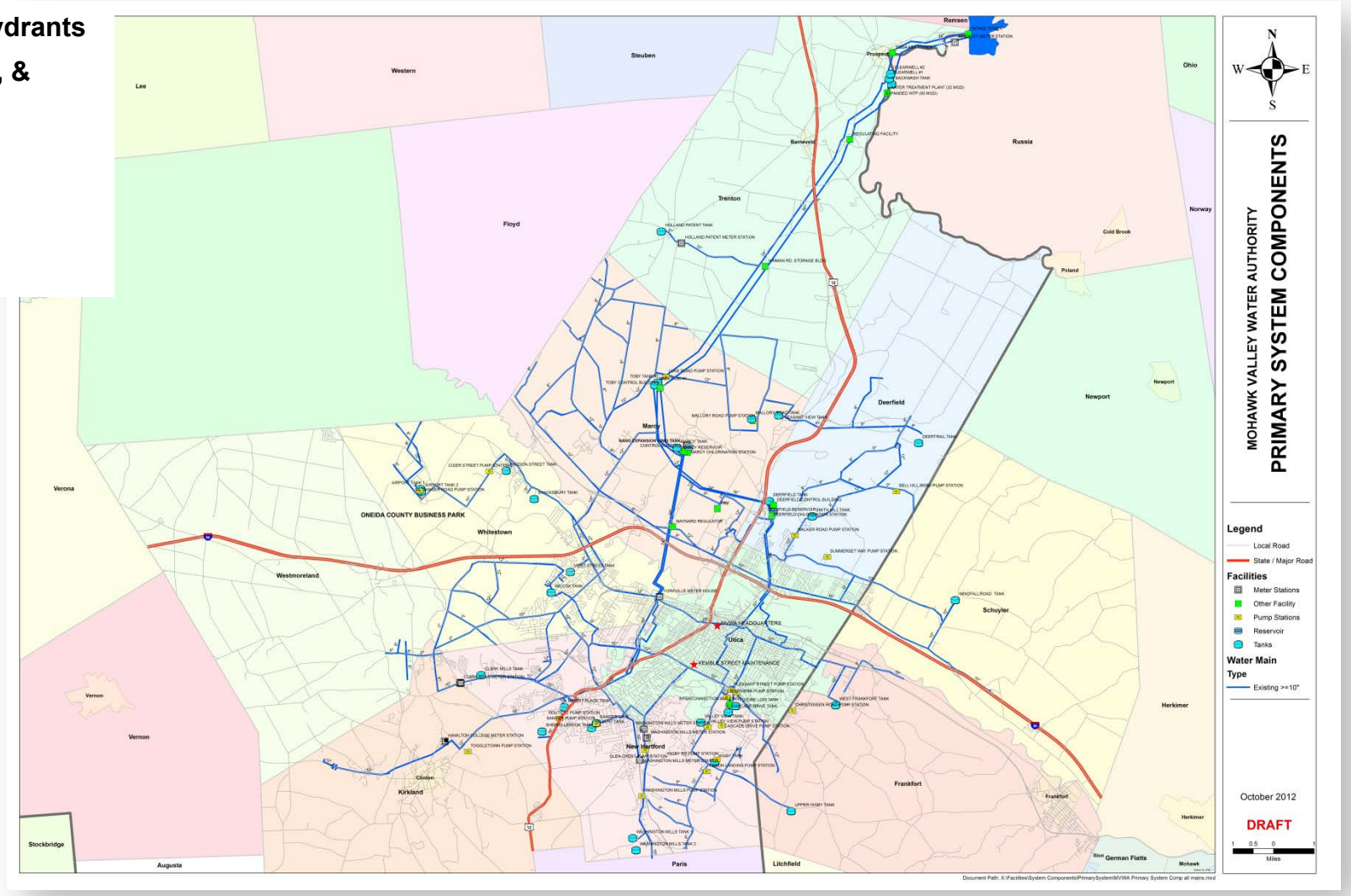
Hinckley Reservoir Watershed



- **374 square mile Adirondack Watershed (APA), Water Rights in 1900**
- **25 Billion Gallon Hinckley Reservoir (Canals), 1915 – Eminent Domain - Litigation**
- **WTP Capacity: 32 MGD, 1992**
- **Water Supply Permit: 48.5 MGD**
- **Withdrawal: +/- 19 MGD**
- **Production: +/-18 MGD**
- **Population: +/- 130,000**

Distribution System

- **700 Miles of Main, 13,500 Valves, 4,000 Hydrants**
- **60 Major Facilities, Tanks, Pump Stations, & Regulating Stations, 20 Buildings**
- **24 Service Zones, (Pressure)**
- **40,000 Accounts, 130,000 Pop. Served**
- **90 Employees, 5 Maintenance Crews**



PROJECT

Why we treat water

Raw vs. Finished

PROJECT

SUEZ entered into an agreement with the Mohawk Valley Water Authority on August 1st of 2017

This is a 5 year contract with 3 additional 5 year renewals

The Scope of the project is the Treatment Plant, intake facility at the reservoir, pre-soda ash silo and downstream turbine building

Staff of 7 – PM, APM, Senior Mechanic, 4 Operators

SAFETY PROGRAM ACCOMPLISMENTS

Developed a SUEZ 24-HR Incident Reporting and Response Line

Implemented Emergency Chemical Safety Procedures

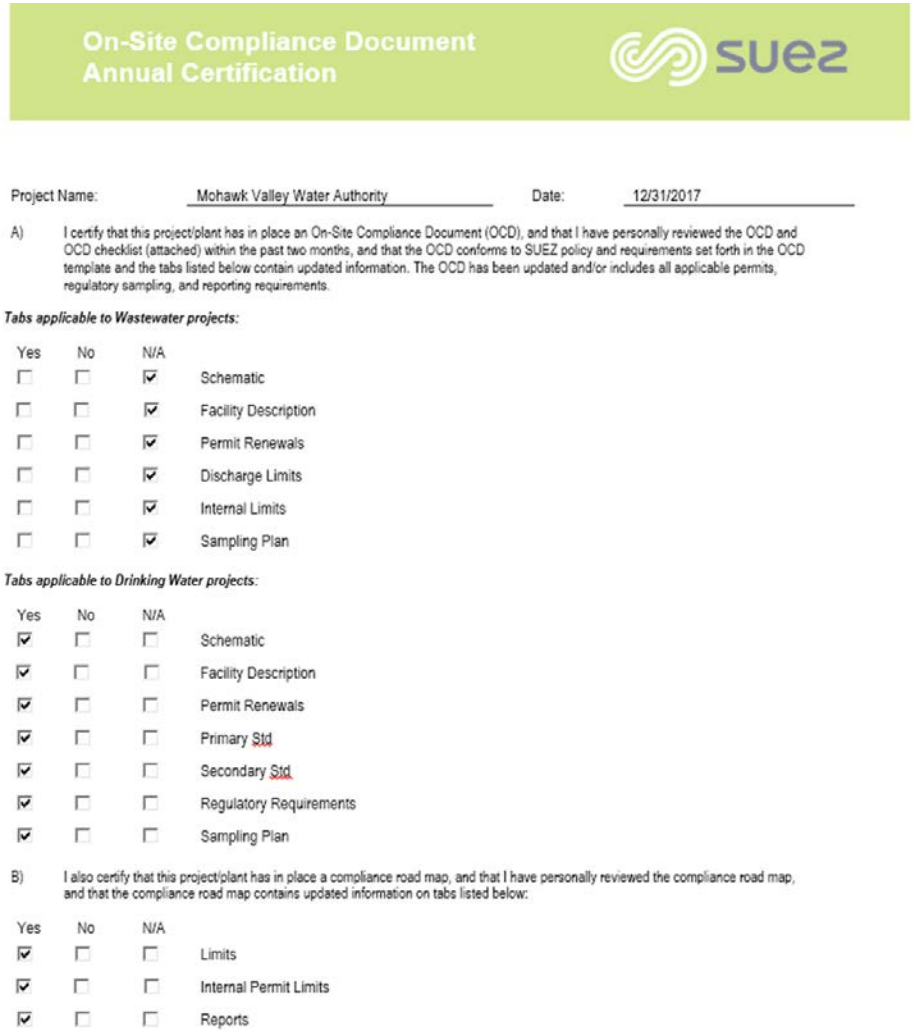
Created an Emergency Response Plan

Developed an EHS Training Program

Identified various unsafe conditions and work practices

Integrated a Safe Work Planning Process

ENVIRONMENTAL AND REGULATORY COMPLIANCE



On-Site Compliance Document
Annual Certification

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Project Name: Mohawk Valley Water Authority Date: 12/31/2017

A) I certify that this project/plant has in place an On-Site Compliance Document (OCD), and that I have personally reviewed the OCD and OCD checklist (attached) within the past two months, and that the OCD conforms to SUEZ policy and requirements set forth in the OCD template and the tabs listed below contain updated information. The OCD has been updated and/or includes all applicable permits, regulatory sampling, and reporting requirements.

Tabs applicable to Wastewater projects:

Yes	No	N/A	
☐	☐	☑	Schematic
☐	☐	☑	Facility Description
☐	☐	☑	Permit Renewals
☐	☐	☑	Discharge Limits
☐	☐	☑	Internal Limits
☐	☐	☑	Sampling Plan

Tabs applicable to Drinking Water projects:

Yes	No	N/A	
☑	☐	☐	Schematic
☑	☐	☐	Facility Description
☑	☐	☐	Permit Renewals
☑	☐	☐	Primary Std
☑	☐	☐	Secondary Std
☑	☐	☐	Regulatory Requirements
☑	☐	☐	Sampling Plan

B) I also certify that this project/plant has in place a compliance road map, and that I have personally reviewed the compliance road map, and that the compliance road map contains updated information on tabs listed below:

Yes	No	N/A	
☑	☐	☐	Limits
☑	☐	☐	Internal Permit Limits
☑	☐	☐	Reports

- Developed a series On-Site Compliance Documents (OCD)
- Mapped all regulatory requirements and developed a schedule
- Identified key compliance issue with State of New York UST regulations
- Initiated the use of HACH WIMS and LabCal
- Completed laboratory audit and developed SOPs as per standard methods
- Performed extensive training on systems and procedures

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ASSET MANAGEMENT

eRPortal/Llumin Computerized Maintenance Management System (CMMS) installed:

- New total of 835 assets were identified
- 420 Preventative & Predictive Maintenance Strategies were developed
- Critical Spare part inventory was created

Baseline equipment condition assessment conducted:

- 97% of assets scored in good or very good condition
- Currently calculating condition-based life & estimated replacement costs
- Risk workshop was conducted with Phil Tangorra and project staff

Currently:

- CMMS Training and “Go Live”
- Finalize Condition Assessment Report
- Develop Risk and condition-based R&R/ Capital Improvement Schedule
- **Adjust PM schedules as data validates**

PROCESS OPTIMIZATION- PHASE 1 & 2

Jar Tests:

- Alum best performer over all PACIs

Clarifier Rinse Profiles:

- Adjusted flows and times
- 100,000 gpd savings

Filter Backwash Profiles:

- Possible 140,000 gallons/backwash savings

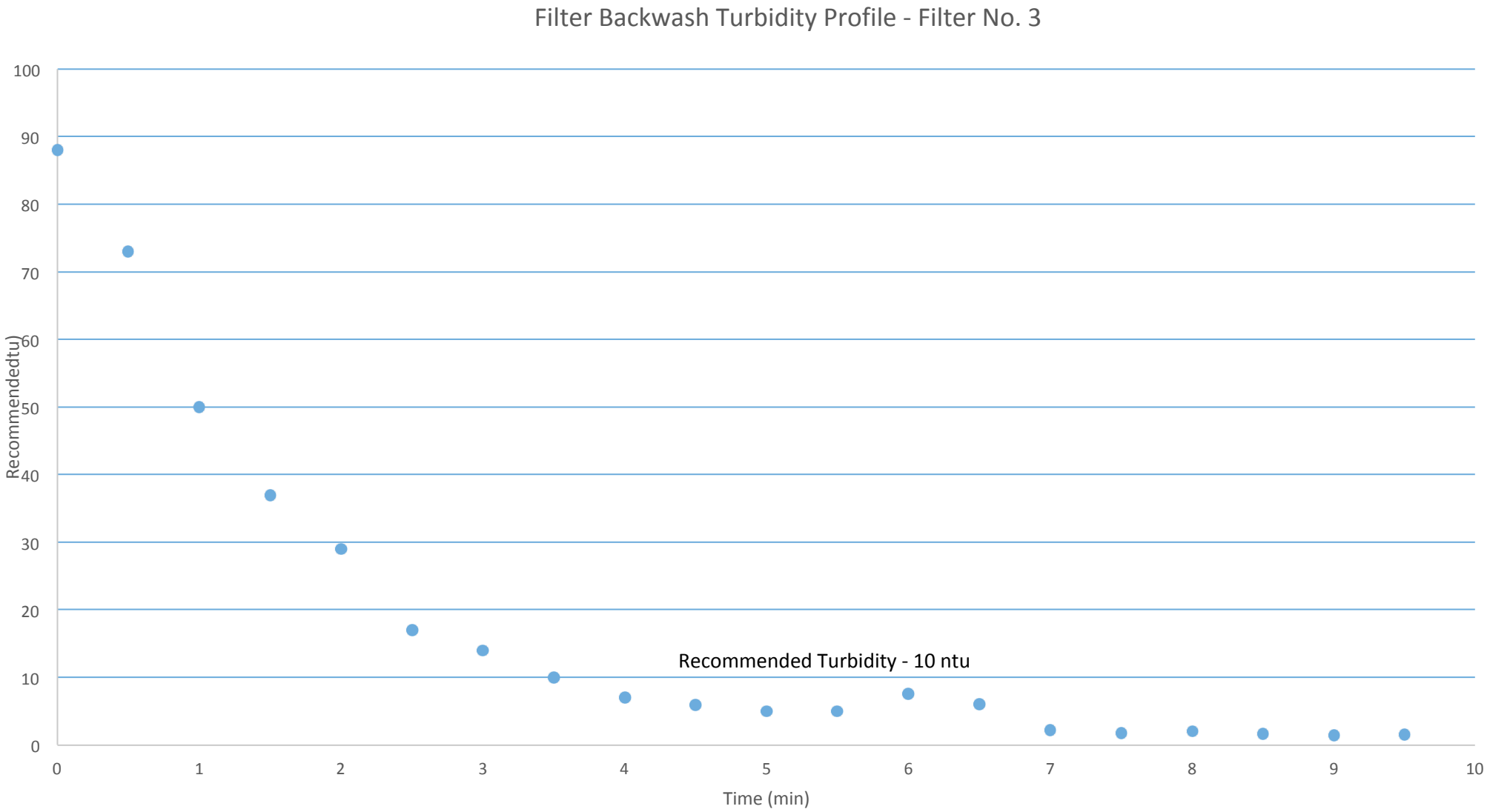
Hydroturbine Efficiency:

- Downstream - Slight decrease in efficiency
- Upstream - No decrease in efficiency

SOPs:

- 28 SOPs prepared
- 19 Process Control Guidelines (one for each unit process)

FILTER BACKWASH PROFILE



PROCESS OPTIMIZATION- PHASE 3

Carbon Regeneration:

- DOH approved use of regenerated carbon on April 27th, 2018
- Approx. saving of $350,000 per year

Beneficial Reuse of Sludge:

- Looking for taker
- Submitted DEC permit, pending approval
- Approx. savings of $190,000 per year

Future Possible Conversation on Orthophosphate:

- Waiting on new Pb/Cu Rule

Future Conversation on Hypochlorite

Net Metering for Hydro Turbines

Regenerated GAC – Objectives and Operating Conditions

Objectives:

- Evaluate whether regenerated GAC performs as well as virgin GAC:
  - TOC and UV254 removal, THM formation
- Evaluate whether regenerated GAC performs as well as virgin GAC as a filter media:
  - Turbidity performance, headloss development, unit filter run volume (UFRV)

Operating Conditions:

- Plant clarified water used as feed water to the pilot
- GAC depth was 60” (matches full-scale plant)
- Filter loading rate was 2.8 gpm/sf (equivalent to full-scale plant operating at 20 MGD)
- Unchlorinated water used for backwashing
- Backwash conditions:
  - Target 30% bed expansion (visual observation)
  - Monitor headloss and filtered water turbidity

Regenerated GAC Conclusions

The PPFs all performed similarly:

- TOC
- UV254 Removal
- SDSTHM Formation
- Turbidity
- Differential Headloss
- UFRV

Prepared Report to OCDOH/NYSDOH:

- Approved to use regenerated GAC
- Other utilities (e.g. Onondaga County Water Authority) have approval for use

PLANT UPGRADES

Soda Ash “Chunk Buster”:

- Cost to build appox. $2,830 vs $50,000 to purchase
- Built in-house, currently working on version 3.0

Chemical Delivery Horse:

- An in-house safety fix for Alum and Fluoride deliveries

Gate Upgrade:

- Changed out a broken callbox for a digital system with remote video and audio access

Maintenance:

- Implemented oil analytics to determine needs for oil changes in mechanical equipment
- Purchased a Grease Caddy to pinpoint greasing needs

MVWA Chlorine Gas Conversion

MVWA/SUEZ are assessing chlorination alternatives:

Gaseous Chlorine (currently used):

- Safety Concerns: handling, potential releases, etc.
- Documentation required: Risk Management Plan (RMP)

Hypochlorite:

- Safer to handle
- Higher unit cost: 12.5% active/87.5% water, transportation costs

Onsite Hypochlorite Generation (OSG):

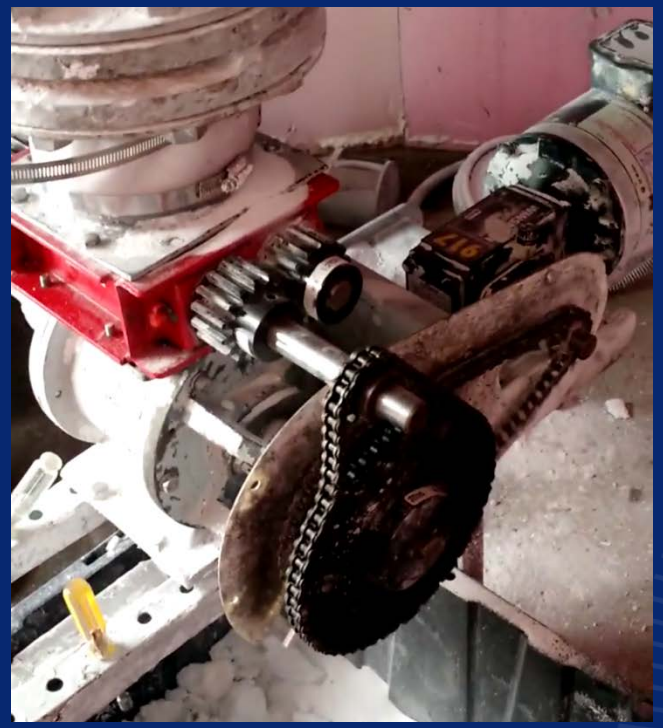
- Generated using brine (salt) using electricity
- Produces 0.8% hypochlorite
- Smaller footprint

Mixed Oxidants (MIOX):

- Generated using brine (salt) using a higher amount of electricity than OSG
- Produces 0.8% hypochlorite along with other oxidants, e.g., hydrogen peroxide

Onsite Hypochlorite Generation System

FRANK’S CHUNK BUSTER



OTHER UPGRADES

SUEZ IN THE COMMUNITY

- Partnered with Oneida County for an Internship program for college students
- Provide tours to local STEAM/STEM camps
- Provide tours to SUNY Polytech classes
- Attend Earth Day at the Utica Zoo
- Attend the Boilermaker Expo/Race

PLANT AWARDS

2018 SUEZ Innovation Award

- **Chunk Buster**

2018 SUEZ Inaugural Engineering Award in Overall Category

- **Plant upgrades**

2019 2nd Place NYSAWWA Top Ops Competition

2019 SUEZ Excellence in Maintenance

2019 Young Professional NYSAWWA

THANK YOU

QUESTIONS?