

A Model for the Future- The Mattabassett District WPCF Upgrade

Presented by:
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WRIGHT-PIERCE 
Engineering a Better Environment

Outline

- **Background**
- **Key Issues facing the District**
- **Major WPCF Improvements**
 - **Nitrogen Removal**
 - **Fluidized Bed Incinerator**
- **Sustainability for the Future**

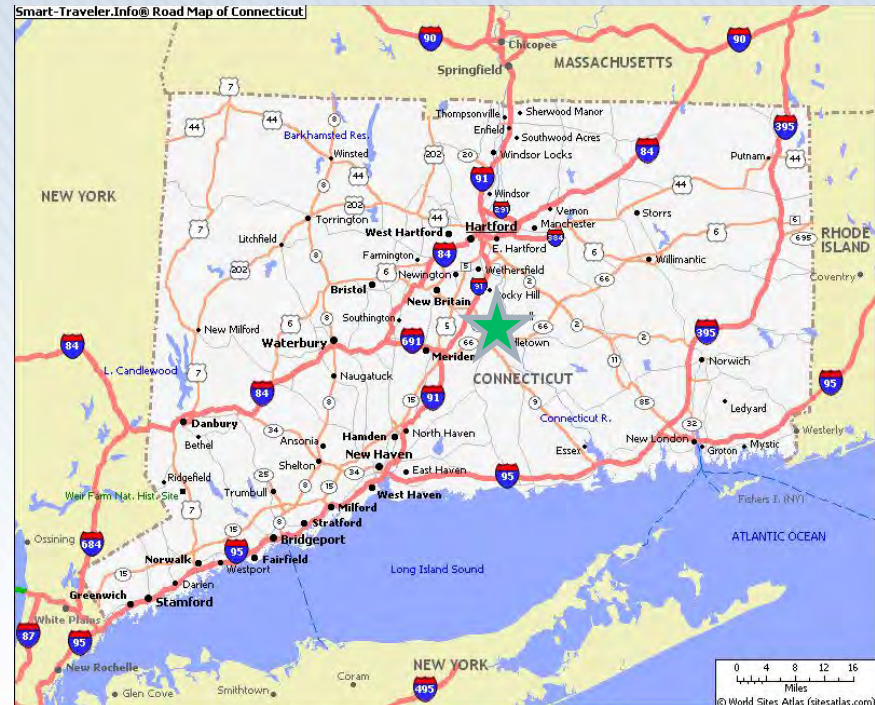
Current Project Status

- Design Services
 - 2007-2011
- Construction
 - \$93M Bid (Dec 2011 – CH Nickerson)
 - Construction started May 2012
 - 97.9% complete by pay req.
 - \$3.9M C.O. (4.38%) – 50% due to added scope items
 - Final completion: July 2015
 - Funded by CT DEEP CWF



The Mattabassett District

- Regional WPCF
 - Serves the member communities of New Britain, Berlin, Middletown and Cromwell and portions of Farmington, Rocky Hill and Newington, CT
- Plant went into operation in 1968
- Upgraded to Secondary Treatment in 1989
- New Outfall in 2007
- Discharges to the Connecticut River



The Mattabassett District

- 2012 Facility - BOD and TSS Removal

- Average Flow \approx 20 mgd
- Peak Influent Flow \approx 80 mgd

- Plant Upgrade – Capacity Expansion

- Average Flow: 35 mgd
- Peak Influent Flow: 110 mgd

- Nitrogen Removal

- Long Island Sound Total Maximum Daily Load (TMDL)
- Will likely have to treat to limit versus purchase credits
- 2014 TN Limit: 834 lbs/day
- TN Limits: 1042 lbs/day @ 35 mgd: 3.57 mg/l (once Middletown connects)



Fluidized Bed Incinerator

- Ex. FBI

- 72,000 lbs/day capacity
 - ◆ 25,000lbs/day (internal)
 - ◆ 35,000 lbs/day± (merchant)
- 25 years old
- Limited remaining life
- District owns Ash Landfill

- Dewatering Filtrate Recycle

- ◆ Ammonia :10-40% of total load
- ◆ BOD: 20% of primary effluent load
- ◆ Significant Soluble BOD
- ◆ Low flow rate \approx 0.5 MGD



- Sewage Sludge Incineration Regulations

- New Emission Requirements
- Host of pollutants including particulates, metals, mercury and dioxins

Constrained Site



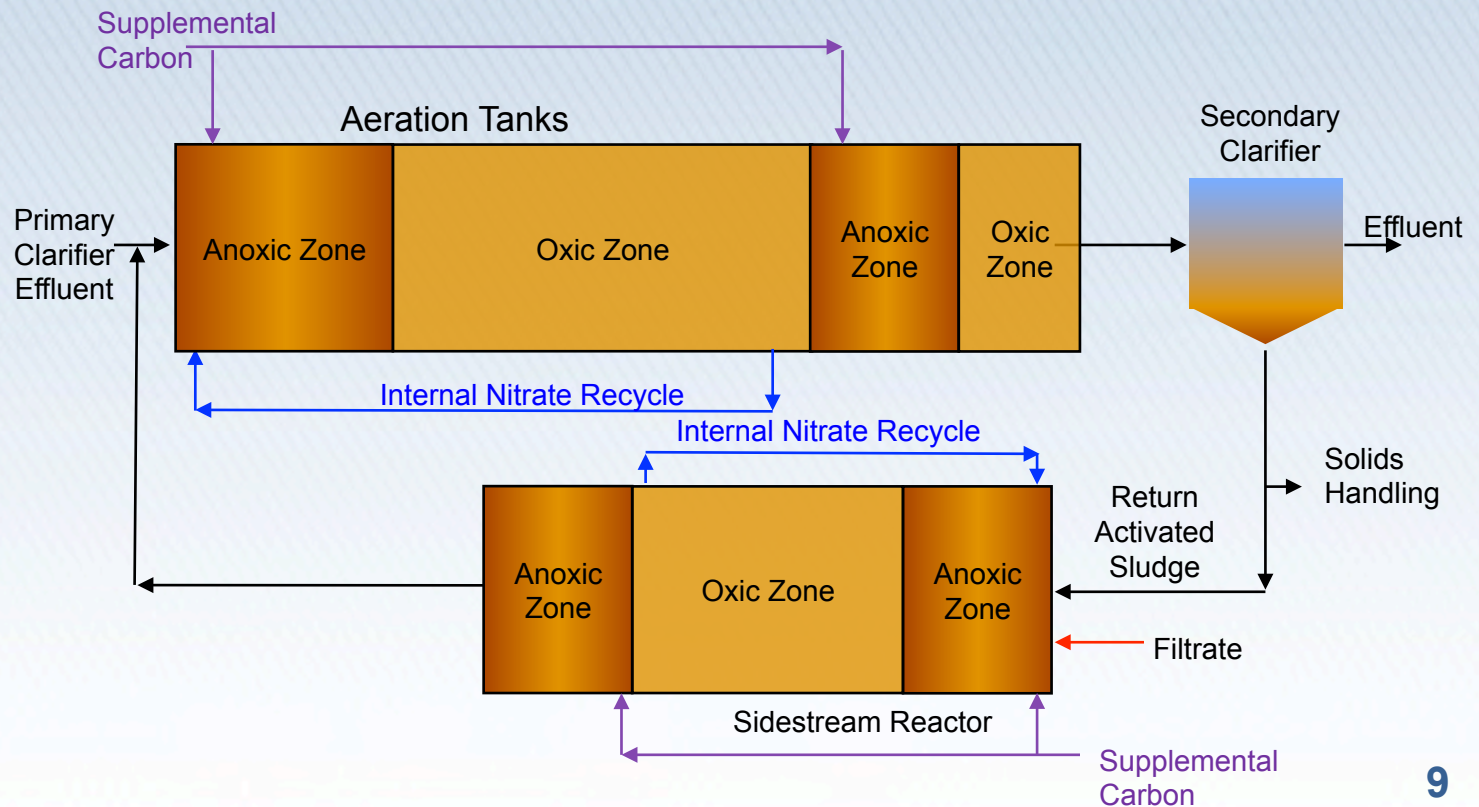
Biological Nutrient Removal

- Modified Ex. Aeration Tanks
- 2 New Aeration Tanks
- 1 New Sidestream Reactor
- 2 new Clarifiers
- Future Conversion to IFAS



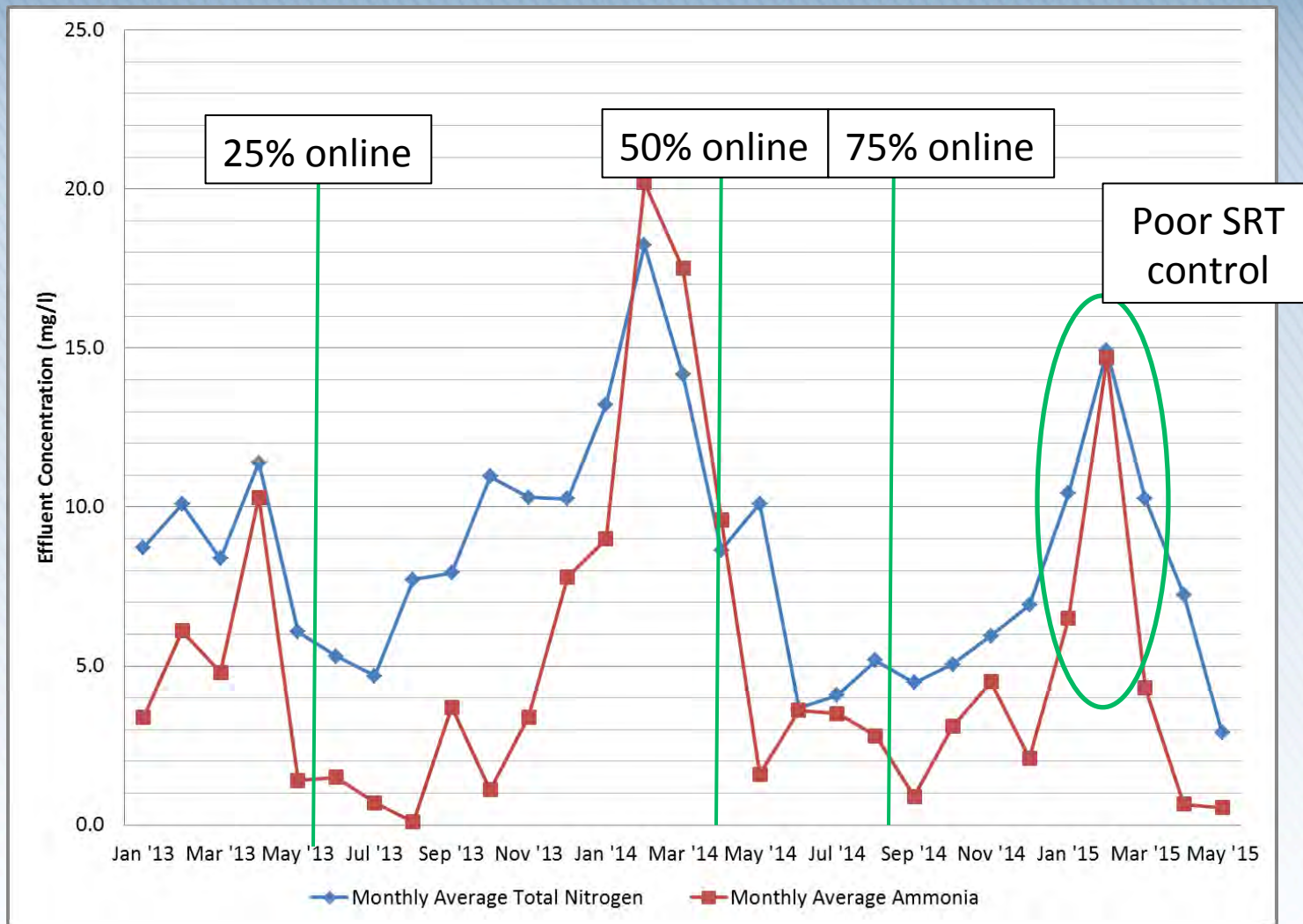
4-Stage Bardenpho with Sidestream Reactor

- Innovative BNR process
 - Take advantage of the high ammonia filtrate
 - High mass located in the SSR
- 6.5 mgal total / 5.5 mgal (forward flow) – 3.5 hrs HRT





Effluent Total Nitrogen



New Fluidized Bed Incinerator

- Sustainable Disposal Option
 - Plenty of capacity in District's landfill
 - Autogenous Burning
 - Merchant sludge not required for self sustainability
 - Excess heat will be used for heating various buildings on-site
- Will meet new SSI rules
 - Wet Electrostatic Precipitator
 - Carbon Adsorption system



FBI under Construction



Sewage Sludge Incineration Regulations

- New Regulation for EPA
 - Language in regulation not representative of current technology performance
 - **“ALL THE TIME”** – what about startup and shut down? Heating and cooling conditions.
 - How to test performance? Continuous? Discrete stack tests?
- Significant discussions between EPA, CTDEEP, Owner, Engineer and Manufacturer on performance testing
- Testing to be completed this month

Criteria Pollutants	BACT	NEW SSI Limits
PM , mg/dSCM	24	9.6
SO _x , ppmvd	26	5.3
NO _x , ppmvd	155	30
CO, ppmvd	100	27
Cd, mg/dSCM	0.106	0.0011
Pb, mg/dSCM	0.46	0.00062
Hg, mg/dSCM	0.142	0.001

All at 7% Oxygen



How Many Cranes/Excavators can you Spot?



Lots of Lifting



Found some Unique Construction Methods



Cold Winter



Electrical Complexities



Sustainable Practices

- Energy Efficiency
 - Siemens Turbocompressor (Turblex) & DO control System
 - (3) 700HP to (3) 400HP
 - CL&P/Eversource Grant
 - ◆ ≈ \$900K
- Odor Control
 - Low H₂S Stream
 - A.T.'s for Treatment



Sustainable Practices

- Solar Panels
- HVAC Heat Recovery
- Incinerator Waste Heat

- CL&P
Incentives:
\$350K



Effluent Pump Station

- Effluent Pumping required at high flows and high river levels
 - 65 MGD Pump Station
 - Climate change impacts (river water level)
 - Flow through design
 - Multi-use facility
- Water Re-use Opportunities
 - Design includes space for re-use pumps
 - Power plant cooling



Summary

- **Comprehensive Upgrade**
 - All equipment/electrical systems updated
- **Nutrient Removal**
 - Meets TMDL goal without purchasing Nitrogen credits
- **Long Term Sludge Disposal Solution**
- **Energy Efficient**
- **Forward Thinking**
 - IFAS, water re-use, climate change, Fluidized Bed Incinerator

FACILITY TOUR & TECHNICAL PRESENTATION

Mattabassett District Water Pollution Control Facility

Wednesday, June 24, 2015 • 8 AM to 2 PM • 245 Main Street, Cromwell, Connecticut



NEWEA's Plant Operations Committee in conjunction with the Connecticut Water Pollution Abatement Association will conduct a facility tour and technical presentation at The Mattabassett District Water Pollution Control Facility.

Technical presentations will highlight the recent upgrade at the Mattabassett Water Pollution Control Facility. This facility is a great example of how communities have dealt with the complex issue of upgrading their wastewater facilities to increase performance and meet tighter regulatory limits which has led to the clean-up of the Connecticut River.

Upgrades to the Mattabassett WPCF which serves seven Central Connecticut communities, 100,000+ residents, include:

- 4-stage Bardenpho nitrogen removal process (2 new & 4 renovated aeration tanks)
- Sidestream reactor for centrate nitrogen removal
- 3 Westfalia centrifuges replacing 3 belt filter presses
- New state-of-the-art 1.5 dt/hr fluidized bed incinerator with state-of-the-art emissions control
- Expansion from 20 mgd to 35 mgd
- 60 mgd effluent pumping station and 6 mgd effluent reuse pumping station
- 7 carbon canister odor control systems
- Updated SCADA & Updated Asset Management System
- Numerous other improvements and upgrades

The registration fee is \$10.00 per person. Space is limited. Register on-line or fill out the form and return to NEWEA.

AGENDA

- 8-9 Registration, Coffee, Pastries
- 9:15 *Upgrade Overview*
Brian Armet, Mattabassett District
- 9:45 *Incinerator Upgrade*
Melissa Hamkins, Wright-Pierce
Ky Dangtran, Infilco Degremont
- 10:15 Break
- 10:45 *Sludge Handling: Centrifuge Selection vs Belt Press vs Rotary Press*
Doug Hankins, Wright-Pierce
- 11:15 *Operators Perspective of Working through the Upgrade*
Mattabassett Operator
- 11:45 Lunch
- 12:45 - 2:00 Facility Tour
- 2:00 Adjourn

Event Sponsors

- Aqua Solutions
- Wright-Pierce

*Sponsorship is available. Call NEWEA.



Connecticut Water Pollution
Abatement Association



Questions

