

TECHNICAL COMMITTEE MEETING
Wednesday, May 7, 2014
2nd Floor Conference Room
Plant Site, 111 Harbor View Avenue, Stamford, CT 06902

5:30 p.m.

Attendees:

Daniel Capano	Chairman, Technical Committee
Daniel Schwartz	Committee Member
Gerald Bosak Jr.	Committee Member
Christina Andreana	Chair, Finance Committee
William Brink	Executive Director, WPCA
Prakash. Chakravarti	Supervising Engineer, WPCA
William Degnan	Plant Supervisor, WPCA

1. Call to Order, Pledge and Roll Call

Chairman D Capano called the meeting to order at 7:15 pm. He added that this was an unscheduled meeting convened to discuss the events of April 30-May 1 2014.

2. Review and approval of March 19, 2014 Technical Committee meeting minutes.

G Bosak made a motion to table the approval of the meeting minutes,; seconded by D Schwartz. The motion was carried 3-0-0.

3. Discharge of partially Treated Sewage on April 30th – May 1st 2014.

W Brink reported to the committee on the extreme wet weather – high flow discharge on the evening of April 30th and early morning of May 1st 2014. He stated that about 25 million gallons was discharged containing suspended solids and fecal coliform that exceeded permit limits. Over four (4) inches of rain were recorded and plant flows increased dramatically that night, with sustained flows above 60 MGD for more than an hour, exceeding the peak design flow of 58 mgd for the plant. The high plant flows are attributed to infiltration and inflow to the sanitary sewers, and likely include discharge from including illegally connected sump pumps. The staff will develop a Request for Qualifications (RFQ) for a comprehensive Infiltration and Inflow (I/I) Study. A draft RFQ will be presented for review at the next Committee meeting on June 4, 2014 The Committee is taking the lead on this and plans to be proactive and expects to retain engineers to perform the study as quickly as possible. D Capano mentioned that there was no plant malfunction or operator error involved in the exceedance..

4. UV System

The SCADA system showed a low UV dose on the evening of May 1st and we reported a permit exceedance the following morning. Investigation of the incident revealed that the night shift operators did not send the email blast

since they observed that the UV lights were indeed on and hence there was no exceedance of the permit limits. W Brink informed the committee that the UV system has been problematic for some time now and he is recommending that a feasibility study be done to identify options for replacing the UV system, including estimating budgetary cost and schedule. He would like to add this task to the scope of work for Hazen & Sawyer who is performing the evaluation of the flow distribution to the final clarifiers, which includes evaluating the hydraulic profile of the secondary process, UV and effluent pumping. Hazen and Sawyer is well qualified to do the feasibility study. (Hazen & Sawyer's memo to W Brink describing their qualifications for this task is included herein)

The committee noted Xylem's performance was not satisfactory and requested a principal to appear before our committee on June 4, 2014

The critical flow level sensors in need of replacement had still not arrived, supposedly being held up in customs. The status of the UV programming that was requested was not available. All the repairs and modifications will be thoroughly tested to ensure the system is operating properly.

5. Odor Control

P Chakravarti mentioned that Wright-Pierce will be submitting their preliminary design review plans next week. The rubber mats have been installed over the filtrate well. W Brink stated that all the scrubbers are running with chemicals

6. Old Business

7. New Business

W Degnan presented the notice from CT DEEP that we will receive \$1,038,159 for sale of Nitrogen credits for calendar year 2013. D Capano commented that this is a testimony to how well the plant is operating.

G Bosak asked about the assertions in George Stadel's letter regarding Synagro. W. Brink said that a response would be discussed at the next Board meeting.

W Brink presented a letter addressed To Michael Handler, Chaiman, WPCA from Mr. Richard L. Redness, Chairman, Harbor Management Commission suggesting several ways to mitigate high flows but not limited to performing an I & I study. (Letter is included herein)

There being no new business to discuss G Bosak made a motion to adjourn the meeting, seconded by D Schwartz, motion carried 3-0-0

The meeting was adjourned at 7:15 pm

May 7, 2014

Mr. William Brink
Executive Director
Stamford WPCA
11 Harbor View Ave
Stamford, CT 06901

**RE: Hazen and Sawyer
Ultraviolet Disinfection Qualifications**

Dear Mr. Brink:

In accordance with our discussion today, Hazen and Sawyer is pleased to provide a summary of our experience with Ultraviolet (UV) Disinfection for municipal wastewater facilities. We have included the following for your review:

Summary Table of UV Disinfection Experience

Hazen and Sawyer has designed over 30 UV disinfection systems for municipal wastewater facilities along the East Coast. We have experience with a variety of manufacturers and configurations, which has given us a strong understanding of the UV technology and a broad variety of successful installations.

Resume of our Corporate Lead for Ultraviolet Disinfection

We present herein the resume of our Corporate UV Disinfection Practice Leader, Ms. Melanie Mann. Ms. Mann has served as the lead for many of the projects indicated in our Summary Table of Experience. Her experience includes all major UV technologies used for municipal wastewater treatment, and she has co-authored and presented numerous technical papers on the technology. As our UV Practice Leader, Ms. Mann gets involved with every UV disinfection design that our Company produces.

Representative Project Descriptions

We have selected three representative projects to showcase our UV disinfection design abilities. We have provided a description for a Trojan UV system which we designed for Peppers Ferry (VA) WWTP in 2012, and is currently in successful operation. Also provided

is a description of a Wedeco UV system that we designed for the 60 mgd Neuse River (Raleigh, NC) WWTP in 2007. We are currently designing an expansion of that same system to accommodate 75 mgd average flow. Our third example project is for the North Durham, NC Water Reclamation Facility, a client for whom we designed their original Trojan UV system in 1993, and they were satisfied enough with the installation to ask us to design a replacement system in 2009, over 15 years later. We have provided client references for each of these three facilities, and encourage you to contact them and inquire about their experience with Hazen and Sawyer.

We hope that this information provides you with a summary understanding of our firm's experience and capabilities related to UV disinfection. Please call me at 860-257-1067 with any questions. We are available to discuss our qualifications in person, and can provide additional information upon request.

Very truly yours,
HAZEN AND SAWYER, P.C.



Ben Levin, P.E.
Senior Associate

cc: Paul Saurer, H&S

Attachments

Summary Table: Hazen and Sawyer Ultraviolet Experience (1 page)

Resume for Ms. Melanie Mann (4 pages)

Project Descriptions (1 page each):

- Peppers Ferry WWTP
- Neuse River WWTP
- North Durham WRF

Hazen and Sawyer Ultraviolet Disinfection Experience

Project	City/Utility	State	Design or Study	Year	Water/WW/AOP	Average Flow (mgd)	Peak Flow (mgd)	UV Vendor
Neuse River WWTP - UV Expansion	Raleigh	NC	Design	2014	Wastewater	75	225	Wedeco
Neuse River WWTP - UV Replacement	Raleigh	NC	Design	2007	Wastewater	60	180	Wedeco
Neuse River WWTP	Raleigh	NC	Design	1991	Wastewater	60	120	Trojan
AlexRenew WRRF	Alexandria Renewable Enterprises	VA	Design	2014	Wastewater	54	115	Trojan
Village Creek WWTP - UV System Improvements	Jefferson County	AL	Design	2013	Wastewater	30	100	Trojan
Eastside WWTP	High Point	NC	Design	2003	Wastewater	26	78	Trojan
North Durham WRF - UV Replacement	Durham	NC	Design	2011	Wastewater	20	60	Trojan
North Durham WRF	Durham	NC	Design	1993	Wastewater	20	40	Trojan
South Durham WRF	Durham	NC	Design	1994	Wastewater	20	54	Trojan
Moore's Creek WWTP	Rivanna WASA, Charlottesville	VA	Design	2011	Wastewater	15	50	Trojan
Northside WWTP	Wilmington	NC	Design	2008	Wastewater	16	40	Trojan
South Wilmington WWTP	Wilmington	NC	Design	2014	Wastewater	16	40	TBD
Sanford Big Buffalo WWTP	Sanford	NC	Design	2013	Wastewater	12	36	Ozonias
Greenville WWTP - UV Replacement	Greenville	NC	Design	2014	Wastewater	17.5	35	Ozonias
Greenville WWTP - UV Expansion	Greenville	NC	Design	1996	Wastewater	17.5	35	Trojan
Falkenburg AWP	Hillsborough County	FL	Design	2007	Wastewater	16.7	27	Trojan
Westside WWTP	High Point	NC	Design	2010	Wastewater		25	Trojan
Northwest Bergen County UA	Bergen County	NJ	Design	1989	Wastewater	10	25	Trojan
North Cary WRF	Cary	NC	Design	2004	Wastewater	12	24	Trojan
Johnston County WWTP	Johnston County	NC	Design	2004	Wastewater	9.5	23	Trojan
Pepper's Ferry WWTP	Pepper's Ferry	VA	Design	2012	Wastewater	9	18	Trojan
Waynesboro WWTP	Waynesboro	VA	Design	2010	Wastewater	6	18	Trojan
Culpeper WPCP	Culpeper	VA	Design	2009	Wastewater	6	18	Trojan
Middle River WWTP	Augusta County	VA	Design	2001	Wastewater	6	18	Ozonias
Totopotomoy WWTP - UV Expansion	Hanover County	VA	Design	2014	Wastewater	7	17.5	Ozonias
Totopotomoy WWTP	Hanover County	VA	Design	2002	Wastewater	5	12.5	Ozonias
MCAS Cherry Point	Havelock	NC	Design	2002	Wastewater	3.5	10.5	Trojan
Havelock WWTP - UV Expansion	Havelock	NC	Design	2013	Wastewater	2.8	8.4	Ozonias
Stuarts Draft WWTP	Augusta County	NC	Design	2002	Wastewater	2.4	7.2	Wedeco
Celanese WWTP	Allegheny County	MD	Design	2004	Wastewater	2.8	6.6	Wedeco
Fishersville WWTP	Augusta County	VA	Design	2004	Wastewater	2	6	Wedeco
University of Connecticut	Stors	CT	Design	2013	Wastewater	1	1	Trojan
Catskill/Delaware UV Disinfection Facility	New York	NY	Design	2012	Water	1300	2020	Trojan
Croton WTP	New York	NY	Design	2013	Water	290	290	Trojan
New Design Road WTP	Frederick County	MD	Design	2007	Water	25	25	Trojan
UV Disinfection System	Mount Pleasant	NY	Design	2013	Water	10	10	Calgon
LT2 Evaluation - Davie County	Davie County	NC	Study	2012	Water	2.6	3.0	N/A
Wiggins Mill WTP	Wilson	NC	Study	2012	Water	5.1	16	Not selected
Toisnot WTP	Wilson	NC	Study	2012	Water	2.6	10	Not selected
Benton WTP	Raleigh	NC	Study	2013	Water	10	20	Wedeco
UV AOP Pilot - NSF Project	Suffolk County Water Authority	NY	Study	2011	Water/AOP	200 gpm	N/A	Trojan
UV AOP Pilot - NSF Project	Cincinnati	OH	Study	2012	Water/AOP	10-50 gpm	N/A	ETS
UV AOP Feasibility Evaluations	Spottsylvania County	VA	Study	2013	Water/AOP	-	-	N/A
UV AOP Pilot	Hollywood	FL	Pilot	2013	Wastewater/AOP	-	-	Wedeco
UV AOP Pilot	Las Vegas	NV	Study	2009	Water Reuse/AOP	60 gpm	120 gpm	Trojan
Scottsville WWTP	Rivanna WASA, Charlottesville	VA	Design	2012	Wastewater	100 gpm	140 gpm	Trojan



Melanie A. Mann, PE
Senior Associate

Areas of Expertise

- UV disinfection
- Chemical disinfection
- Water Reuse
- Filtration

Professional Record

Ms. Mann is Hazen and Sawyer's Design Leader for UV disinfection of wastewater and reuse. She is an expert in the evaluation, planning, detailed design, and optimization of ultraviolet (UV) disinfection facilities and evaluations of alternate disinfectants. Her UV design experience includes all major UV technologies used for municipal water and wastewater treatment: low-pressure high-output lamps in horizontal and vertical configurations for open channel installation, medium-pressure lamps in open channel systems, and closed-vessel systems for high-level reuse applications.

Ms. Mann specializes in all phases of ultraviolet disinfection projects, from evaluations comparing UV to other disinfection alternatives to pilot testing, final design, and construction administration. Representative projects include:

Summary of UV Projects

Ms. Mann has served as the lead process designer for many UV systems including the following:

- 225-mgd peak UV system expansion for Neuse River WWTP, Raleigh NC (In design in 2014)
- 115-mgd peak UV disinfection system for Alexandria Renew Enterprises, VA (In design in 2014)
- 35-mgd peak UV system for Greenville NC WWTP (In design in 2014)
- 36-mgd peak UV disinfection system for the Big Buffalo Creek WWTP in Sanford NC (Complete 2013)
- 60-mgd peak UV facility for the North Durham WRF in Durham NC, including evaluated bid with life cycle costs, detailed design, factory test, startup assistance (Complete 2011)
- 50-mgd peak UV disinfection facility for the Moores Creek WRF (Charlottesville VA), including evaluated bid with life cycle costs, detailed design, startup assistance (Complete 2011)

Academic Credentials

MCE North Carolina State University, 1996

BSCE North Carolina State University, 1988

PE License: North Carolina, Virginia

Employment Record

1988 - Pres. Hazen and Sawyer, P.C.

Professional Activities

International Ultraviolet Association

Water Environment Federation

WaterReuse Association

American Water Works Association

Publications and Presentations

"Basics of UV Disinfection for Wastewater and Reuse," E. Blatchley III and M. Mann, ASCE Continuing Education Webinar, December 2013.

"UV Disinfection of Drinking Water: What's New?" Scott M. Alpert, Ph.D., PE, and Melanie A. Mann, PE, Kentucky-Tennessee Water Professionals Conference, 2013.

"Alternate Indicator Organisms for Reclaimed Water in North Carolina," Patricia D. Stiegel, PE, Melanie A. Mann, PE and Marla Dalton, proceedings of WEF Disinfection and Public Health 2013.

"Improving UV Disinfection Performance," M. Mann, Fall Conference of Georgia Association of Water Professionals, Dalton, GA, 2012.

"Impact of North Carolina 2U Reclaimed Water Rules on Design of UV Disinfection," Patricia Drummey Stiegel, PE and

- 21-mgd UV-Advanced Oxidation process detailed design, for ground-water recharge at the Miami Dade County FL South District Advanced Water Treatment Facility, including evaluated UV equipment bid (Design 90% complete in 2011)
- 180-mgd peak UV system for Neuse River WWTP, Raleigh NC, in operation since 2007

Wastewater UV Disinfection

- **Greenville WWTP UV Disinfection System Replacement, Greenville, NC:** Ms. Mann is Project Manager for design of the UV disinfection system for this 35-mgd peak flow plant. The new LPHO UV system will greatly reduce power consumption compared to the existing MP UV system. (Design in progress in 2014)
- **Neuse River WWTP 75-mgd Expansion, Raleigh, NC:** Ms. Mann is Process Design Lead for expansion of the existing UV disinfection system from a peak capacity of 180 mgd to 225 mgd. (Design in progress in 2014)
- **Noman Cole PCP Disinfection Facilities Rehabilitation, Fairfax County, VA:** Ms. Mann is Process Design Lead for design of replacement and rehabilitated disinfection facilities for this 67-mgd plant. (PER in progress in 2014)
- **AlexRenew WRRF UV Disinfection Upgrade, Alexandria Renew Enterprises, VA:** Ms. Mann is Project Engineer for replacement of existing 115-mgd peak flow UV system with new 115-mgd peak UV system. (PER in 2013, Design in progress in 2014)
- **Village Creek WWTP UV Disinfection Improvements, Jefferson County, AL:** Ms. Mann served as Lead designer of hydraulic and controls improvements for an existing 150-mgd capacity medium pressure UV system at this 60-mgd plant. (2013)
- **Big Buffalo Creek WWTP Expansion, City of Sanford, NC:** Ms. Mann was Project Manager for design of UV disinfection, denitrification filters, secondary clarifiers and RAS pump station for the 12-mgd expansion. (2013)

Melanie Mann, PE, proceedings of 2012 NC AWWA/WEA Conference.

"Establishing the Process Performance Criteria for an Ultraviolet Advanced Oxidation Process – Challenges from Florida's First Large Scale Ground Water Recharge Facility Design," by E. Tilen, B. Eleazer and Melanie Mann, proceedings of WEFTEC 2011.

"Bidding, Testing, and Start-up of a Reuse Disinfection System in Florida" by Josefin Edeback-Hirst, PE and Melanie Mann, PE. Published in the IUVA News, Issue #4, 2010.

"Optimizing UV Disinfection for Wastewater," by Patricia Drummey and Melanie Mann, 2010 South Carolina Environmental Conference.

"Application of Computational Fluid Dynamics to Support Designs of Full-Scale Wastewater UV Disinfection Channels," by Shanshan Jin and Melanie Mann, proceedings of 2009 IOA/IUVA Joint Conferences, Cambridge, Mass.

"Pre-Selection of UV Equipment for North Durham WRF," by Patricia Drummey and Melanie Mann, NC AWWA-WEA Annual Conference, 2009.

"Case Study of a Florida Reuse UV Disinfection System," by Josefin Edeback-Hirst and Melanie Mann, proceedings of WEFTEC 2009.

"Process Water Recycle Study at OWASA's Jones Ferry Road Water Plant," Davis, P. and Mann, M. proceedings of NC AWWA/WEA Annual Conference, Nov. 2004.

"Considerations for Design and Operation of Sodium Hypochlorite Disinfection Systems," Wang, Z.M., Bishop, M.M. and Mann, M.A. Journal NC AWWA/WEA Conference, Research Triangle Park, North Carolina. 1998.

- **Pepper's Ferry WWTP UV Disinfection Facility, VA:** Ms. Mann was Technical Reviewer for design of 18-mgd peak capacity UV disinfection process, replacing chlorine disinfection. UV equipment was selected with a competitive life cycle cost bid prior to final design. (2012)
- **Moore's Creek WRF UV Disinfection Improvements, Rivanna Water and Sewer Authority, VA:** Ms. Mann was Technical Reviewer for design of 50-mgd peak capacity UV disinfection process for this 12-mgd plant. UV equipment was selected with a competitive life cycle cost bid prior to final design. (Construction complete in 2011)
- **South District Advanced Water Treatment Facility, Miami Dade County:** Ms. Mann was Lead Designer for Hazen and Sawyer's portion of the UV-H₂O₂ Advanced Oxidation process for this 21-mgd plant, treating tertiary wastewater plant effluent to exceed primary drinking water standards for recharge of a drinking water aquifer. UV-AO equipment was selected with a competitive life-cycle cost based equipment bid. (2011)
- **North Durham WRF Disinfection Improvements, City of Durham, NC:** Ms. Mann was Technical Reviewer for design of a 60-mgd peak capacity UV disinfection system at this BNR plant. UV equipment was selected based on a competitive equipment bidding process and life cycle cost analysis prior to final design. (2011)
- **Falkenburg AWP Expansion, Hillsborough County FL:** Ms. Mann was Technical Reviewer for design of 27-mgd peak capacity UV disinfection facility, replacing chlorine. UV system meets Florida's high level disinfection standards for public access reuse. (2009)
- **South Durham WRF Expansion, City of Durham, NC:** Ms. Mann was Project Engineer for design of 40-mgd peak capacity UV disinfection system for this BNR plant. UV system was installed in existing chlorine contact tanks. (1994)
- **North Durham WRF Expansion, City of Durham, NC:** Ms. Mann was Project Engineer for design of new dual-media gravity filters and 54-mgd peak capacity UV disinfection system for this BNR treatment facility. (1993)
- **Neuse River WWTP Expansion, City of Raleigh NC:** Ms. Mann was Project Engineer for design of 120-mgd peak capacity UV disinfection system installed in existing chlorine contact tanks. When started up, this was the largest UV disinfection system in the US. She also served as project engineer for design of six new dual-media gravity filters, doubling the filtration capacity at this plant. (1991)

Water Treatment UV Disinfection

- **Croton Water Filtration Plant Process Management Plan, New York City DEP, New York, NY:** Ms. Mann was Technical Reviewer for the UV disinfection Process Management Plan for this 290-mgd water treatment plant. (2012)
- **Catskill/Delaware UV Disinfection Facility, New York City DEP, Westchester County, NY:** Ms. Mann provided startup training to plant operation and maintenance staff at this 2020-mgd UV disinfection facility treating drinking water for New York City from the Catskill and Delaware Reservoir System. (2011-2012)
- **New Design Road WTP Expansion, Frederick County, MD:** Ms. Mann was Technical Reviewer for the 25-mgd plant expansion including UV disinfection, gravity thickener, belt filter presses, backwash equalization, pump stations, and chemical systems. (2007)

UV Process Evaluations

- **Noman M. Cole, Jr. PCP Disinfection Evaluation, Fairfax County VA:** Ms. Mann conducted an evaluation of alternative disinfectants, including UV, ozone, bulk hypochlorite, and on-site generation of hypochlorite for this 120-mgd peak flow advanced wastewater plant. (Study 2014)
- **Village Creek WWTP Plant Optimization Study, Jefferson County (Birmingham), AL:** Ms. Mann completed an evaluation of alternate disinfectants as part of the study for the 60-mgd WWTP. The facility includes one of the world's largest medium pressure UV disinfection systems, which was originally designed to disinfect a wet weather peak flow of 360 mgd. The alternatives evaluated in the study included bulk delivery of sodium hypochlorite and sodium bisulfite, use of chlorine gas and sulfur dioxide gas, and replacing the existing medium pressure UV system with a new low pressure UV system. The result was a recommendation to improve the hydraulic design and optimize the existing medium pressure UV system. (Study: 2011, Construction: 2013-2014)
- **Valley Creek WWTP Process Evaluation, Jefferson County, Birmingham, AL:** Ms. Mann conducted a process evaluation of this 600-mgd medium pressure UV facility and provided recommendations to improve performance and reliability and reduce power consumption. (Complete in 2012)
- **Ultraviolet Process Evaluation, City of Spartanburg, SC:** Ms. Mann conducted a process evaluation of three UV disinfection systems for three wastewater treatment plants and provided recommendations to improve performance and reduce power consumption. (Complete 2013)
- **Mauldin Road WWTP UV Design Review, Renewable Water Resources, Greenville, SC:** Ms. Mann conducted a design review of this 75-mgd peak flow UV system, designed by others, to identify factors contributing to heat-related failure of cables supplying power to the UV lamps. (Complete in 2012)

Peppers Ferry Regional Wastewater Treatment Plant UV Disinfection Facilities

RADFORD, VIRGINIA

The Peppers Ferry Regional Wastewater Treatment Plant (PFRWTP) sought to convert from disinfection with chlorine gas and dechlorination with sodium bisulfite to ultraviolet disinfection. Hazen and Sawyer was retained to prepare a preliminary engineering report and to complete final design of new UV facilities. As part of the preliminary engineering phase of the project, Hazen and Sawyer completed the following:

- Multi-seasonal confirmation of ultraviolet transmittance (UVT) - For a two month period, in both the summer and winter, secondary effluent was monitored to measure UVT.
- Preliminary design based on both horizontal and vertical system configurations – Hazen and Sawyer determined proper system sizing and configuration to meet Virginia Sewage Collection and Treatment (SCAT) Regulations and to provide redundancy for both horizontal and vertical low pressure, high output (LPHO) system configurations.
- Paper study of lamp fouling potential based on industrial flow contributions and the potential for high influent sulfate concentrations.
- An evaluation, including cost estimates, for both a new UV facility and retrofitting of an existing chlorine contact basin with UV.
- The UV facility was designed to allow PFRWTP to add filtration between UV and the secondary clarifiers in the future.
- The final design includes a new facility, fixed effluent weirs for maximum hydraulic control with minimal operator effort, and integral non-potable water (NPW)

Reference

Mr. R. Clarke Wallcraft
Executive Director
Peppers Ferry Regional Wastewater
Treatment Authority
Post Office Box 2950
Radford, VA 24141
(540) 639-3947
cwallcraft@jetbroadband.com

pumping station and new effluent flow metering and sampling.

- Competitive prices for replacement lamps and ballasts were secured, guaranteed for 20 years and tied to a price index.
- During Final Design, Hazen and Sawyer conducted an evaluated bid process for competitive selection of UV equipment and prepared final design documents.



UV

Neuse River Wastewater Treatment Plant Upgrades and Expansions - UV Disinfection Facilities

RALEIGH, NORTH CAROLINA

The Hazen and Sawyer provided preliminary engineering, design, construction, inspection O&M manuals and startup services for the Neuse River WWTP Improvements project. The work included an upgrade and expansion of the plant's UV disinfection system from 120 mgd to 180 mgd peak capacity, in

system, installed in 1991 in existing chlorine contact tanks as part of the plant's 60-mgd expansion. When it was installed, this 120-mgd UV system was the largest wastewater UV facility in the US.

The original UV system included 4608 lamps and a peak power demand of 300

kW. The new UV system installed in 2007 has a disinfection peak flow capacity of 180 mgd, a 50% increase over the original capacity, installed in the same number of channels. The new system is based on amalgam-lamp UV technology with variable power

Reference

Mr. T. J. Lynch
Assistant Public Utilities Director
City of Raleigh
Public Utilities Department
Post Office Box 590
Raleigh, NC 27602-0590
(919) 662-5700
TJ.Lynch@raleighnc.gov

Neuse River WWTP Improvements (Including UV Expansion)		
Task	Scheduled	Actual
Bid Date	July 2004	September 2004
Notice to Proceed	September 2004	January 2005
Substantial Completion	March 2007	June 2007

Figure 1.1

Neuse River WWTP 60 mgd Improvements (Including UV Expansion)	
Bid Price	\$15,325,000
Actual	\$15,722,000

Figure 1.2

addition to improvements to aeration basins, primary settling tanks, sludge storage tanks, and integration of all new facilities into the plant SCADA system.

Hazen and Sawyer also designed the plant's original UV disinfection

ballasts for better energy efficiency, and also has automated lamp wipers for in-channel cleaning. The new system was installed while keeping the existing UV system operational and included construction of channels that can accept additional banks for future expansion. The new system uses motorized weir gates for level control, which replaced the counterweighted level control gates in the

original system. The UV facility includes a full function SCADA workstation as the UV system local control interface, and the UV controls can be accessed from any SCADA workstation on site. Hazen and Sawyer's construction documents for the Neuse River UV project included a Base Bid (Trojan) and an Alternate Bid (Wedeco), so that the owner could choose the system they wanted based on competitive pricing for both systems.

The construction plans included separate structural, mechanical, and electrical drawings for each of the UV manufacturers, since each had unique requirements. Although the Wedeco system was somewhat more expensive, the City chose Wedeco because of the ease of access to ballasts located in cabinets. Hazen and Sawyer designed an elevated slab and air conditioned room above the existing UV channels to support and cool the ballast cabinets required for the Wedeco system. Hazen and Sawyer is currently in the process of designing the expansion of the plant system to 225 mgd peak flow. Schedule and cost information for the Neuse River WWTP Improvements (Including UV Expansion) can be found in Figure 1.1 and Figure 1.2.



North Durham Water Reclamation Facility 2009 Improvements UV Disinfection Facilities

DURHAM, NORTH CAROLINA

The 2009 Improvements project included a new 60-mgd peak capacity UV disinfection system. The project also included adding a sixth biological nutrient removal (BNR) tank to the existing BNR process, improvements to flow distribution to the BNR tanks, and structural repairs to primary clarifiers at the North Durham Water Reclamation Facility.

The new UV system replaced an existing UV disinfection system, originally installed in 1993 and also designed by Hazen and Sawyer. Hazen and Sawyer prepared a Preliminary Engineering Report for the UV facility design, including the following efforts:

- Tested filter effluent for UV transmittance.

- Conducted collimated beam study to confirm design UV dose.
- Evaluated costs of constructing a new UV facility and retrofitting the new UV system into the existing UV tanks.
- Preliminary design of horizontal and vertical UV lamp configurations.
- Evaluated impact on UV system hydraulic profile of recently re-issued FEMA flood maps, which raised the design flood elevation at the plant outfall by five feet.

During final design, Hazen and Sawyer assisted the City in conducting an evaluated bid process for competitive selection of the new low pressure, high output UV

Reference

Mr. Robert Dodson
Wastewater Superintendent
Department of Water Management
City of Durham
Post Office Box 2251
Durham, NC 27702
(919) 560-4336
robert.dodson@durhamnc.gov

system. The equipment bid allowed the City to consider life cycle costs for power and UV lamps and provided the City with competitive costs for replacement UV lamps. Final design of the UV facility included a new UV structure, fixed effluent weirs for reliable level control and to minimize head losses, and new effluent flow metering and sampling.



UV

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CITY OF STAMFORD, CONNECTICUT
HARBOR MANAGEMENT COMMISSION

May 7, 2014

Mr. Michael Handler
WPCA Chairman
Stamford Government Center
888 Washington Boulevard
Stamford, Connecticut 06904-2152

Subject: Spill prevention-Sewage Treatment Plant

Dear Mr. Handler:

Thank you for keeping me up-to-date with respect to the recent untreated discharge into Stamford Harbor. As mentioned in our conversation yesterday, the Harbor Management Commission (HMC) is concerned that while efforts have been made to determine the reason for several recent notifications of Permit limit Exceedance spills, there doesn't seem to be a focus on reducing the sources causing periodic overloading leading to catastrophic situations.

It is a basic goal of the Stamford Harbor Management Plan to protect and enhance environmental quality, including water quality, in Stamford Harbor. The plan encourages best management practices to reduce pollutant discharges into the harbor, including those from the sewage treatment plant. It is apparent that significant amounts of stormwater runoff are infiltrating the City's sanitary sewer system. Reduction of infiltration, with the aim of minimizing its impact, needs to be a high priority of the WPCA and the City as a whole. The HMC is aware that there are a number of points within the sewered areas in which flow meters have been installed, that there have been areas wherein old sewer lines have collapsed and have been the subject of emergency repairs, and that a few areas are being video inspected. What the HMC does not see is a comprehensive plan for systematically investigating, compiling data, and the preparing an action plan.

Leaving the adequacy and condition of the plant aside for the moment, there appear to be at least two main sources of infiltration which can, and must, be addressed: 1- damaged and/or deteriorating sewer lines; and 2- illegal discharge of sump pumps; each of which significantly contribute to inappropriate loading on the treatment plant. The HMC recommends that a program be instituted to analyze the flow data from the existing meters, video ALL of the lines to determine specific condition, and conduct inspections of all buildings within the sewered areas to determine the extent of illegal connections. The data can then be compiled and a comprehensive action plan developed the purpose of which would be to program the elimination of sources of infiltration. Obviously, this will need to be a long term, on-going plan requiring budgeting, and will likely need to be out-sourced. But it is long overdue.

The HMC will be discussing this matter during our May 20, 2014 meeting. If you feel there is additional information which can be conveyed, or you would like to attend, please do not hesitate to contact me at ray.redniss@rednissmead.com or (203) 327-0500. Meanwhile, we look forward to working cooperatively with the City, state and federal agencies in conducting a full assessment of the problems and identifying workable solutions.

Respectfully submitted,

A handwritten signature in cursive script that reads "Raymond L. Redniss".

Raymond L. Redniss, Chairman

cc:

Mayor David Martin; Mr. Lou Casolo, City Engineer; Mr. Ernie Orgera, Director of Operations; Mr. Frank Fedeli, Stamford Office of Operations;