A Partnership for Success:
Partnership for Safe Water Program
Improves Water Quality and Operations

Barb Martin - Partnership for Safe Water,
Michael Barsotti – Champlain Water District
Thank You
New York Subscribers!

- Erie County Water Authority
- Metropolitan Water Board of Onondaga County
- Plainview Water District
- Village of Ossining
- Village of Waterloo
- City of Rochester
- City of Troy
- Monroe County Water Authority
- Onondaga County Water Authority
- Town of Queensbury
Thank You
New York Subscribers!

Directors Award Winners

• City of Rochester
• City of Troy
• Monroe County Water Authority
• Onondaga County Water Authority
• Town of Queensbury

New York utilities that will be recognized at ACE15 include – City of Rochester (Directors Award – Distribution), Town of Queensbury (Directors Award – Treatment), Monroe County Water Authority (5-Year Directors Award)
Why Optimize?

Water Quality and Operational Improvements

~

Ownership and Pride in Operational Activities
Why Optimize?

Long term performance improvement in turbidity and consistency of performance.
Why Optimize?

• Additional benefits:
  – Know your plant/system
  – Preparedness for extreme events and future regulations

• Improving performance has the potential to:
  – Improve water quality
  – Provide improved public health protection
  – Reduce operating costs

• Positive recognition through Partnership program

Representatives from Connecticut Water Company receive the 15-Year Directors Award at ACE14
Outline

• Partnership for Safe Water
  – Program mission and background
  – Program phases
  – Self-assessment process
  – Program impacts
Partnership for Safe Water

• Established in 1995 to address *Cryptosporidium* concerns

• Partner organizations:
Partnership for Safe Water

• Partnership for Safe Water mission:
  – *To improve the quality of drinking water delivered to customers by optimizing water system operations.*

• Two programs
  – Treatment plant optimization
  – Distribution system optimization
Partnership Subscribers

- Treatment Program
  - 245 Utilities
  - 452 Treatment plants
- Distribution Program
  - 150 Systems
- 40 States, DC, and 3 Canadian provinces represented
- 50% serve <100,000
- More than 20 new subscribers in 2014

Partnership Treatment utilities serve a combined population of more than 85 million

Partnership Distribution utilities serve a combined population of more than 38 million
“Beyond Regulations”

- Partnership for Safe Water subscribers strive to set and meet performance targets that go beyond regulatory requirements.
  - Additional level of public health protection
Treatment Program

• Open to surface water filtration plants of all sizes and configurations
  – Multiple barrier approach for turbidity reduction – <0.1 NTU
  – Optimize all unit processes for particulate removal
  – Conventional, direct filtration, membrane, DAF, softening
Turbidity Regulations – Surface Water Treatment Rule

EPA and PSW Turbidity Guidelines

- **EPA MAX**
- **EPA 95th Percentile**
- **PSW 95th Percentile**

NTU

- 0.0
- 0.2
- 0.4
- 0.6
- 0.8
- 1.0
- 1.2
Distribution System Program
Key Monitoring Parameters

- Disinfectant residual
  - Water quality integrity
- Main break frequency
  - Physical integrity
- Pressure management
  - Hydraulic integrity

Identified in WRF 4109 – Criteria for Optimized Distribution Systems
Distribution System
Performance Improvement Variables

- Disinfectant Residual
- Cross-Connection Control
- Customer Complaints
- DBP Control
- Energy Management
- External Corrosion Control
- Flushing
- Hydrant and Valve Maintenance
- Internal Corrosion Control
- Main Breaks

- Nitrification
- Pipe Rehabilitation and Replacement
- Inorganic Accumulation Control
- Pressure Management
- Security and Online Monitoring
- Storage Tank O&M
- Water Age Management
- Water Loss Control
- Water Sampling and Response
Program Phases

• Phase I – Commitment
• Phase II – Baseline data reporting
• Phase III – Self-Assessment completion
• Phase IV – Demonstrated optimization

Subscribers are required to comply with all applicable regulations, regardless of program Phase.
Phase I

• Commitment to participate in the program through Phase III
  – No time limit, self-paced
• Complete subscription form and pay fee
• DO NOT need to meet goals to join
• DO need to be in compliance with regulations
Phase II

• Submission of baseline data
  – Treatment – turbidity
  – Distribution – disinfectant residual/DBP

• Why? Measure improvement over time
Treatment: Turbidity Data Collection

- **Raw Water**
- **Settled or Clarified Water**
- **Filter Effluent Turbidity (CFE & IFE)**
- **Finished Water (optional)**

**Daily maximum reported.**

**Daily maximum OR 4 hour data reported from individual or combined basins. 95th percentile goal of 1.0/2.0 NTU depending on raw water turbidity.**

**4 hour CFE data, 15-minute IFE data (Phase IV), filter profiles. 95th percentile goal of <0.10 NTU.**
# Phase II – Baseline Data (Treatment)

Data from online turbidity meters is entered into PSW software. **More than 2000 data points** create this summary.

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Phase III – Self-Assessment

• Team activity, with objectives to:
  – Identify and prioritize performance limiting factors
  – Develop feasible action plans for improvement
  – Implement plans to realize improvement

*Western Berks Water Authority (PA) – Partnership Team Meeting*
Phase III - Self-Assessment Process

• Self-Assessment of:
  – Performance as a benchmark relative to optimization goals
  – System design
  – System operation
  – Administration

Self assessment guide (SAG) used.

Guidance documentation steps utilities through the Self-Assessment process
## Filtration Self-Assessment Questions

<table>
<thead>
<tr>
<th>Self-Assessment Category</th>
<th>Questions for Gauging Optimization Status</th>
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<tbody>
<tr>
<td>Filtration</td>
<td>Are the air scour and/or surface wash and backwash facilities adequate to maintain a clean filter bed?</td>
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<tr>
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<td>Have the underdrains or support media been damaged or disturbed to the extent that filter performance is impacted or compromised?</td>
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<td>Are the filter rate control valves functioning properly to ensure uniform filtration rates and to provide adequate flow split between filters?</td>
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<tr>
<td></td>
<td>Are filter headloss gauges and flow meters functioning properly?</td>
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<td>Are any other key pieces of equipment out of service that impacts the performance of the filtration process? What are the root causes of this situation?</td>
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<td><strong>Has a formalized filter surveillance program been implemented?</strong></td>
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</table>
Phase III - Action Plan Development

- Action plans developed for high priority areas that are not optimized/partially optimized
- Utilities act in short term and long term!

<table>
<thead>
<tr>
<th>Self-Assessment Category</th>
<th>Issue</th>
<th>Short Term Solution</th>
<th>Person(s) Responsible</th>
<th>Target Date</th>
<th>Long Term Solution</th>
<th>Person(s) Responsible</th>
<th>Target Date</th>
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<tbody>
<tr>
<td>On-line Chlorine Monitor and SCADA Display</td>
<td>Additional online chlorine residual analyzers would provide valuable data</td>
<td>Finalize identification of key areas of distribution system for analyzer placement</td>
<td>Full Team, Consensus Decision Needed</td>
<td>Apr 2013</td>
<td>Install analyzers and connect with SCADA</td>
<td>Dist System Maintenance Supervisor</td>
<td>April 2014</td>
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<td>Budget for and purchase 3 analyzers</td>
<td>Distribution System Ops. Super-Intendent</td>
<td>Jan 2014</td>
<td>Review analyzer data trends for optimization opportunities</td>
<td>Treatment Plant and Distribution System Lead Operators</td>
<td>Ongoing, incorp. Into SOPs</td>
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Phase III - Directors Award

Annual Data Submission: Maintain Directors Award status, receive date tags, and become eligible for 5-, 10-, and 15-Year “longevity” awards.

Tulsa, OK WTP representatives accept the Directors Award at ACE13.
Phase IV - Optimization

• Phase IV awards recognize utilities for demonstrated optimization.
• You are never too small to improve and optimize!

Aurora Water (CO) staff accepting the Excellence in Water Treatment Award
Distribution System Program Impacts

• 11 utilities have completed distribution system self-assessments
  – Serving a population of more than 20 million
• Represents a total distribution system length of 20,000 miles

That’s ¾ of the distance around the world!
Distribution System Self-Assessment Impacts

• Reports from self-assessment reports:
  – Identification of low residual area.
    • Utility installed chlorine booster to address situation.
  – Identification of low residual area determined to be due to nitrification.
    • Utility worked with treatment plant to adjust Cl₂:N ratio.
  – Utility action identified to increase online chlorine monitoring in distribution system.
    • Installed analyzers at pump station locations to take advantage of power, communications, and drain (and enabling them to have more real-time information)
Plants completing the self-assessment process reduce 95th percentile CFE turbidity by an average of over 60% compared to their baseline year.
Marcellus Water Treatment Plant
Onondaga County Water Authority, New York

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<th>Parameter</th>
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<td>95th Percentile CFE Turbidity (NTU)</td>
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<td>Average CFE Turbidity (NTU)</td>
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<tr>
<td>Maximum CFE Turbidity (NTU)</td>
<td>0.48</td>
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</table>

Contact: Mark Murphy, Water Plant Manager
Partnership Summary

• Self-assessment presents a system-specific learning opportunity that can help improve:
  – Operations
  – Performance
  – Teamwork and communications
  – Public health protection

• Positive recognition can build confidence in utility

• Optimization has no finish line!
Questions & Information

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www.awwa.org/partnership