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FEB 24 2009

PUBLIC SERVICE
COMMISSION

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF NORTHERN KENTUCKY)
WATER DISTRICT FOR ACCREDITATION)
AND APPROVAL OF WATER COMMISSIONER) CASE NO. 2009-00084
TRAINING)

APPLICATION FOR APPROVAL AND ACCREDITATION
OF WATER COMMISSIONER TRAINING

Northern Kentucky Water District (NKWD), by counsel, petitions the Commission for an order approving and accrediting training for its water commissioners as provided by KRS 74.020(6) and (7). The following information is filed in accordance with the Commission's regulations:

1. NKWD'S office address is 2835 Crescent Spring Rd., Erlanger, KY 41018-0640. Its principal officers are listed in its current Annual Report on page 6, which is filed with the Commission as are its prior years Reports;
2. NKWD is a non-profit water district organized under Chapter 74 and has no separate articles of incorporation.
3. NKWD serves retail customers in Kenton and Campbell Counties and sells water at wholesale to non-affiliated water distribution systems in Pendleton County.
4. NKWD has six commissioners, who have over the course of this calendar year participated in a number of training sessions which NKWD believes conform to the requirements of 807 KAR 5:070.

5. In order for the commissioners to receive credit for this training, it is necessary to obtain approval from the Commission for the training sessions.

6. In conformity to 807 KAR 5:070 (1) and (2), five copies of the training manuals are being submitted for review, which contain the following information:

1. The name and address of the applicant
2. The name and sponsor of the program and the subject of the program
3. A summary of the content of the program
4. The number of credit hours requested for each program
5. The name and qualifications of each instructor
6. A copy of the written materials provided
7. The names of any certifying organizations

7. Minutes of the meetings of the training sessions will be available after the date for each training session.

8. Copies of board meeting minutes for 2009, which indicate the time and date of the meetings, as well as a roster of those attending will be available after the date of each training session.

9. All board meetings are advertised to the public and open to the public, but the specific agenda or training programs are not listed in the notice.

10. No fees are assessed for attending a board meeting or in participating in the training session.

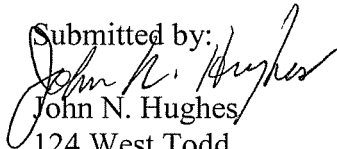
11. The instructors' relationship with Northern or their employment is explained in item 5 of each program description.

12. NKWD asserts that the programs all relate to the areas of instruction for which approval shall be granted as set forth in 807 KAR 5.070(2). These programs are in addition to the routine status reports, project briefings and informational presentations that the Northern staff provides to the Board members as part of their oversight of the District's operations, which occur on a regular basis.

13. In its order in Case No. 2007-00387, the Commission stated that Northern should submit its request for approval of commissioner training 30 days prior to the scheduled sessions. The first training session is scheduled for March 30, 2009.

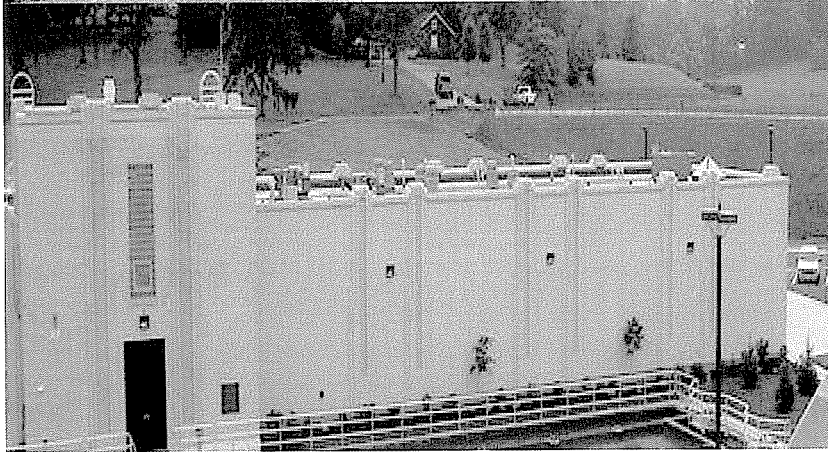
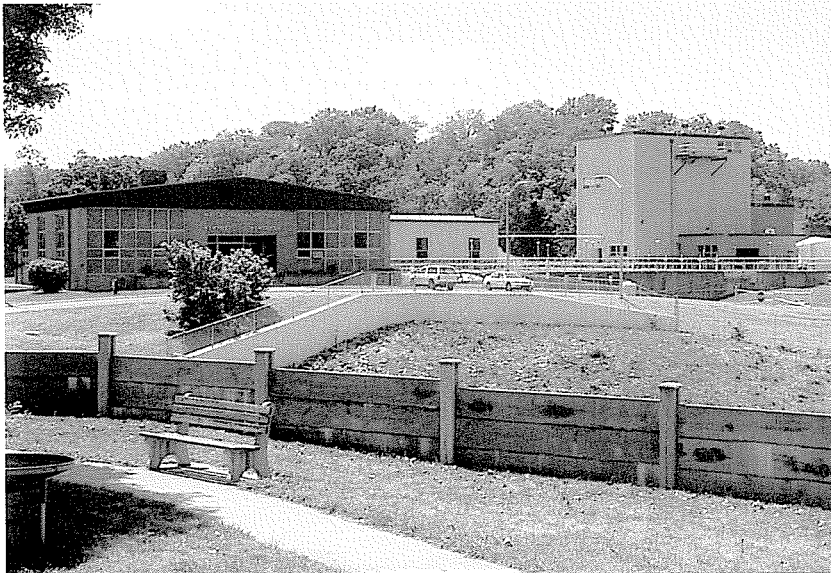
14. NKWD seeks approval of these credit hours as soon as possible so that if the training hours are not approved, the district's commissioners can attend other approved training sessions.


For these reasons, NKWD requests an order approving the credit hours of training for each of the programs offered to its water commissioners.

Submitted by:

John N. Hughes
124 West Todd
Frankfort, KY 40601
Attorney for Northern Kentucky
Water District

ORIGINAL

Commissioner Training 2009



Northern  Kentucky
Water District



Commissioner Training — 2009

Tab	Topic
A	Drinking Water Update
B	Construction Contract Administration
C	Worker's Compensation Overview
D	Radio Frequency Meter Reading – “Now and Future”
E	The Bond Rating Process
F	Benchmarking Update
G	UV Advanced Oxidation
H	Proposed Budget – 2010
I	AquaVenture 2009

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**PUBLIC SERVICE
COMMISSION**



Commissioner Training — 2009

1 – Item One Northern Kentucky Water District
2835 Crescent Springs Road
P.O. Box 18640
Erlanger, KY 41018



Commissioner Training — 2009

2 – Item Two Name: Drinking Water Update
Sponsor: Department for Environmental Protection
Environmental & Public Protection Cabinet
Subject Matter: Overview of recent regulatory changes and updates.



Commissioner Training — 2009

- 3 – Item Three The purpose of this training session is to update the Board of Commissioners on recent changes involving regulatory agencies and drinking water compliance.



Commissioner Training — 2009

- 4 – Item Four One Credit Hour – Copy of Board Minutes showing Commissioners attendance will be attached after March 30, 2009 meeting.



Commissioner Training — 2009

5 – Item Five Ms. Julie Roney, Environmental Scientist,
 Department for Environmental Protection
 Environmental & Public Protection Cabinet

Bio of the presenter is attached.

JULIE W. RONEY

100 Plantation Drive
Lawrenceburg, KY 40342
Phone: 859/321-7562

SUMMARY OF EXPERIENCE:

During the past 28 years I have acquired considerable experience in the environmental field, with emphasis on drinking water. This includes technical, regulatory, managerial and financial areas.

PROFESSIONAL EXPERIENCE:

June 16, 2008 to Present

Environmental Scientist II

Transferred and reclassified due to Division of Water reorganization; duties will include functioning as the KY drinking water point of contact for compliance with the Safe Drinking Water Act and EPA primacy
Coordinates drinking water-related activities in the Division (engineering, capacity development, compliance, water withdrawal, etc)
Provides advice and training to internal DOW staff and regulated entities and organizations

June 1, 2003 to June 16, 1008

Environmental Control Supervisor

Supervisor of the Drinking Water Branch's Technical Assistance and Outreach section, overseeing 6 positions (include Web development)
Additional responsibilities in personnel and administrative areas, including budget
Coordinate drinking water technical assistance activities, including Area-Wide Optimization Program
Sanitary survey development and documentation
Drinking water security issues and EPA Counter-terrorism Grant
Disinfection By-Product, Surface Water Treatment and Groundwater Rules "manager"
Plan and conduct training and workshops (both state staff and water systems)
Technical advisor on drinking water regulatory and scientific issues
Acting Branch Manager when Branch Manager is absent

January 15, 2002 to May 31, 2003

Environmental Scientist II

Same as Environmental Technologist III

Expanded duties of Environmental Technologist III include advisor to Drinking Water Branch on regulatory and scientific issues
Continue coordination of CTAP and AWOP
Coordinate Division of Water drinking water security issues

February 1, 1999 to January 15, 2002:

Environmental Technologist III

Commonwealth of Kentucky
Department for Environmental Protection
Division of Water/Drinking Water Branch
14 Reilly Road
Frankfort, KY 40601

Responsible for coordinating the water treatment Comprehensive Technical Assistance Program (CTAP) and the Area-wide Optimization Program (AWOP) for the Drinking Water Branch;

Program Manager for new drinking water regulations related to specific contaminants

January 1, 1998 to January 31, 1999: Director of Water Quality
Kentucky-American Water Company
2300 Richmond Road
Lexington, KY 40502

Position of Water Quality Superintendent upgraded to Director
Expanded areas include involvement in company budgetary issues and projects, public relations and company acquisitions as well as indirect involvement in the supervision of 3 additional departments and oversight of a package wastewater plant

July 1, 1992 to December 31, 1997: Water Quality Superintendent
Kentucky-American Water Company

Position of Assistant Production Superintendent/Water Quality upgraded to Water Quality Superintendent
Additional responsibilities included: chairman of the Environmental Management Committee, KAWC representative to corporate Water Quality and KAWC liaison with the Kentucky Natural Resources and Environmental Protection Cabinet
Primary areas of additional responsibilities were compliance with all environmental regulations (air, wastewater, solid and hazardous wastes as well as water), permit processing, and formulation of company environmental policy

April 1, 1991 to June 30, 1992: Assistant Production Superintendent/Water Quality
Kentucky-American Water Company

Responsible for all aspects of water quality as produced by 2 water plants;
Duties included the direct supervision of 4 employees and indirect supervision of 18, assessment of treatment processes, coordination of projects involving water quality/treatment, review/implementation of Federal and State regulations, filing of compliance reports and interaction with appropriate State and company officials
Also responsible for the management of a departmental budget of \$400,000 and a treatment chemical budget of up to \$1 million, preparation of Request for Proposals and Budget Project Memorandums
Involved in employee relations: hiring of personnel, organization of departmental responsibilities and training

August 1, 1988 to March 31, 1991: Water Quality Supervisor
Kentucky-American Water Company

Responsible for the chemical/physical/microbiological quality of the water produced at large water treatment plant. Duties included overseeing the certified plant laboratories, assessing and optimizing treatment, ordering chemicals, collecting and analyzing samples,
Involved in special projects, budget preparation

September 24, 1987 to July 31, 1988: Chemist
Kentucky-American Water Company

Responsible for the atomic absorption spectroscopy lab and the drinking water certification program associated with the instrument. Also coordinated the certified bacteriological program in conjunction with the Water Quality Supervisor and co-supervised the plant chemical/physical laboratory

March 10, 1980 to September 23, 1987:

Lab Technician/Water-Microbiology Lab Supervisor
Commonwealth Technology Incorporated
2520 Regency Road, Suite 104
Lexington, KY 40503

Initial responsibilities included the chemical/physical/microbiological analysis of water, wastewater, industrial waters, mine drainage and soils.

Set up the microbiology laboratory and obtained State certification for drinking water

Promoted to Water-Microbiology Supervisor with added responsibilities of overseeing all testing performed in the water and microbiology labs. Also coordinated sample collection and log-in, reviewed work performed by laboratory personnel, prepared all laboratory reports and summaries, trained new personnel

Acted as laboratory consultant to both water and wastewater laboratories

EDUCATIONAL BACKGROUND:

University of Kentucky, Lexington, KY

Obtained a Bachelor of General Studies in which I developed my own undergraduate program of study (concentrating in Environmental Sciences)
Graduated December 1979 with "High Distinction"

University of Kentucky, Lexington, KY

Post-graduate studies in Microbiology
1981-1982

University of Kentucky, Lexington, KY

Obtained Bachelor of Science in Biology (completed degree requirements from 1979)
Graduated December, 1990 with "High Distinction" and Departmental Honors

Eastern Kentucky University, Richmond, KY

Post-graduate work in Biology
1992-1994

PROFESSIONAL AFFILIATIONS/CERTIFICATIONS:

American Water Works Association –Kentucky-Tennessee Section
(Board Chair July 2005-July 2006)

Kentucky Water and Wastewater Operators Association—North Central Chapter
(Secretary/Treasurer 1996 to 1999, State Board 1997 to 1999)

Commonwealth of Kentucky Certified Class IVA Water Treatment Plant
Operator and Class IVD Distribution System Operator

KY-TN AWWA “Distinguished Service” Award, 1999

KWWOA Eugene Nichols Award, 2002

PAPERS/PRESENTATIONS/AWARDS:

“Evaluation of the Impact of the Disinfection/Disinfection By-Product Regulations on Kentucky-American Water Company”, 1993 AWWA annual meeting, co-authored with Kevin Dixon (AWWSCo) and Dr. Philip Singer (UNC)

Best Presentation Award, Bluegrass Cross-Connection Prevention Association, 1992

University of Kentucky and Lexington Herald-Leader 1993 “UK Stands Out” series on UK graduates

Best Paper Award, KY-TN AWWA September 2002

Numerous presentations at AWWA and KWWOA sectional meetings

PERSONAL REFERENCES AVAILABLE






Commissioner Training — 2009

6 – Item Six Drinking Water Update – PowerPoint Handouts attached

Drinking Water Update

Northern Kentucky Water District
March 30, 2009


Department for Environmental Protection
Environmental & Public Protection Cabinet

Summary of Presentation

- DEP and DOW Reorganization Update
- KY Drinking Water Regulations
- Drinking Water Compliance & Technical Assistance
- New EPA Regulatory Development
- Capacity Development
- State Revolving Loan/Economic Recovery


2




DEP Organization

- This will address recent changes at the Department level and provide DEP's organizational structure that is relevant to NKWD

3







DOW Organization

- This will address recent changes at the Division level and provide DOW's organizational structure that is relevant to NKWD

4







KY Drinking Water Regulations

- DOW began a process of updating and revising 401 KAR Chapter 8 to streamline adoption of federal EPA rules; this will provide a status on the various regulatory packages that have been submitted or will be submitted in 2009


5






Drinking Water Compliance & Technical Assistance

- An update on activities associated with drinking water compliance and technical assistance activities, including rule development, electronic submittal, Area-Wide Optimization Program



6



New EPA Regulatory Development

- A discussion of new regulatory issues on EPA's agenda, including revisions to the Total Coliform Rule

7



Capacity Development

- This will be an update on DOW's drinking water capacity development program, including the CD strategy and assessment, as well as future direction of the program

8



SRF and Economic Recovery

- State Revolving Loan Funds (SRF) and the proposed economic recovery funds will be discussed

9



Questions?? Comments??

Julie W. Roney
Drinking Water Coordination
KY Division of Water
502/564-3410, extension 4958
Julie.Roney@ky.gov

Kentucky
UNBRIDLED SPIRIT



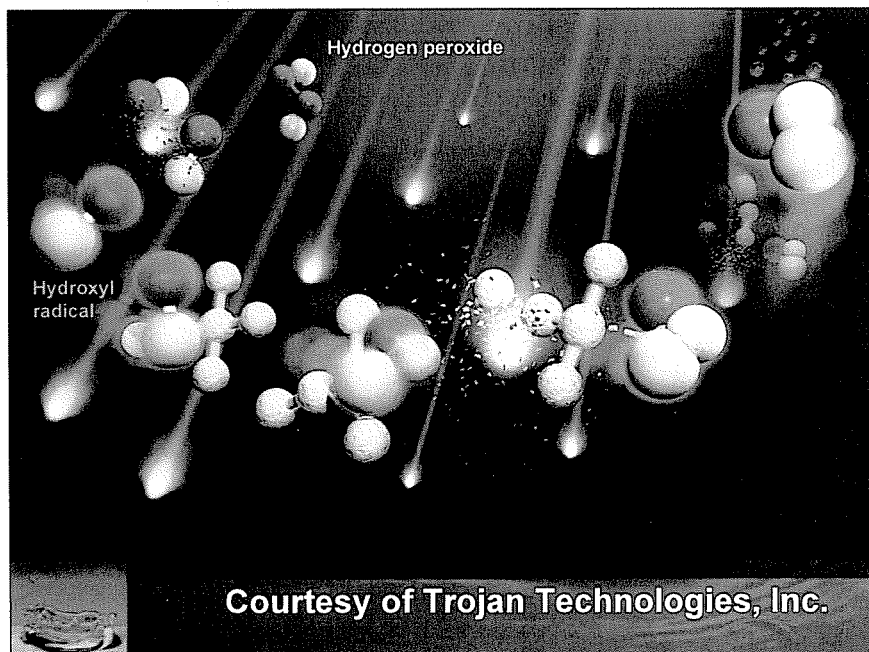
Introduction to UV Advanced Oxidation

What is UV Advanced Oxidation?

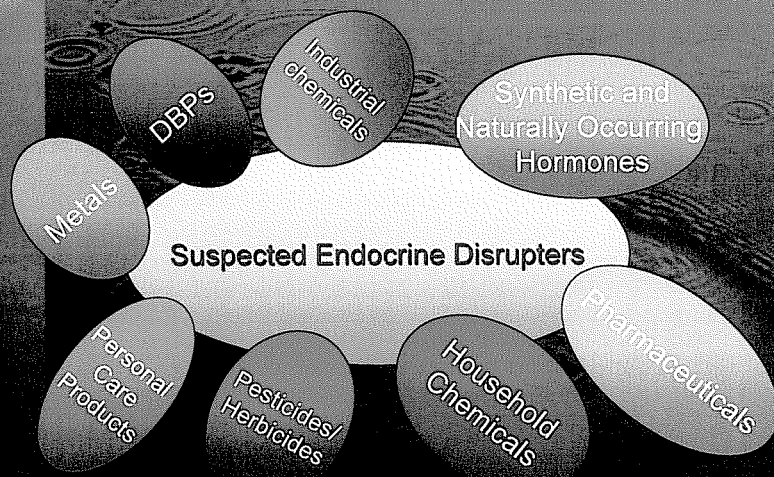
- Definition: water treatment with the use of UV light (photolysis) in combination with hydroxyl radical (advanced oxidation)
- UV light destroys photo-sensitive compounds
- Hydrogen peroxide fed upstream
- Destroys contaminants – other technologies transfer them to another phase
- UV light converts H_2O_2 to OH^\cdot radical:
 - hydroxyl radical = very powerful oxidant

Oxidant	Half-Cell Potential, E°_{red}
Chlorine Dioxide	0.95V
Hypochlorite	1.64V
Permanganate	1.68V
Hydrogen Peroxide	1.78V
Ozone	2.08V
Hydroxyl Radical	2.85V

Source: *Water Quality and Treatment*, 5th Ed. p.12.3



Compounds of Potential Concern



Courtesy of Professor Jorg Drewes, Colorado School of Mines

Impact of UV and UV/H₂O₂ AOP on EDC Activity in Water (Source: AwwaRF¹)

- UV disinfection doses are not effective at removing estrogenic contaminant activity
- UV doses at 10-100x disinfection doses are also not effective
- Use of UV + H₂O₂ can be very effective for treatment of estrogenic compounds
- No appreciable difference between LP and MP UV lamps
- H₂O₂ doses between 2 and 10 mg/L are effective
- UV doses should be at least 200 mJ/cm² and as high as 1000 mJ/cm² to achieve effective treatment
- Water quality has a large effect on UV-AOP process efficiency

Footnote:
1 K. Linden and S. Kullman, 2007. AwwaRF Report 91175.

Effectiveness of UV and UV AOP (Source: AwwaRF¹)

5 mg/L H₂O₂ + UV Dose of 372 mJ/cm²

> 80% Removal 50-80% Removal 20-50% Removal <20% Removal
Acetaminophen Androstenedione Meprobamate TECP
Carbamazepine Atrazine
Diclofenac Caffeine
Dilantin DEET

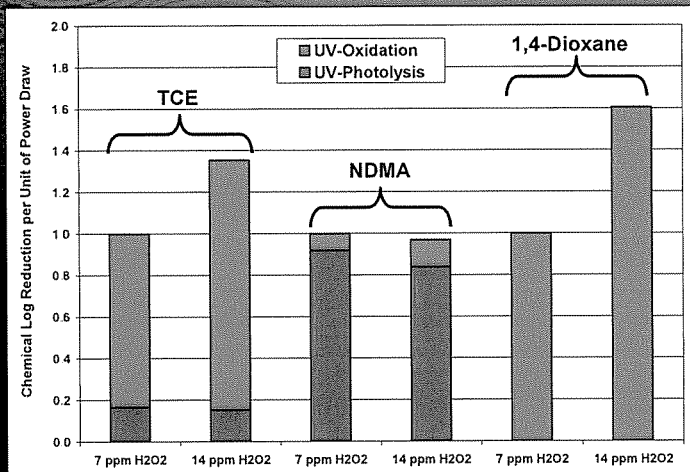
Estradiol Diazepam
Estril Erythromycin
Estrone Iopromide
Ethinyl estradiol Pentoxifylline
Fluoxetine
Gemfibrozil
Hydrocodone
Ibuprofen
Naproxen
Oxybenzone
Progesterone
Sulfamethoxazole
Testosterone
Triclosan
Trimethoprim

UV Dose of 439 mJ/cm² (No H₂O₂)

> 80% Removal	50-80% Removal	20-50% Removal	<20% Removal
Acetaminophen	Atrazine	Carbamazepine	Androstenedione
Diclofenac	Dilantin	Gemfibrozil	Caffeine
Estradiol	Erythromycin	Ibuprofen	DEET
Estril	Iopromide	Pentoxifylline	Diazepam
Estrone		Progesterone	Meprobamate
Ethinyl estradiol		Testosterone	TECP
Fluoxetine		Trimethoprim	
Hydrocodone			
Naproxen			
Oxybenzone			
Sulfamethoxazole			
Triclosan			

1 S. Snyder, et al., 2007. "Removal of EDCs and Pharmaceuticals in Drinking and Reuse Treatment Processes. AwwaRF Report 91188.

Must Consider the UV-Photolysis/UV-Oxidation Balance for UV-AOP



Courtesy of Trojan Technologies, Inc.

Potential Applications and Issues for UV-AOP

Applications:

- Nitrosamines (NDMA)
- Taste and odor-causing compounds (MIB and geosmin)
- Control of CPCs
- High-bromide waters
- Applications for above contaminants together with need for *Cryptosporidium* barrier
- Public acceptance

Issues:

- Doses 1-2 orders of magnitude greater than UV disinfection
- Peroxide quenching
- WQ info even more critical to cost (UVT and scavenging demand for OH[•])

Emerging Pollutants of Concern:

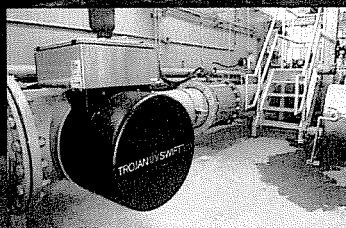
- N-nitrosodimethylamine (NDMA)
- 1,4-Dioxane
- Pesticides & herbicides (e.g., atrazine & simazine)
- Petroleum additives (MTBE, BTEX, etc.)
- Taste & Odor
- Pharmaceuticals and personal care products
- Endocrine disruptor chemicals
- Volatile organic chemicals (VOCs)

Disinfection is also achieved

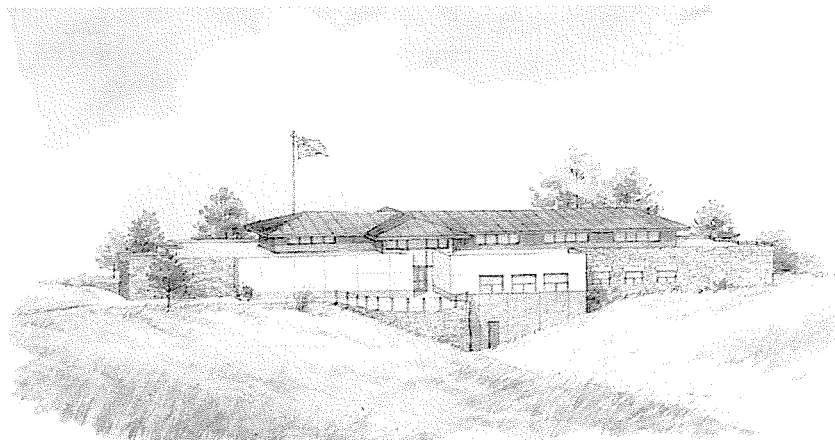
Courtesy of Trojan Technologies, Inc.

UV AOP Track Record for Potable Water

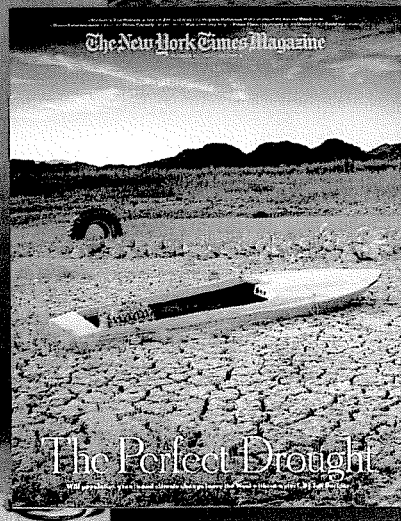
- PWN Facility in Netherlands:
 - UV AOP for micro-pollutants and taste and odor control
 - Startup in October 2004, 25 mgd capacity
- OCWD Groundwater Replenishment System in California:
 - Designed for 1.2-log NDMA removal
 - 9-mgd train began operating in 2004
 - Construction recently completed for 70 mgd capacity
- Cornwall, Ontario:
 - 26-mgd system for taste and odor control
 - Currently operating
- Today's Case Studies



Case Study: Aurora Prairie Waters Project 50-MGD Aurora Reservoir Water Purification Facility

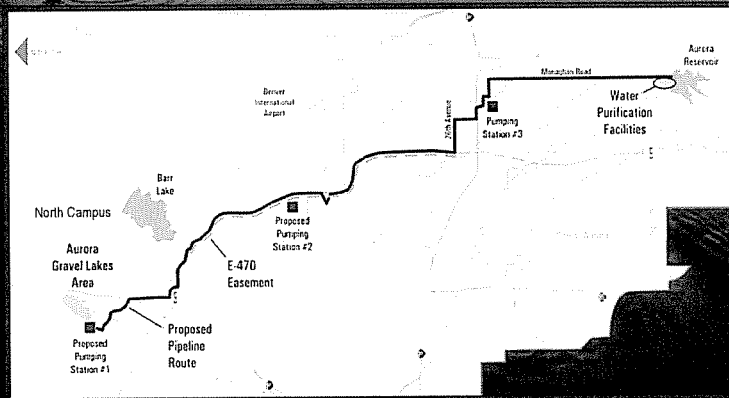


Why is the PWP Critical to Aurora? Water Supply Outlook for 2006-2010



- If wet conditions occur – Aurora will have adequate supplies to meet demands.
- If dry conditions occur – Aurora will have to reduce demands, and/or look to short-term leases to boost water supplies.
- 2010 – Prairie Waters Project will add yield to the system, reduce the potential for water shortages.

Prairie Waters Project



- 34 miles of 60-inch pipeline
- 3 pumping stations
- North Campus (bank filtration and aquifer recharge and recovery)
- 50-mgd water purification facility

Supported by Community Leaders and Public Officials

"This is the wave of the future. ... Aurora is leading the charge."

Glenn Bodnar (Drinking Water Division Manager for Colorado Division of Public Health and Environment)

DENVER & THE WES

Mail-in ballot woes criticized

TAPPING USED WATER

Rev of a clean office

Key Challenges for the New Supply

- Pathogens
 - Regulation-driven
 - 2.5-log *Cryptosporidium* inactivation
- Control of Organics (Micro-Pollutants)
 - Not yet regulation-driven (consumer acceptance issue)
 - More individual compounds than can be reasonably measured
- Hardness
 - Need to match existing supply (~150 mg/L)
- TDS
 - Goal of 400 mg/L based on taste testing
- Nitrate
 - Match existing supply (<<2 mg/L)

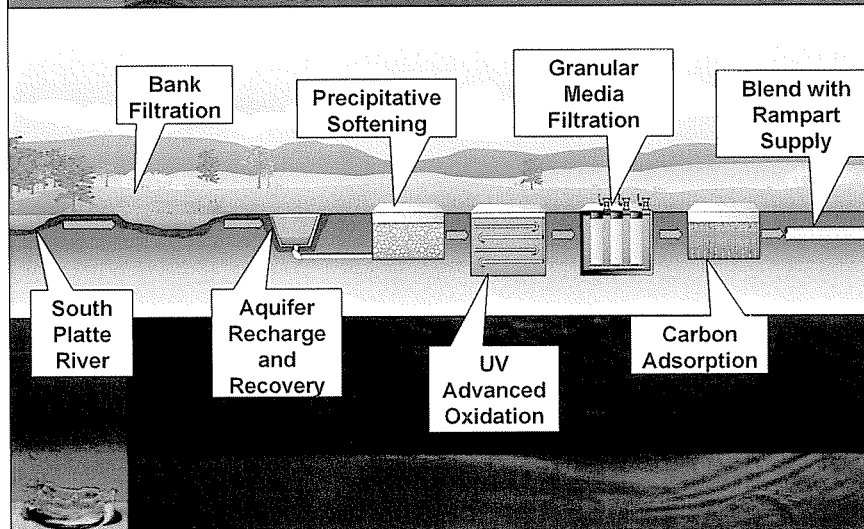
Comparison of Quality of Aurora's Water Supplies

Water Quality Parameter	Rampart Reservoir (average values)	South Platte River (typical values)
Phosphorus (mg/L)	0.015	0.5 - 2
Ammonia (mg/L)	0.14	1.5 - 5
Nitrate (mg/L)	0.05	2 - 7
Biochemical Oxygen Demand (BOD) (mg/L)	<2	6 - 16
Dissolved Organic Carbon (DOC) (mg/L)	<2	6 - 9
Fecal Coliform (colonies/100 mL)	8	20 - 800
E coli (Colonies/100 mL)	<10	<10 - 300
Total Dissolved Solids (TDS, mg/L)	150 to 200	400 - 800
Turbidity (NTU)	0.5 - 8	10 - 20
<i>Cryptosporidium</i>	Low Risk (BIN 1)	High Risk (BIN 4)

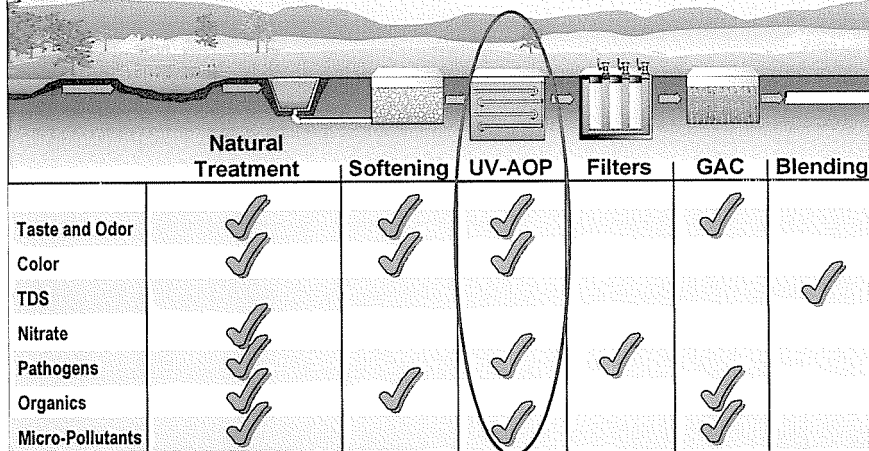
Aurora's Water Quality Goals

- Nitrate < 2 mg/L
- TDS < 400 mg/L
- Hardness < 150 mg/L as CaCO_3
- TOC < 4 mg/L
- DBP concentrations no more than current supply
- Reduce concentrations of micro-pollutants, nitrosamines, and pharmaceuticals to concentrations comparable to current supply
- Use sustainable purification solutions

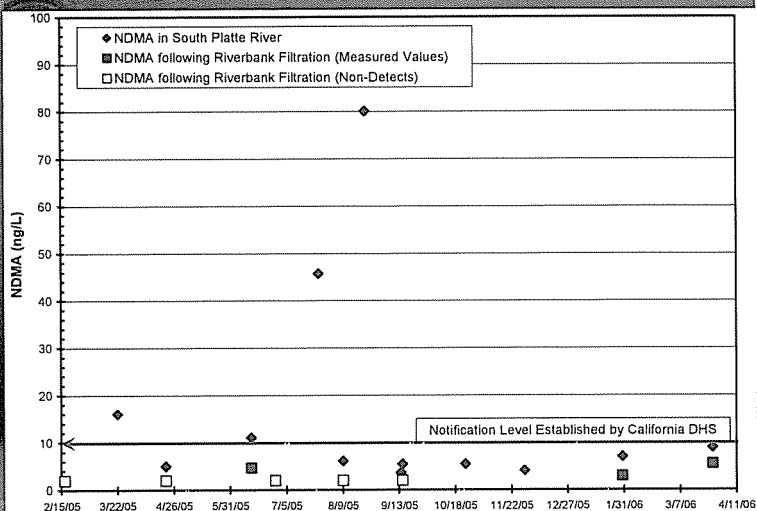
Preferred Purification Strategy



Combining the Best of Natural and Engineered Purification Steps as Multiple Barriers



NDMA Sampling Results - Riverbank Filtration



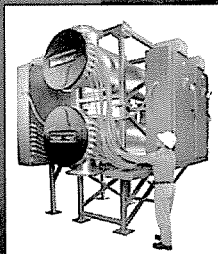
South Platte River Sampling Results Show NDMA is Most Prevalent Nitrosamine

Date	NDMA (ng/L)	NMEA (ng/L)	NDEA (ng/L)	NDPA (ng/L)	NMOR (ng/L)	NPYR (ng/L)	NPIP (ng/L)	NDBA (ng/L)	NDPH (ng/L)
22-Mar-05	16.0	--	--	--	--	--	--	--	--
21-Apr-05	5.0	--	--	--	--	--	--	--	--
13-Jun-05	11.0	--	--	--	--	--	--	--	--
28-Jun-05	<2.0	--	--	--	--	--	--	--	--
25-Jul-05	45.7	--	--	--	--	--	--	--	--
9-Aug-05	6.1	--	--	--	--	--	--	--	--
23-Aug-05	80.0	<3.0	<3.0	<3.0	--	<3.0	<3.0	<3.0	--
14-Sep-05	3.6	<3.0	6.2	<3.0	--	<3.0	3.2	<3.0	--
15-Sep-05	5.4	--	--	--	--	--	--	--	--
24-Oct-05	5.4	<3.0	<3.0	<3.0	--	<3.0	<3.0	<3.0	--
30-Nov-05	4.0	<3.0	<3.0	<3.0	--	<3.0	<3.0	<3.0	--
30-Jan-06	7.0	<3.0	49.5	<3.0	14.5	6.9	6.5	<3.0	6.1/<3.0
27-Mar-06	9.0	<3.0	<3.0	<3.0	10.4	9.7	18.5	3.0/<3.0	<3.0

NDMA Is One of Several Nitrosamines

- EPA's Unregulated Contaminant Monitoring Rule 2 Includes NDMA plus 5 Others:
 - N-nitrosodiethylamine (NDEA)
 - N-nitrosomethylethylamine (NMEA)
 - N-nitrosodi-n-butylamine (NDBA)
 - N-nitrosodi-n-propylamine (NDPA)
 - N-nitrosopyrrolidine (NPYR)
- California DPH Set Notification Levels for:
 - NDEA
 - NDPA
- Others Identified as Potential Health Risks:
 - N-nitrosodiphenylamine (NDPhA)
 - N-Nitrosodiethanolamine
 - N-nitrosopiperidine (NPIP)
 - N-nitrosomorpholine (NMOP)

UV/AOP is Best “Man-made” Approach for NDMA Destruction



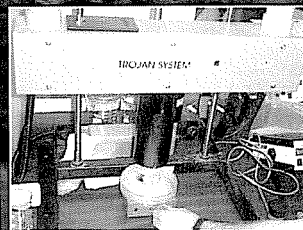
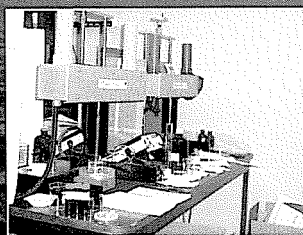
- NDMA has unique properties:
 - air stripping ineffective
 - small molecule \leftrightarrow RO moderate removal at best
 - hydrophilic \leftrightarrow GAC adsorption ineffective
 - not destroyed by oxidation \leftrightarrow ozone ineffective
- NDMA is highly sensitive to photolysis by UV light

Treatability Testing Goals

- Provide data to refine ARWPF design criteria and estimated costs
- Evaluate efficacy of:
 - Enhanced coagulation/softening
 - UV advanced oxidation
 - GAC adsorption processes
- Confirm water quality capabilities of treatment processes
- Necessary to spike compounds for meaningful results

UV Advanced Oxidation Test Strategy

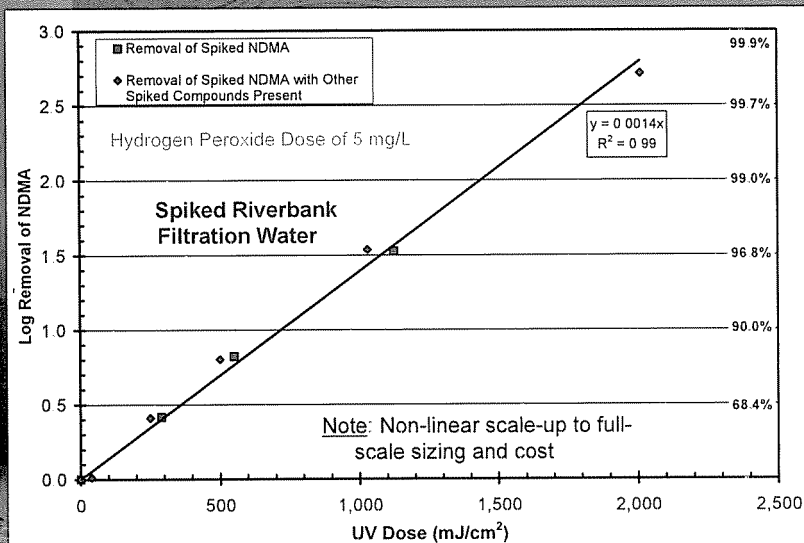
- Collimated Beam devices for UV dosing (2 in parallel)
- Testing at CH2M HILL's Applied Sciences Laboratory
- Increased concentration of key compounds in RBF water by "spiking"



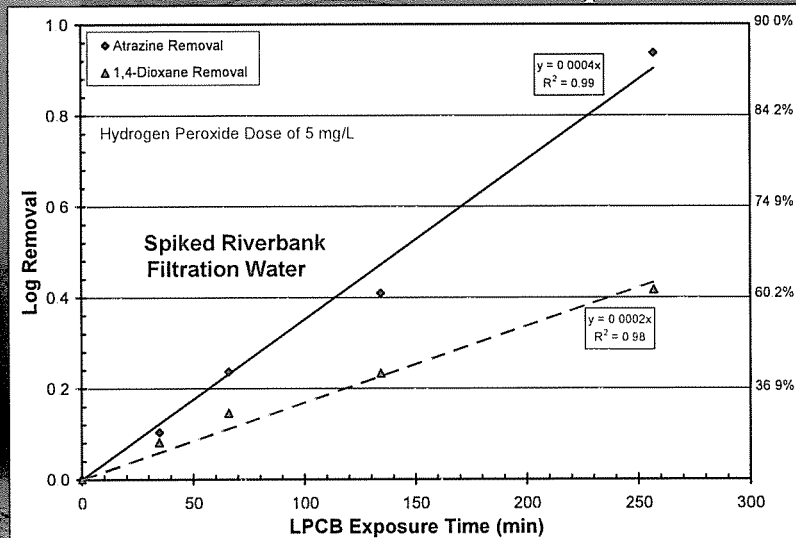
UV Advanced Oxidation Process Testing

- Kinetics of destruction using spiked compounds:
 - NDMA
 - Atrazine
 - 1,4-Dioxane
 - MS2 phage
 - Taste and odor causing compounds
- DBP formation (including bromate and BDOC)
- Peroxide residual quenching
- Sampling for background micro-pollutants and removal thru treatment

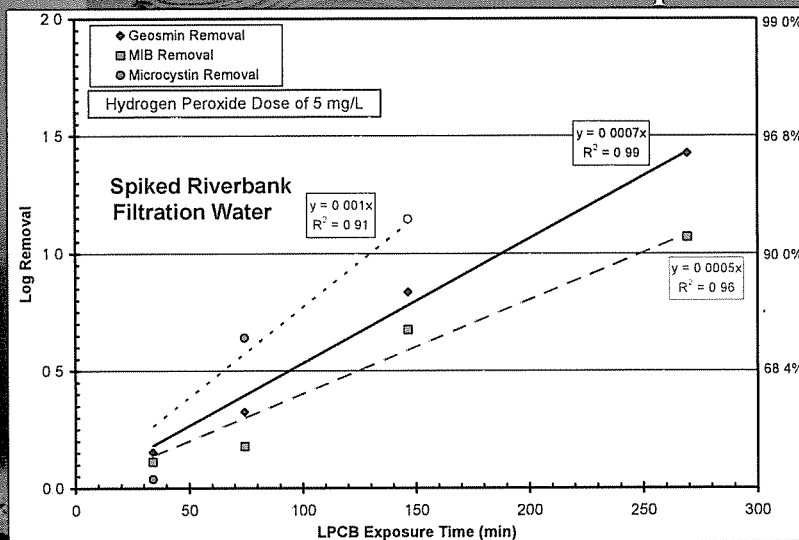
NDMA Removal with UV AOP



UV AOP Removes Micro-pollutants

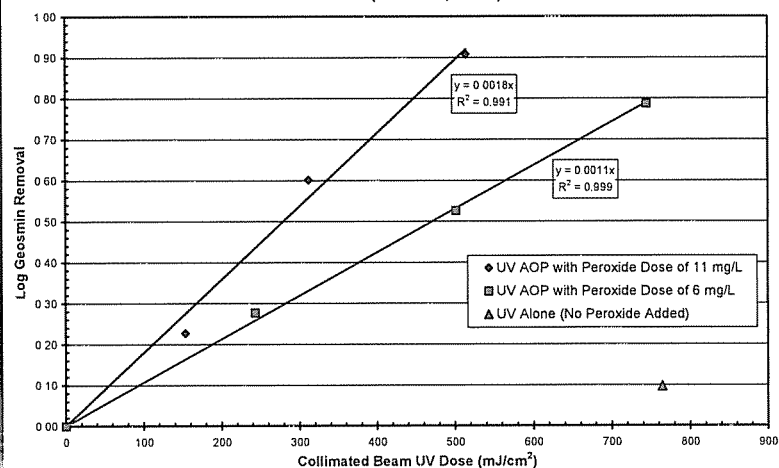


UV AOP Removes T&O Compounds

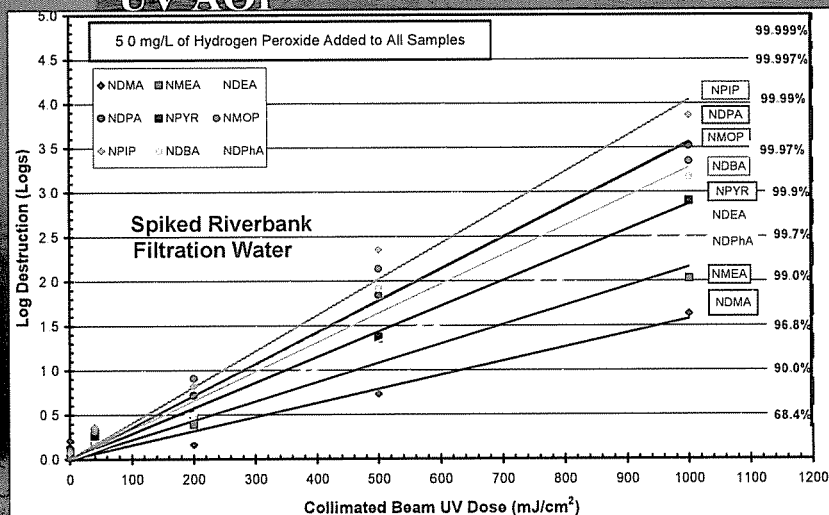


UV AOP Treatability Testing

FIGURE 2: Lake Skinner Water: UV AOP Performance for Geosmin Removal (March 1, 2005)



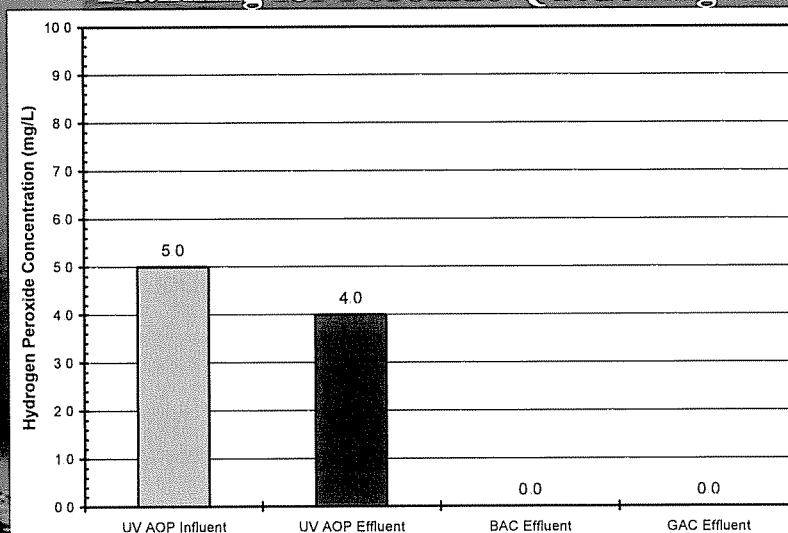
Destruction of Nine Nitrosamines by UV AOP



UV AOP – Minimal By-Product Formation

- No bromate formation (< 0.5 µg/L reporting limit)
- Biodegradable organic carbon (BDOC):
 - present after UV-AOP (0.24 mg/L)
 - stabilized after GAC (not detected following 5 minute empty bed contact time)

UV AOP Implementation Requires Planning for Peroxide Quenching



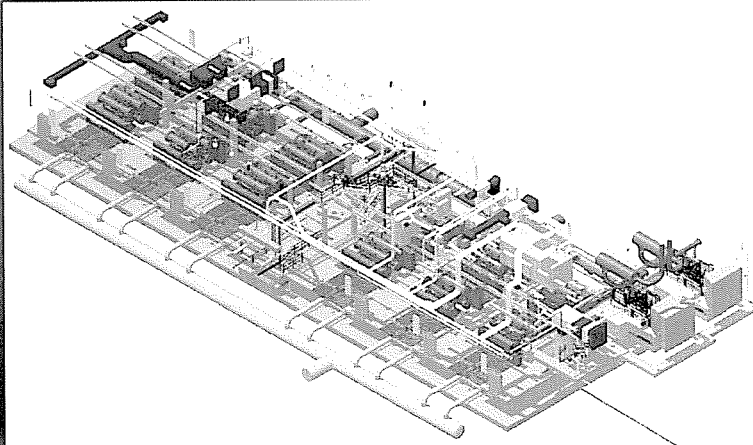
Treatability Testing: UV AOP Key Findings

- Regulated DBPs were not formed
- Peroxide quenching is key issue for implementation
- At UV dose for 1.2-log NDMA destruction and with 5 mg/L hydrogen peroxide would also:
 - reduce geosmin from 40 to 10 ng/L
 - reduce MIB from 21 to 10 ng/L
 - reduce microcystin by 86 percent

UV AOP Design Criteria

- 50 mgd peak flow
- 5 mg/L H_2O_2 dose
- 12 trains of 4 UV chambers each
- LPHO UV lamps for year-round operation
- 85% UVT
- 1.2-log NDMA destruction
- EE/O = 0.72 kW-hr/1000-gal per order NDMA
- UV after clarification, but before filtration
- Peroxide quenching with BAC and GAC
- \$200M WTP startup in 2010

UV-AOP System



UV AOP is a Key Component of Aurora Water's Multiple Barrier Approach

- Protects public health through destruction of NDMA and other micro-pollutants
- NDMA destruction was predictable and repeatable
- Destruction of other nitrosamines exceeded destruction of NDMA at same UV dose
- For nitrosamines, NDMA is conservative indicator, both for presence and removal
- Sustainable approach uses destruction and not transfer or discharge

Testing of Natural and Engineered Purification Systems

Purification Challenge

Representative Compounds

Blood Lipid Regulators & Metabolites	Clofibric acid
Antiphlogistics/Anti-inflammatories	Fenofibrate
Flame Retardants	Genfibrozil
Pesticides	Naloxone
Antiepileptics	Ketoprofen
Plasticizers	Dichlorodiphenylmethane
Antibiotics	Carbamazepine
	Primidone
	Bisphenol A
	Tetracycline
	Erythromycin

Granular Activated Carbon (GAC)

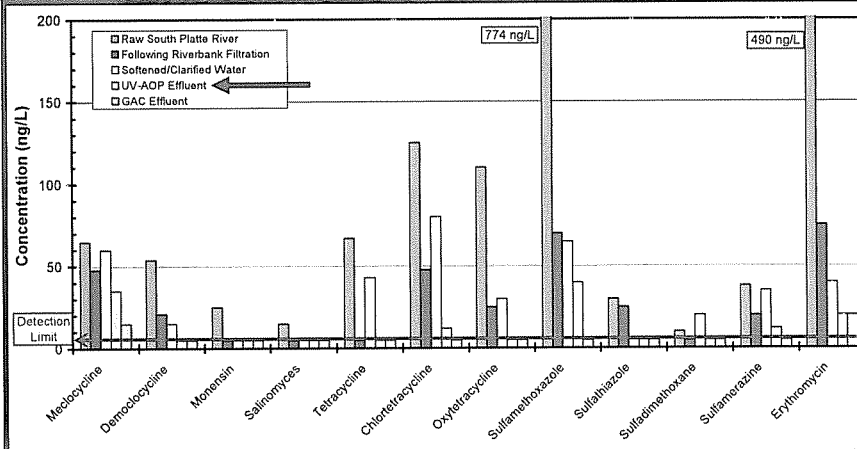
- Final "polishing" step in the multiple barrier approach
- Micro-Pollutants
 - Broad effectiveness
 - Best barrier for refractory compounds like chlorinated flame retardants
- Performance can be adjusted operationally by changing GAC replacement frequency to meet requirements
- RSSCT demonstrated anticipated replacement frequency of 9-12 months at average flow

Micropollutant Removal with GAC

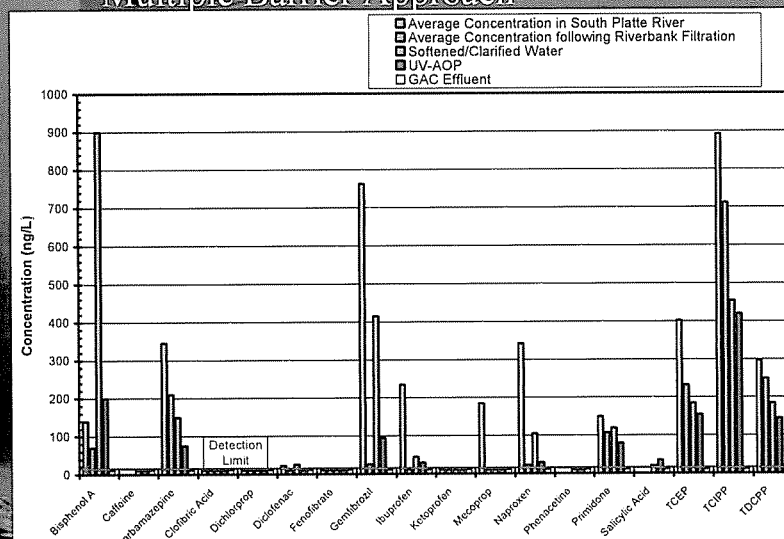
Micro-Pollutant	Influent Concentration (ng/L)	Effluent Concentration (ng/L)
Atrazine	650	6.1
Metolachlor	122	<10.0 (BDL)
Caffeine	.17	3.1
Sulfamethoxazole	6.0	<1.0 (BDL)
Iopromide	3.3	<1.0 (BDL)
Carbamazepine	2.2	<1.0 (BDL)
TCEP	2.0	1.3
Erythromycin-H2O	1.8	<1.0 (BDL)
Dilantin	1.8	<1.0 (BDL)
DEET	1.8	<1.0 (BDL)
Meprobamate	1.2	<1.0 (BDL)
Gemfibrozil	1.2	<1.0 (BDL)
Ibuprofen	1.1	<1.0 (BDL)
Oxybenzone	1.0	<1.0 (BDL)

(Westerhoff and Snyder, 2003)

Results Demonstrate Effectiveness of Multiple Barrier Approach



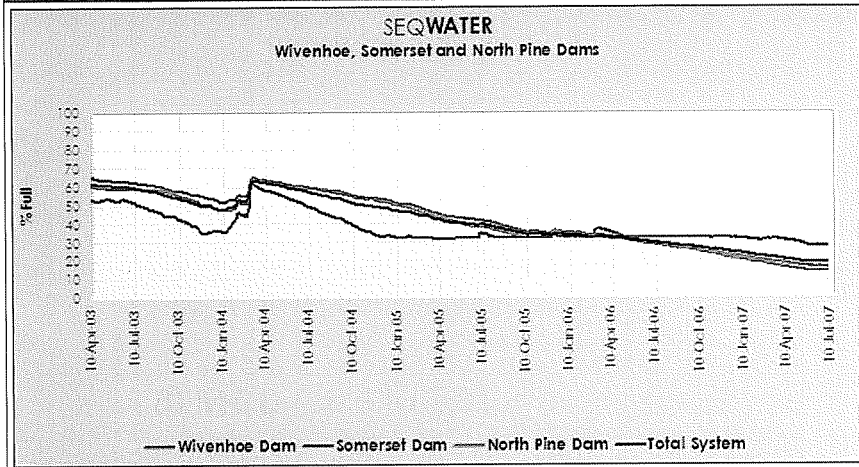
Results Demonstrate Effectiveness of Multiple Barrier Approach



Case Study: Brisbane, Australia Luggage Point Advanced Water Treatment Plant

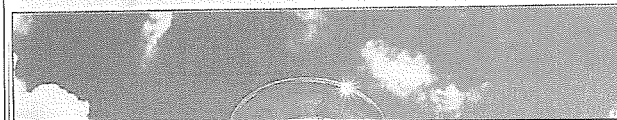
70 MLD (18.5 MGD)

Southeast Queensland Water Supply Planning



The Saturday
Daily Telegraph
January 27, 2007
SYDNEY FESTIVAL 2007
Daily Telegraph
SPECIAL SUPPLEMENT
\$1.00 inc. GST CF

DRINK THIS AUSTRALIA

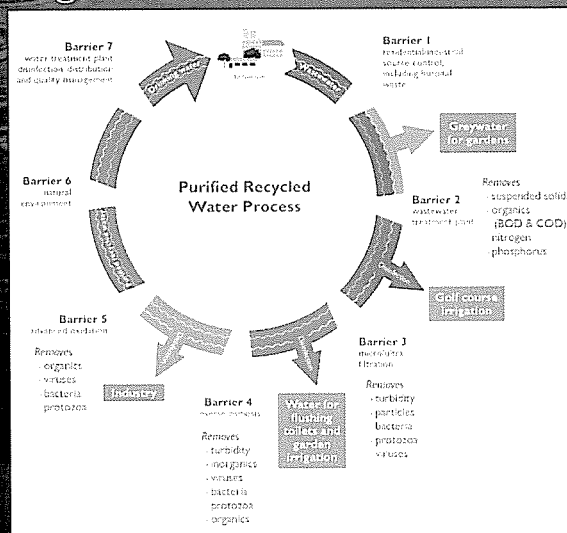


Sewage the
answer to
water crisis

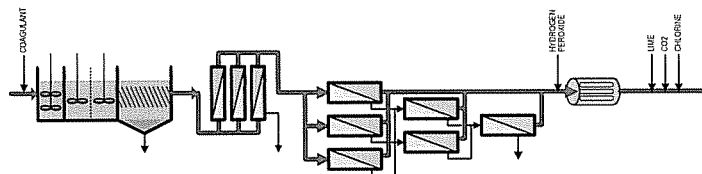
Project Overview

- Project Goal: Reduce pressure on existing water supplies by providing purified recycled water for drinking and industry use
- The project will be the largest recycled water scheme of its-kind in the Southern Hemisphere
 - Capacity to supply more than 200 megalitres ML/d
 - 200km of underground pipeline, up to 1.5m-in diameter, will be built
- Six existing wastewater treatment plants feeding three new advanced water treatment (AWT) plants, including Luggage Point AWT

Southeast Queensland Water Supply Planning



Treated Water – Processes & Drivers



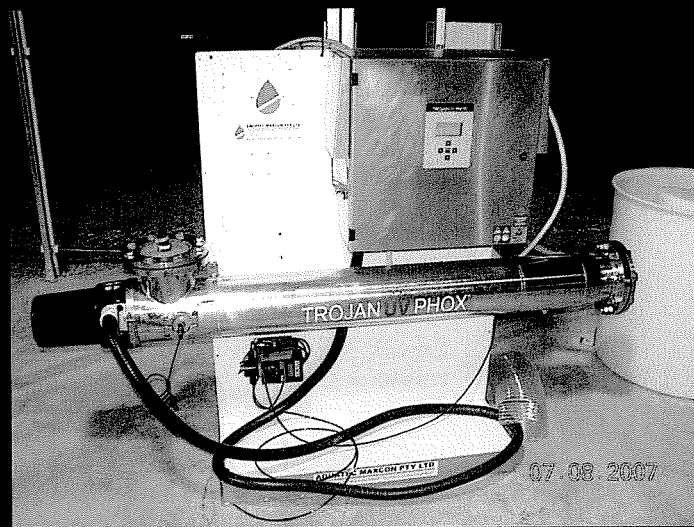
- Health
 - Multiple barriers to pathogens – MF, UV, Chlorine
 - Emerging Contaminants – RO, Advanced Oxidation
- Storage & Health
 - Nutrient reduction – Reverse Osmosis
- Dissolved Solids reduction
 - Reverse Osmosis
- Materials compatibility
 - Stabilisation, (Lime + Carbon Dioxide)

Luggage Point Pilot Plant Incorporates All Main-Stream Unit Processes



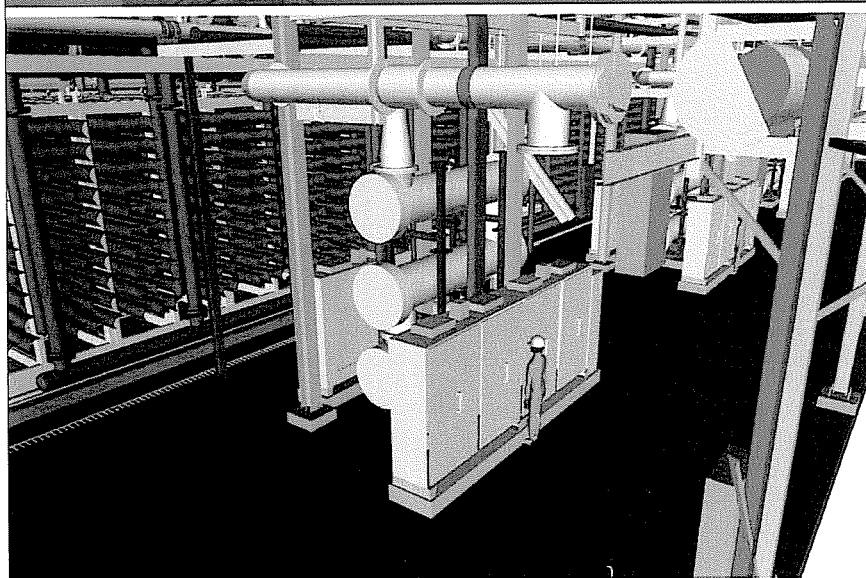
07.10.2007

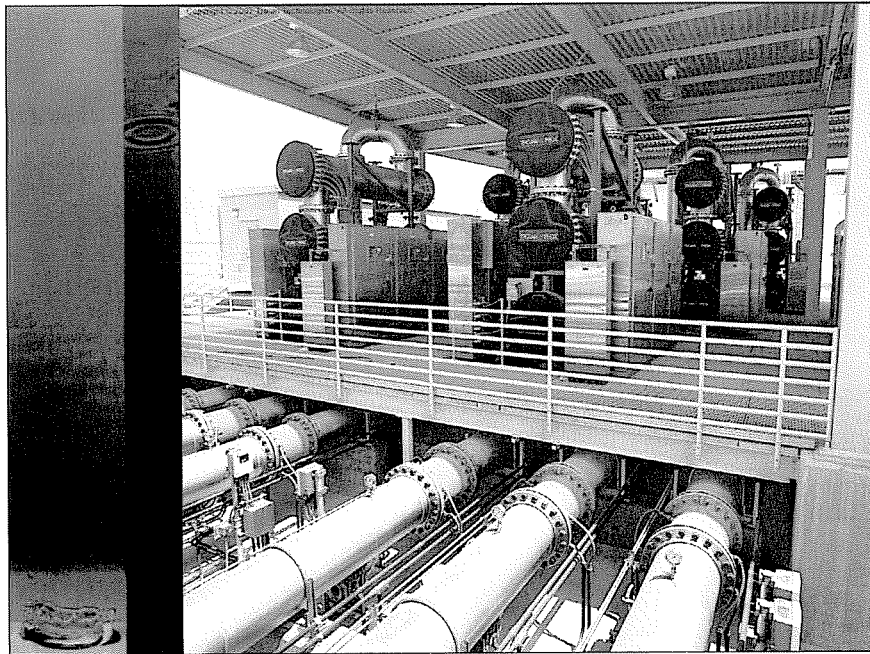
Pilot UV System/AOP System



07.08.2007

Full-Scale UV-AOP System

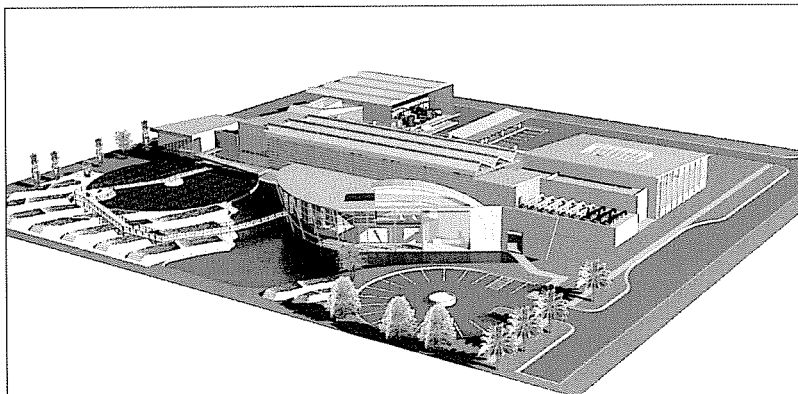




**Case Study: Oxnard, California
GREAT Program, Phase 1**

6.25 MGD

Oxnard GREAT Program

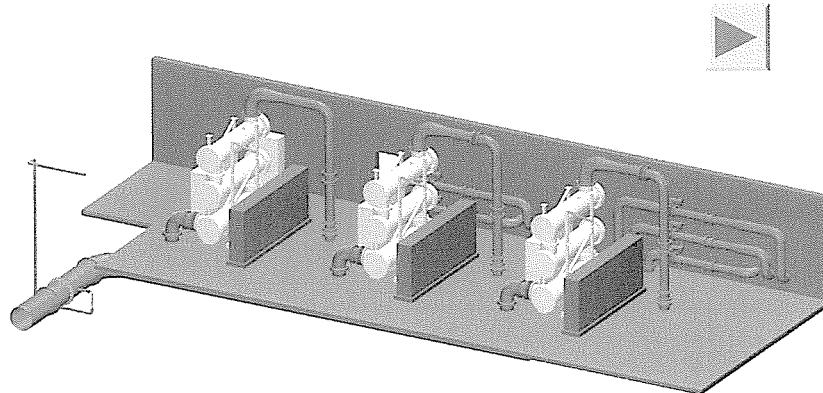


Oxnard GREAT Program Test Results: Spiked NDMA and 1,4-dioxane

NDMA (NG/L)							1,4-DIOXANE (µG/L)						
RAW	SPIKED	PERM	CONC	FEED	CF	%REJ	RAW	SPIKED	PERM	CONC	FEED	CF	%REJ
33.2	102	82.4	133	98.8	1.35	19	1.32	1.62	0.48	4.18	2.32	1.80	70
NDEA (ng/L)							NDPA (ng/L)						
RAW	SPIKED	PERM	CONC	FEED	CF	%REJ	RAW	SPIKED	PERM	CONC	FEED	CF	%REJ
15.8	17.4	1.07	1.07	15.6	0.07	94	1.06	1.07	1.07	1.07	1.07	-	-

Notes:
 Perm – Permeate
 Conc – Concentrate
 CF – Concentrate Factor (Conc/Feed)
 (%Rej) – Percent Rejected (1-Perm/spiked)

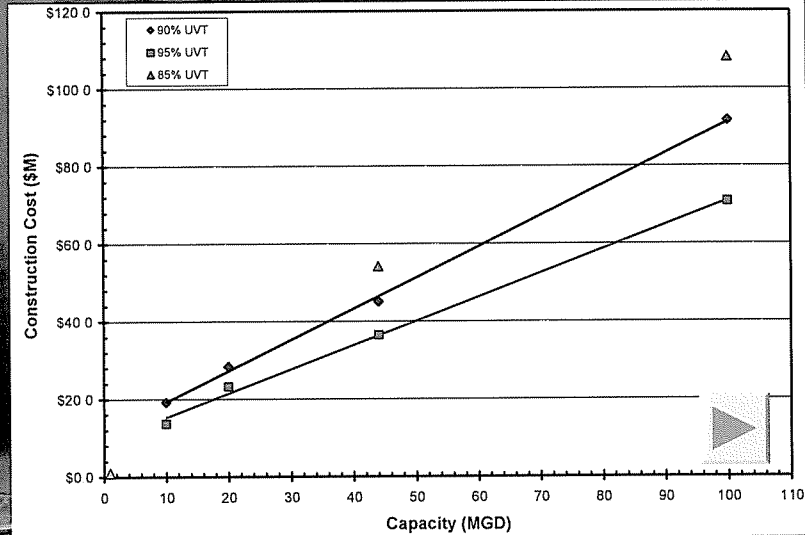
Oxnard UV-AOP System Layout



Summary of UV-AOP Case Study Information

Project	Capacity (mgd)	Design UVT	UV Lamp Technology	# Trains	Total # Chambers	Equipment Cost (UV)	UV System Cost	Peroxide Quench
Oxnard, CA Luggage Point (AU)	6.3	95%	LPHO	1	3	\$1,530,000	\$5,460,000	Chemical
Aurora, CO	18.5	95%	LPHO	4	12	\$5,490,000	n/a	Injection
	50.0	85%	LPHO	12	48	\$14,370,000	\$30,000,000	BAC

Summary of UV-AOP Capital Cost Information



Peroxide Quenching Options

- Chemical quenching:
 - free chlorine
 - sodium bisulfite
- Chlorine to peroxide exceeds stoichiometric ratio:
 - 3:1 in lab tests
 - for 20 mgd average flow, 5 mg/L peroxide dose, annual quench cost is \$560k/yr
- Biological destruction

What Is Best Location for UV-AOP?

- Before GAC?
 - Prefer filtration prior to UV-AOP
 - No chemical quenching required
- After GAC?
 - UVT increases through GAC
 - Capital and O&M costs are optimized with UVT as high as possible
 - Chemical quenching required if after GAC
 - Impacts on distribution system stability

UV-AOP Offers Key Benefits for Water Treatment

Disinfectant	Residual	Virus	Giardia	Cryptosporidium	Taste and Odor	Oxidation
Chlorine	√√	√√	√			√
Chloramine	√√	√				
Ozone		√√	√√	√	√√	√√
Chlorine Dioxide	√	√	√	√	√	√
UV		√	√√	√√		
UV-Peroxide		√√	√√	√√	√√	√√

UV Advanced Oxidation – Applications, Issues, and Considerations for the NKWD

Northern Kentucky Water District

Thursday, September 17th, 2009

Nick Winnike, P.E., CH2M HILL



Commissioner Training — 2009

7 – Item Seven No.



Commissioner Training — 2009

1 – Item One Northern Kentucky Water District
2835 Crescent Springs Road
P.O. Box 18640
Erlanger, KY 41018



Commissioner Training — 2009

2 – Item Two Name: Construction Contract Administration

Sponsor: Jordan, Jones, & Goulding, Inc.

Subject Matter: Tips to keep the plant online while avoiding contract litigation.



Commissioner Training — 2009

- 3 – Item Three The purpose of this presentation is to inform the Board of Commissioners about construction management issues and processes including: procedures, workflows, technology, and scheduling.



Commissioner Training — 2009

- 4 – Item Four One Credit Hour – Copy of Board Minutes showing Commissioners attendance will be attached after April 16, 2009 meeting.



Commissioner Training — 2009

5 – Item Five Mr. Robert F. Wierzbicki, P.E., Director of Construction Services Discipline,
Jordan, Jones, & Goulding, Inc.

Bio of the presenter is attached.

Robert F. Wierzbicki, P.E.

Mr. Wierzbicki serves as Director of JJG's Construction Services Discipline. Mr. Wierzbicki has more than 30 years of extensive experience in construction and project management including construction administration, cost estimating, change order review and evaluation, claims analysis and negotiation, scheduling, plant operation and training, and construction personnel management. Mr. Wierzbicki oversees the firm's policies and procedures in the administration and management of construction projects and works directly with JJG's Construction Services personnel in their professional development and training in the aspects of how to manage projects with emphasis on claims mitigation and avoidance techniques, including project scheduling and documentation.

Previously, Mr. Wierzbicki was assigned as the Senior Resident Project Manager, for JJG, on the \$120-million Town Creek Water Treatment Plant for Macon Water Authority, Macon, GA. Before that, he was president of EnviroStructures Contracting Company, Camden, NJ, specializing in the construction of water and wastewater treatment facilities; he has also served in senior management positions for construction firms located in the Eastern Pennsylvania area constructing water and wastewater facilities in the mid-Atlantic region.

Project Experience

- Construction Project Manager for fast-track construction associated with the installation of owner (federal government) pre-purchased process equipment for groundwater remediation. The site was located adjacent to a dump site of unexploded munitions including chemical and incendiary devices. The project featured an insulated and heated process conveyance piping system with connection to an extensive array of extraction wells, influent equalization, air stripping, chemical feed systems, and river outfall and diffuser system. Aberdeen Proving Grounds, Aberdeen, Maryland.
- Project Manager for fast-track construction associated with the installation of owner pre-purchased process equipment for groundwater remediation. Site was located adjacent to dump site of unexploded munitions including chemical and incendiary devices. Project featured connection of 16 extraction wells, 7,500 l.f. of insulated conveyance piping system, influent equalization, air stripping, chemical feed systems, and river outfall and diffuser system. Old O-Field Groundwater Treatment Plant, Aberdeen Proving Grounds, Aberdeen, Maryland
- Senior Resident Project Manager for a \$120-million water treatment facility. The facility is located on a "greenfield" site and involved seven individual construction contracts and six material procurement contracts. The constructed facilities include a river intake and pump station, raw water transmission mains, reservoir intake structure and pump station, water treatment plant, and finished water transmission mains.

Title

Director, Construction Services

Years of Experience

30

Education

B.E., with Honors, Civil Engineering,
Stevens Institute of Technology, 1975

Professional Registration

Professional Engineer in New Jersey and
Pennsylvania

Office Location

Atlanta, Georgia





- President of EnviroStructures Contracting Company, Camden, New Jersey. Construction of new wastewater treatment facilities for a \$150-million industrial expansion of an existing ethanol and fructose syrup manufacturing facility located in Marshall, Minnesota. The project included the installation of process treatment equipment systems (anaerobic digesters and sequencing batch reactors) including pumps, blowers, chemical feed and storage facilities, process tanks, associated mechanical piping systems, reinforced concrete foundations, and heating and odor control systems.
- Construction Project Manager for the construction of a new sludge incineration system. The system consisted of a multiple hearth furnace, venturi scrubber, aftercooler, wet electrostatic precipitator, fans and blowers, ducts, dampers and stacks, ash handling system, pumps and piping, instrumentation and controls, and a regenerative thermal oxidizer. In addition to the incineration facility, the project also included sludge storage and mixing systems, sludge dewatering equipment, live-bottom dry sludge cake receiving facility, sludge cake feed pump systems, polymer batching and feeding systems, and odor control equipment. The completed project received an engineering excellence award from the Commonwealth of Pennsylvania. Hatfield, Pennsylvania.
- Construction Project Manager for the upgrade of an existing wastewater treatment plant from 4 to 8-mgd, involving over 12,000 cubic yards of reinforced concrete for treatment unit tanks and structures, major site work including structure excavation and backfill, bituminous roadways, site piping, and site grading. New facilities installed included raw wastewater pumps and variable-speed controls, primary clarifiers, oxidation ditch, secondary clarifiers, waste sludge and return sludge pumping facilities and controls, chlorine contact tank, chlorination and chemical feeds facilities and sludge dewatering facilities. New Britain, Pennsylvania.
- Senior Plant Operator for a 12-mgd regional advanced wastewater treatment facility. Provided start-up and commissioning and full-time operation of new regional “greenfield” plant facility. Services included development and coordination of training programs to train the Owner’s personnel in the operation and maintenance of all unit processes and plant components, as they were hired. The facility included an on-site oxygen generating system, grit removal facilities, UNOX aeration basins, primary and secondary clarifiers, pressure filters for tertiary treatment, waste activated and return sludge pumping systems, aerobic digesters, sludge holding tanks, fluidized bed incinerator, vacuum filters, polymer and chemical feed systems, and sodium hypochlorite generation facilities.
- Construction Project Manager for the upgrade of existing clarification and sludge pumping facilities. Facilities were part of the American Cyanamid Advanced Wastewater Treatment System. Project included the construction of new waste and return sludge pumping and control systems, six new 110-foot-diameter secondary clarifiers and chlorine storage and feed facilities. Extensive modifications to and construction of new HVAC, plumbing, electrical, and instrumentation systems were part of the scope of work. Specialty remedial work involving asbestos encapsulation also was required. All aspects of the project were phased to maintain the existing treatment plant in operation at all times. Bridgewater, New Jersey.
- Construction Project Manager for construction of treatment plant upgrades to increase the operating capacity of an existing water plant to 4 MGD. Construction services included the supply, installation, and interconnection of raw water pumps and control system; in-line rapid mix system; chemical feed facilities; flocculation equipment; tube settlers and automated sludge removal system; sludge storage and thickening facilities; carbon storage and feed silo; filter reconstruction; new administration building and laboratory facilities; and fully automated computer control system. Carlisle, Pennsylvania.
- Construction Project Manager for the construction of several leachate pretreatment systems at various locations. Facilities installed and constructed included aerobic biological treatment, primary and secondary clarification, sludge storage and dewatering, chemical feed systems, access platforms and



walkways, and HVAC, plumbing and electrical systems. Clinton County Solid Waste Authority, McElhatten, Pennsylvania; Oaks Landfill, Laytonsville, Maryland; Frederick, Maryland, Ocean County Landfill, Lakewood, New Jersey.

- Construction Project Manager for design-build services for the construction of a leachate storage and pretreatment system. Services included site layout and survey, structural design and engineering, HVAC and electrical design and engineering, and permitting. Construction services included a grit removal facility, a 1.5 million-gallon reinforced concrete (lined) storage/equalization tank; two 150,000-gallon glass-lined bolted equalization tanks, raw leachate pump station, 15,000 sq. ft. pre-engineered metal treatment building with laboratory and office facilities, metals precipitation, anaerobic and aerobic biological treatment, sludge storage and dewatering, and fully automated computer control and data acquisition system. Scranton, Pennsylvania.



Master List:

1. Senior Resident Engineer for the construction of a new \$112-million, 60-MGD water treatment plant, Town Creek Reservoir, Macon, Georgia
2. As President of EnviroStructures Contracting Company, Camden, New Jersey, he was directly involved with the construction of a \$9 million wastewater treatment facility for the Minnesota Corn Processors, Marshall, Minnesota. This was part of a \$150 million industrial expansion to an existing ethanol and fructose syrup manufacturing facility involving in excess of 20 prime contractors. The wastewater treatment facility portion involved the installation of pre-purchased wastewater process treatment equipment systems including pumps, blowers, chemical feed and storage facilities, process storage tanks and appurtenances, associated mechanical piping systems, structural steel support systems and stair towers, FRP roof systems, reinforced concrete foundation systems, heating and odor control systems. The project was performed under a fast-track design-build contract. Construction was performed through the winter months in sub-zero weather allowing the project to be successfully completed over an 11-month period.
3. Project Manager for the upgrade of an existing wastewater treatment plant, involving over 12,000 cubic yards of reinforced concrete for treatment unit tanks and structures, major site work including structure excavation and backfill, bituminous roadways, site piping, and site grading. New facilities installed included raw wastewater pumps and variable speed controls, primary clarifiers, oxidation ditch, secondary clarifiers, waste sludge and return sludge pumping facilities and controls, chlorine contact tank, chlorination and chemical feeds facilities and sludge dewatering facilities. Chalfont New Britain Sewer Authority, New Britain, Pennsylvania.
4. Project Manager for the construction of a structural steel framed, concrete and masonry building addition to house a new sludge incineration system, designed for incinerating dewatered sludge at a rate of 2,000 pound per hour (dry solids). The system consisted of a multiple hearth furnace, venturi scrubber, aftercooler, wet electrostatic precipitator, fans and blowers, ducts, dampers and stacks, ash handling system, pumps and piping, instrumentation and controls, and a regenerative thermal oxidizer. In addition to the incineration facility, the project also included sludge storage and mixing systems, sludge dewatering equipment, live bottom dry sludge cake receiving facility, sludge cake feed pump systems, polymer batching and feeding systems, and odor control equipment. The completed project received an engineering excellence award from the Commonwealth of Pennsylvania. Hatfield Township Municipal Authority, Hatfield, Pennsylvania.
5. .
6. Project Manager for the construction of several leachate pretreatment systems at various locations. Construction/construction management services included the installation of pre-purchased process treatment equipment. Facilities installed and constructed included pre-engineered metal treatment building with office facilities, aerobic biological treatment, primary and clarification, sludge storage and dewatering, chemical feed systems, extensive miscellaneous



metal steel platforms and walkways, and HVAC, plumbing and electrical systems. Clinton County Solid Waste Authority, McElhattan, Pennsylvania; Oaks Landfill, Laytonsville, Maryland; Ocean County Landfill, Lakewood, New Jersey.

7. Project Manager for the construction of a raw leachate collection and pumping system, conveyance forcemain, storage facilities, and truck fill loading station. The project featured 5,400 l.f. parallel 16-inch and 6-inch forcemain, two 750,000 gallon glass lined storage tanks, reinforced concrete tank foundation, precast prestressed concrete pile foundation support system, leachate transfer pump station and truck loading facility, and electrical, instrumentation, and control systems. Brown Station Road Landfill, Upper Marlboro, Maryland.
8. Project Manager for the upgrade of existing clarification and sludge pumping facilities. Facilities were part of the American Cyanamid Advanced Wastewater Treatment System. Project included the construction of new waste and return sludge pumping and control systems, six new 110-foot-diameter rapid draw off clarifiers and chlorine storage and feed facilities. Extensive modifications to and construction of new HVAC, plumbing, electrical, and instrumentation systems were part of the scope of work. Specialty remedial work involving asbestos encapsulation were also required. All aspects of project were phased so as to maintain the existing treatment plant in operation at all times. Somerset Raritan Sewer Authority, Bridgewater, New Jersey.
9. Project Manager for design-build services for the construction of a leachate storage and pretreatment system. Services included site layout and survey, structural design and engineering, HVAC and electrical design and engineering, and permitting. Construction services included grit removal facility, 1.5 million-gallon reinforced concrete (lined) storage/equalization tank, two 150,000-gallon glass-lined bolted equalization tanks, raw leachate pump station, 15,000 sq. ft. pre-engineered metal treatment building with laboratory and office facility, metals precipitation, anaerobic and aerobic biological treatment, sludge storage and dewatering, and fully automated computer control and data acquisition system. Empire Sanitary Landfill, Scranton, Pennsylvania.
10. Project Manager for general contracting services for a construction of treatment plant upgrades to increase the operating capacity of an existing water plant to 4 MGD. Construction services included the supply, installation, and interconnection of the following: raw water pumps and control system, in-line rapid mix system, chemical feed facilities, flocculation equipment, upflow tube settlers and automated sludge removal system, sludge storage and thickening facilities, carbon storage and feed silo, filter reconstruction, new masonry and steel framed administration building, new office and laboratory facilities, and fully automated computer control system.



Commissioner Training — 2009

6 – Item Six Construction Contract Administration – Presentation outline is attached

Construction Contract Administration

Creating a Team Toolbox - Tips to keeping the Plant Online While Avoiding Contract Litigation

Presented by: Robert F. Wierzbicki, P.E.

Jordan Jones & Goulding

Construction Industry Issues

Project Team Issues

Toolbox Tip No. 1:

Establishing the Procedures and Workflows

- Development of a Construction Management Plan
- Incorporation of Standard Policies & procedures
- Utilization of Seasoned Professionals
 - Scheduling
 - Cost Estimating
 - QA/QC
 - Change management
 - Claims Analysis
 - Plant Operations

Toolbox Tip No. 2:

Utilizing technology through Implementation of a Collaborative Document Tracking & Control System (DTCS)

- Document Types
- Filing Systems
- Internet Access 24-7
- DTCS Advantages

Toolbox Tip No. 3:

Utilize Technology through Development and Monitoring of a detailed Project Schedule

- **CPM Scheduling Software**
 - What is it?
- **Scheduling Requirements**
 - Cash Loading
 - Resource Loading
 - Integration with Payment Requisition Processing
- **Cash Flow Projections**



Commissioner Training — 2009

7 – Item Seven No.



Commissioner Training — 2009

1 – Item One Northern Kentucky Water District
2835 Crescent Springs Road
P.O. Box 18640
Erlanger, KY 41018



Commissioner Training — 2009

2 – Item Two Name: Workers' Compensation Overview

Sponsor: Kentucky Employers' Mutual Insurance (KEMI)

Subject Matter: An overview of the KEMI Workers' Compensation program and its components.



Commissioner Training — 2009

- 3 – Item Three This presentation offers the Board of Commissioners an overview of our workers' compensation program, including its various components, processes, and education efforts.



Commissioner Training — 2009

- 4 – Item Four One Credit Hour – Copy of Board Minutes showing Commissioners attendance will be attached after May 21, 2009 meeting.



Commissioner Training — 2009

5 – Item Five Mr. Jeff Floyd, KEMI Loss Education Field Representative
Kentucky Employers' Mutual Insurance (KEMI)

Bio of the presenter is attached.

Jeff Floyd

Jeff Floyd has twenty years of experience working together with business owners, safety professionals, and supervisors developing, implementing, and maintaining loss prevention plans and employee training programs. During that time Jeff has worked within a broad range of industries throughout the state of Kentucky and encountered a varied assortment of scenarios and unique situations that relate to safety and workers' compensation.

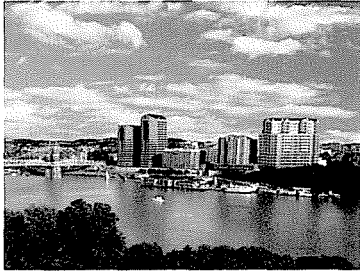
Jeff received a Bachelor of Business Administration from Eastern Kentucky University and is currently working toward a Masters degree in Loss Prevention and Safety (also from ECU). During his career, Jeff has attended several professional development seminars and classes from the OSHA Training Institute, KYOSH Division of Education and Training, American Society of Safety Engineers, and the National Safety Council. In recent months, Jeff became an OSHA Construction Industry Outreach Trainer and is authorized to conduct the 10- and 30-hour construction safety course.



Commissioner Training — 2009

6 – Item Six Workers' Compensation Overview – PowerPoint handouts attached

Northern Kentucky Water District



Workers' Compensation Overview

Kentucky Employers' Mutual Insurance



- Robert Palmer- Field Education
- Eli Roberts- Loss Education
- April Briscoe-Claims Examiner

KEMI

- Largest writer of Workers' Compensation in Kentucky
- Focus on financial stability and consistency
- "Excellent" rated by A. M. Best for 8 consecutive years
- 2007 "Top 50" carrier-National Underwriter
- KEMI.com and work place technology



Workers' Compensation Overview

- Work related injury or occupational illness
- Provides coverage for medical expenses
- Lost wages (indemnity) for a injured employee off work 8 or more consecutive days (2/3 of average weekly wage)
- Premium is based on operations & payroll
- Premium is impacted by loss history, experience modification & safety program

KEMI Loss Education

- Partner with our policyholders to help strengthen and maintain an effective safety program
- Help reduce the frequency and cost of claims
- Preventing claims and managing claims are the 2 ways to reduce cost
- On-site surveys, safety meetings & training, safety material, KEMI.com, customer service

Components of a Safety Program

- Formal safety program
- Accountability
- Return to work program
- Accident investigation
- Work site safety
- Claims Management

Formal Safety Program

- Establish company & department procedures and goals
- Use standardized procedures & forms
- Documentation
- Conduct (and document) safety meetings and safety training
- Equipment & vehicle training, operation and maintenance
- Safety committee

Accountability

- Applies to all employees
- Enforcement of safety procedures including personal protective equipment
- Be proactive regarding safety issues
- Hiring practices & employee relationships
- Safety incentives

Return to Work Program

- Light/restricted duty
- Reduce lost time claims
- Faster recovery time for injured worker
- Reduce the impact on productivity
- Improves communication between injured worker and employer
- Reduced insurance cost
- Reduces the financial impact for injured workers

Accident Investigation

- Respond quickly to investigate an accident
- Accident investigation form & report
- Determine root cause of accident
- Communicate the findings of investigation
- Implement corrective action (if necessary)
- Investigate & communicate "near misses"
- Utilize investigation to help prevent future claims

Work Site Safety

- Accountability
- Supervision
- Work site evaluation
- Personal protective equipment
- Proper training and use of equipment
- Traffic control
- Transportation to and from work sites

Claims Management

- Timely reporting of claims
- Central contact person for claims
- Communication with injured workers
- Report minor injuries
- Central medical provider
- Relationship with the medical provider

Benefits of a Safety Program

- Safe workplace
- Safe employees
- Fewer accidents
- Increased productivity
- Lower insurance cost
- Lower operating expenses

Experience Modification

- Modifies the manual rating (1.0) to reflect the policyholder's loss history
- An experience modification is calculated based on an employers payroll, and their actual losses versus the expected losses for their operations
- Incentive for employers to have an effective safety program

Northern Kentucky Water District

- Experience modification .76 for the 7/1/08-7/1/09 policy period
- Class codes: Based on your operations
Class Code 7520: Waterworks Operations and Drivers
Class Code 8810: Clerical Employees
- Effective & comprehensive safety program
- Partnership with KEMI

How it affects your Cost

- Decrease in accidents and injuries
- Decreased insurance cost
- Increased productivity
- Decreased operating expenses



Commissioner Training — 2009

7 – Item Seven No.



Commissioner Training — 2009

1 – Item One Northern Kentucky Water District
2835 Crescent Springs Road
P.O. Box 18640
Erlanger, KY 41018



Commissioner Training — 2009

2 – Item Two Name: Radio Frequency Meter Reading – “Now and Future”

Sponsor: Badger Meter, Inc.

Subject Matter: An update of the NKWD automated meter reading project and an overview of related issues.



Commissioner Training — 2009

- 3 – Item Three This presentation provides the Board of Commissioners with an update of the NKWD automated meter reading installation project and what to expect in the near future including: managing meter data, improved customer service, and projected changes in technology.



Commissioner Training — 2009

- 4 – Item Four One Credit Hour – Copy of Board Minutes showing Commissioners attendance will be attached after June 18, 2009 meeting.



Commissioner Training — 2009

5 – Item Five Ms. Sara Chasteen
 Project Manager for Utility Metering
 Badger Meter, Inc.

Bio of the presenter is attached.

	Sara Jane Chasteen – NKWD Project Manager
Summary of qualifications	<p>Ms. Chasteen has been a Project Manager for Utility Metering where her duties are associated to planning, designing and implementing fixed network automatic meter reading/advanced metering infrastructure (AMR/AMI) technologies for Badger Meter, Inc. She has been employed by Badger Meter, Inc. since September of 2007. Ms. Chasteen has over 12 years of water industry experience in addition to her manufacturing background, sales experience, and technical expertise. Ms. Chasteen was hired at BMI to augment project management of AMR/AMI implementation from presale to full project implementation by utilizing her skills as a driven, technically trained, and customer focused employee. Her technical skills, project management and field experience helps to put Badger in a position to be successful in the area of providing AMR/AMI solutions to our customer.</p>
Education	2001 Bachelor of Science – University of Wisconsin–Milwaukee Geophysics and Geology
Professional experience	<p>2007 – Present Project Manager – Badger Meter, Inc. 2005 – 2007 Regional Sales Engineering Manager – Polar Ware Company 2002 – 2005 Field Service Representative (Auditor) – NSF International 2000 – 2002 Material/Operation Manager – Tomahawk Manufacturing 1998 – 2000 Chemical Technician – Borden Chemical Company 1991 – 1998 Mechanical Technician – Ametek/Plymouth Products</p> <p>Professional Membership - American Society for Quality.</p>
Project Experience	<p>Ms. Chasteen has 12 years of water industry experience as well as the addition of her Manufacturing and Engineering background. Prior to working for Badger Meter, Ms. Chasteen has directed projects from sales through design and implementation. She has also created quality control programs including SOP's for processes and training. Her duties have involved trouble shooting on manufacturing lines, working with vendors and heading regulatory agency projects in the water industry.</p>
Additional Information	<p>Ms. Chasteen has designed, installed and managed the installation of network systems since she has been with Badger.</p>



Commissioner Training — 2009

6 – Item Six Radio Frequency Meter Reading – “Now and Future” – Presentation outline is attached

June Board of Commissioners Meeting Educational Program

Radio Frequency Meter Reading “Now and Future”

Sara Chasteen, Badger Meter, Inc.

Speaking Points:

Northern Kentucky Water District Project

- Project Update
 - Are we on schedule?
 - Challenges along the way
 - Effectiveness
 - Completion Schedule
- Managing Meter Data
 - Potential Leaks
 - Tamper Data
 - 24 Hour Information
- Improved Customer Service
 - Trending
 - Conservation
- Technology Changes
 - Current Technology / Districts Flexibility
 - Future Technology & Application
 - Hybrid Systems



Commissioner Training — 2009

7 – Item Seven No.



Commissioner Training — 2009

1 – Item One Northern Kentucky Water District
2835 Crescent Springs Road
P.O. Box 18640
Erlanger, KY 41018



Commissioner Training — 2009

2 – Item Two Name: The Bond Rating Process

Sponsor: Ross, Sinclaire & Associates, LLC (RSA)

Subject Matter: An overview of the bond rating process.



Commissioner Training — 2009

- 3 – Item Three This presentation provides an overview to the Board of Commissioners of the bond rating process including: rating definitions, agencies, criteria, impact to pricing, and areas of concern and focus.



Commissioner Training — 2009

- 4 – Item Four One Credit Hour – Copy of Board Minutes showing Commissioners attendance will be attached after July 16, 2009 meeting.



Commissioner Training — 2009

5 – Item Five Mr. Ryan Barrow, VP of Public Finance,
Kentucky Local Government Public Finance Division
Ross, Sinclaire & Associates, LLC (RSA)

Bio of the presenter is attached.

ROSS, SINCLAIRE & ASSOCIATES, LLC

Public Finance & Investments

RYAN P. BARROW

NASD:

- ◆ General Securities Representative (Series 7)
- ◆ Uniform Securities Agent (Series 63)

PROFESSIONAL EXPERIENCE:

Ross, Sinclair & Associates, LLC

December 2004 - Present

- Vice President of Public Finance in the Kentucky Local Government Public Finance Division. With responsibility to ensure optimal financing options are met, analyze data and trends, and examination of current and projected utility rates for rate analysis production reports. Proficient in financial structuring and spreadsheet creation in order to allow for specific analysis and greater flexibility in reaching optimal financing goals.

Engagements include the following:

- Municipal Bond Financial Advisor
- Comprehensive Financial Planning Services
- Evaluate Financing Options
- Evaluate Credit Enhancements
- Investment of Bonds Proceeds

Black & Veatch Corporation, Enterprise Consulting Division

June 2001 – December 2004

- Senior Financial Management Analyst. Report to the Director of Water and Wastewater Services with the responsibility for conducting a broad range of financial and management services for international and domestic clients.

Engagements include the following:

- Comprehensive Financial Planning Services
- Financial and Operational Data Analysis and Projections
- Preparation of Computer Models for Financial Planning, Rate and Feasibility Studies
- Field Inspections
- Storm Water Utility Implementation
- Consolidation of Performance Metrics
- Feasibility Studies
- Workshop Facilitation
- Internal Black and Veatch Quality Control/Risk Management Resource (QC/RM)

EDUCATION:

University of Kentucky

- ◆ B.S. in Mechanical Engineering, *Cum Laude*

University of Kentucky

- ◆ M.B.A., *Cum Laude*

PROFESSIONAL REGISTRATION:

- ◆ Engineer-in-Training, Kentucky



Commissioner Training — 2009

6 – Item Six The Bond Rating Process – Presentation Outline is attached

THE BOND RATING PROCESS OUTLINE

Ryan Barrow

Ross, Sinclair & Associates

What is a Bond Rating

A bond rating is an interpretation by a "rating agency" as to the credit risk evaluation of an issuer across its peer group.

Rating Agencies

There are three major rating agencies for municipal bonds: Moody's Investors Service, Standard & Poor's, and Fitch Ratings. Of the three rating agencies, Standard & Poor's and Moody's rate over 80% of all municipal and corporate bonds.

Rating Criteria

In assigning a rating for general obligation bonds the rating agency assesses the following factors:

- Financial Condition
- Economy
- Demographics
- Debt Structure
- Management Practices and Administration

Rating agencies use mathematical ratios to compare an issuer to others; however, a rating is not a scientific evaluation and subjective evaluation appears to also play a role in the final rating assigned.

Ratings

The following table shows the comparable investment grade ratings of the three major rating agencies:

	Moody's	Standard & Poor's	Fitch
Best Quality	Aaa	AAA	AAA
High Quality	Aa1 Aa2 Aa3	AA+ AA AA-	AA+ AA AA-
Upper Medium Grade	A1 A2 A3	A+ A A-	A+ A A-
Medium Grade	Baa1 Baa2 Baa3	BBB+ BBB BBB-	BBB+ BBB BBB-

Ratings Impact to Pricing

While many factors go into the investment decision making process, the bond rating is often the single most important factor affecting the interest cost on bonds.

	AA Rated Bond	A Rated Bond	Baa Rated Bond
Total Payback			
Annual Debt Service			
Interest Rate			

Rating Schedule

- Financing Plan
- Audits
- Meeting
- Follow-up Questions
- Credit Review

Rating Concerns & Areas of Focus

- Cash Management
- PSC & Rates
- Capital Plan



Commissioner Training — 2009

7 – Item Seven No.



Commissioner Training — 2009

1 – Item One Northern Kentucky Water District
2835 Crescent Springs Road
P.O. Box 18640
Erlanger, KY 41018



Commissioner Training — 2009

2 – Item Two Name: Benchmarking Update

Sponsor: Northern Kentucky Water District

Subject Matter: An update of Northern Kentucky Water District benchmarks.



Commissioner Training — 2009

- 3 – Item Three This presentation will update the Board of Commissioners on the Northern Kentucky Water District's benchmarks, including the areas of finance, production, engineering, account services, and human resources.



Commissioner Training — 2009

- 4 – Item Four One Credit Hour – Copy of Board Minutes showing Commissioners attendance will be attached after August 20, 2009 meeting.



Commissioner Training — 2009

5 – Item Five Mr. Jack Bragg, VP Finance,
 Northern Kentucky Water District
 Ms. Bari Joslyn, VP Water Quality & Production,
 Northern Kentucky Water District
 Mr. Richard Harrison, VP Engineering & Distribution,
 Northern Kentucky Water District
 Mr. Mark Lofland, VP Account Services,
 Northern Kentucky Water District
 Mr. Bob Buhrlage, Human Resources Manager,
 Northern Kentucky Water District

Bios of the presenters are attached.



Jack Bragg

Finance

Jack Bragg is Vice President of Finance at the Northern Kentucky Water District. He has Bachelor Degrees in Accounting and Agricultural Economics from the University of Kentucky, and both a Master's Degree in Business Administration and a Master of Accountancy from NKU. His main responsibility is overseeing the financial, general legal and general administrative areas of the District.

Jack is active in the Northern Kentucky Chamber of Commerce and a graduate of Northern Kentucky Leadership Class 2007. He is a member of the American Water Works Association, American Institute of Certified Public Accountants, Kentucky Society of Certified Public Accountants, and the Institute of Management Accountants. He oversees the District's annual 40 million-dollar budget.

Jack has been with the Northern Kentucky Water District since 2005.



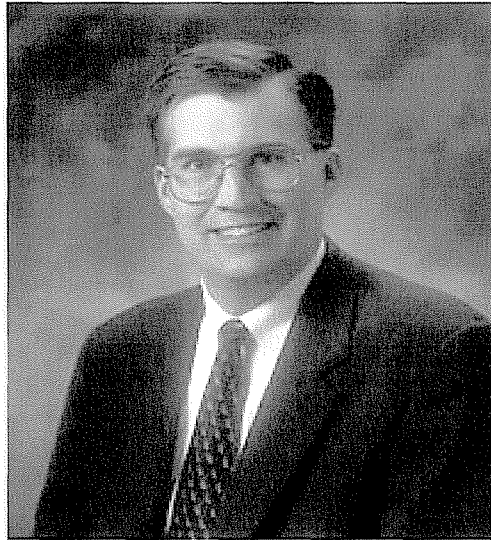
Bari Joslyn

Water Quality and Production

Bari L. Joslyn is Vice President of Water Quality and Production at the Northern Kentucky Water District. She has a Bachelor's Degree in Biology from Northern Kentucky University and a Master's Degree in Environmental Science from the University of Cincinnati. She also holds a Class IV water treatment plant operator license and a Class IV distribution system operator license. The group she manages is responsible for the pumping, treatment, quality control, and regulatory compliance of the water supplied by the Northern Kentucky Water District.

Bari is a Past Chair of the KY-TN Section of the American Water Works Association (AWWA) and served as the national representative for Kentucky and Tennessee to the AWWA from 2003 – 2006. Bari is a past winner of the George Warren Fuller Award, which is presented annually to an outstanding AWWA member in each section. She serves on the Board of Trustees for the St. Elizabeth Medical Center (SEMC) and also serves as the Chair of the SEMC Human Resources committee. She is past Chair of the Northern Kentucky Mental Health and Mental Retardation Board, and is Past Chair of the Covington-Kenton County Kiwanis Club. Bari was one of 4 women honored with the Northern Kentucky Woman of the Year in 2001.

Bari has held several positions within the Northern Kentucky Water District since her hiring in 1978.



Richard Harrison

Engineering and Distribution

Richard Harrison is Vice President of Engineering and Distribution at the Northern Kentucky Water District. He has a Bachelor's of Science Degree in Civil Engineering from the University of Kentucky and is a Licensed Professional Engineer in the State of Kentucky. The group he manages is responsible for the maintenance of the distribution system and the procurement of professional services, design and construction management for new projects for the District.

Richard is a past President and current member of the Covington Rotary Club and a member of the Northern Kentucky Society of Professional Engineers currently serving on the Chapter's Board of Directors. He is also a member of the American Water Works Association serving as the Chair of the executive committee of the Kentucky Water Utility Council. He is a graduate of Leadership Northern Kentucky 1996.

Richard has been with the Northern Kentucky Water District since 1988.



Mark Lofland

Customer Service

Mark Lofland is Vice President of Account Services and Billing at the Northern Kentucky Water District. He is responsible for the management of customer services and billing, light field services, meter reading, meter testing, meter repair. He is a graduate of Northern Kentucky University and has earned Distribution System, Water Treatment, and Meter Testing licenses from the Commonwealth of Kentucky. He is a graduate of Leadership Northern Kentucky 2008.

Mark is a member of the American Water Works Association (AWWA), has volunteered time to the Northern Kentucky Chamber of Commerce, and has been involved coaching youth sports for several years.

Mark has been with the Northern Kentucky Water District since 1982.

Bob Buhrlage
Human Resources

Bob Buhrlage is the Human Resource Manager at the Northern Kentucky Water District. He is responsible for all Human Resource activities, Safety and IT. He has a Bachelor's Degree and a M.A.I.R. from the University of Cincinnati.

Bob is a member of the American Water Works Association and serves on the Associations' Workforce Strategies Committee. Bob is also a member of the Society for Human Resource Management (SHRM) and the Kentucky Public Human Resource Association (KPHRA). Bob has been a past Explorer Advisor, Big Brother and PTA Treasurer.

Bob has been with the Northern Kentucky Water District since 1998.



Commissioner Training — 2009

6 – Item Six Benchmark Update – PowerPoint handouts attached

Benchmark Review

Definition of Benchmark

The process of measuring and improving performance by continuously identifying, evaluating, and adopting outstanding practices and processes found inside and outside the water industry.

History of NKWD Efforts

- Pre & Post Merger
- HDR Engineering Study in 1998
- Performance Reviews
- Internal Operational/Budgetary/Planning Decisions
- Asset Mgt. Program
- Bond Rating
- KDOW/PSC/EPA/AWWA
- Board Presentation November 17, 2005
- Board Presentation July 25, 2007
- Board Presentation August 21, 2008

AWWA BENCHMARKS

- Organizational Best Practices Index
- Employee Health and Safety Severity Rate
- Training Hours per Employee
- Customer Accounts per Employee
- MSD Water Delivered per Employee
- Customer Service Complaints/Technical Quality Complaints
- Disruptions of Water Service
- Customer Service Cost per Account

- Residential Cost of Water
- Billing Accuracy
- Debt Ratio
- System Renewal/Replacement Rate
- Return on Assets
- Drinking Water Compliance Rate
- Distribution System Water Loss
- Water Distribution System Integrity
- Operations and Maintenance Cost Ratios
- Planned Maintenance

Benchmarking Performance Indicators for Water and Wastewater Utilities: Survey Data and Analysis Report, 2005

Other BENCHMARKS Sources

- Human Resources Society
- Financial Institutional Firms
- AWWA Research Foundation
- AMWA
- Electric Utilities

Northern Kentucky
WaterDistrict

Benchmark Performance Indicators

FINANCIAL

- Debt Ratio
- O&M per Customer Accounts
- Bad Debt
- Rate Comparison

WATER QUALITY & PRODUCTION

- Planned Maintenance
- Cost of Treatment per Million Gallons

DISTRIBUTION

- Distribution Water Loss
- Water Distribution System Integrity

CUSTOMER SERVICE

- Customer Complaints
- Billing Accuracy
- Customer Service Cost per Account

HUMAN RESOURCES

- Employee Health and Safety Severity Rate
- Salaries of % of O & M
- Revenue per FTE
- Turnover Rate
- Salaries
- Customer Accounts per Employee

Northern Kentucky
WaterDistrict

Financial

Northern Kentucky
WaterDistrict

Debt Ratio

total liabilities
total asset
(Goal is lower %)

	2005	2006	2007	2008
NKWD	64.7%	61.5%	62.61%	TBD%
South (AWWA)	40%	34.2%	34.2%	TBD%
Population Served (AWWA)	40%	27.9%	32.2%	TBD%
Moody's	43%			TBD%
NKWD with Un-booked assets			43.82%	TBD%

Northern Kentucky
WaterDistrict

O&M per Customer Account

Total O&M
Number Customers
(Goal is lower \$)

	2005	2006	2007	2008
NKWD	\$253	\$260	\$297	\$TBD
South (AWWA)	\$220	\$243	\$201	\$TBD
Population Served (AWWA)	\$290	\$259	\$259	\$TBD

Northern Kentucky
Water District

Bad Debt %

total sales written off
total sales
(Goal is lower %)

	2005	2006	2007	2008
NKWD	1.5%	1.5%	1.25%	TBD%
Sanitation Dist No. 1	1.27%	1.3%	1.32%	TBD%
Kentucky American Water	1.1%	1.03%	0.79%	TBD%
Owen Electric Cooperative	0.5%	.20%	0.11%	TBD%
Boone County Water	0.3%	.32%	0.29%	TBD%

Northern Kentucky
Water District

RATES

Based on Average Monthly Usage of 7,500 Gallons
(Goal is lower \$)

	2005	2006	2007	2008
NKWD	\$31.49	\$33.53	\$39.51	\$TBD
South (AWWA)	\$20.70	\$22.67	\$24.34	\$TBD
Population Served (AWWA)	\$20.50	\$23.58	\$23.55	\$TBD

Northern Kentucky
Water District

Water Quality & Production

Planned Maintenance

Hours of planned maintenance
(hours of planned + hours of corrective maintenance)
(Goal is higher %)

	2005	2006	2007	2008
NKWD	52%	66%	72.9%	TBD%
South (AWWA)	48%	67.9%	55.3%	TBD%
Population Served (AWWA)	53%	55%	64.1%	TBD%



17

Cost of Treatment per Million Gallons

total O&M costs directly attributable to water treatment
total volume (million gallons) distributed
(Goal is lower \$)

	2005	2006	2007	2008
NKWD	\$265	\$308	\$333	\$TBD
South (AWWA)	\$518	\$564	\$496	\$TBD
Population Served (AWWA)	\$369	\$471	\$370	\$TBD

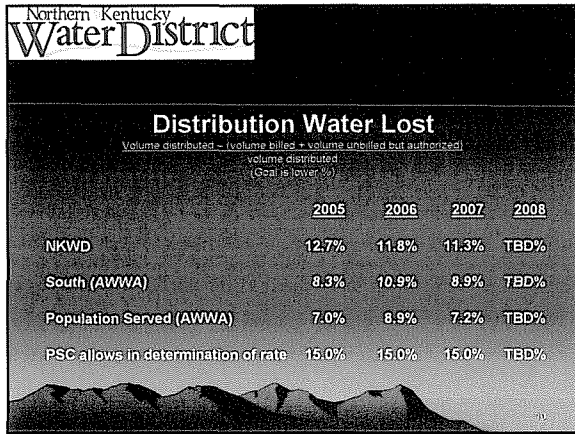


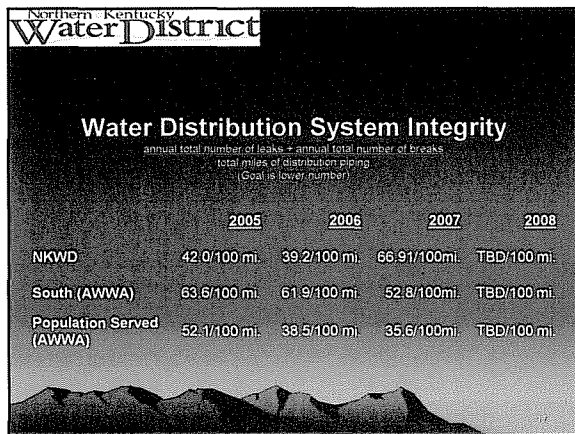
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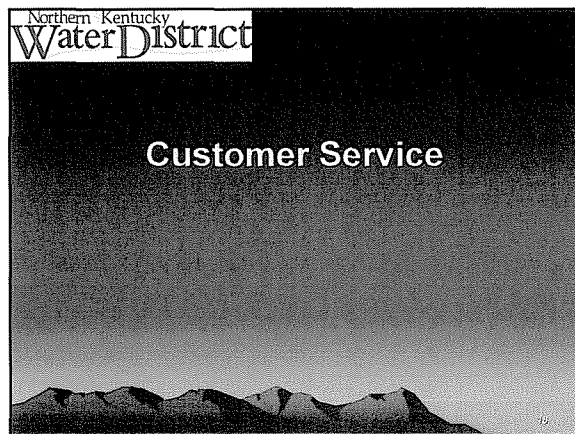
Engineering & Distribution

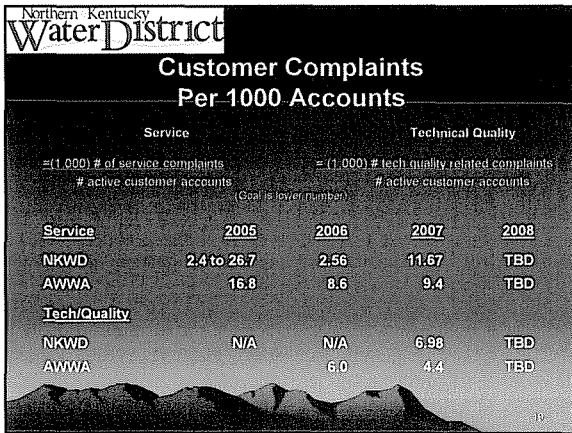


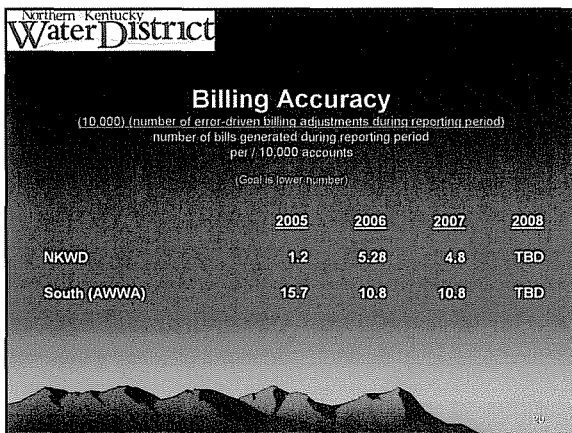
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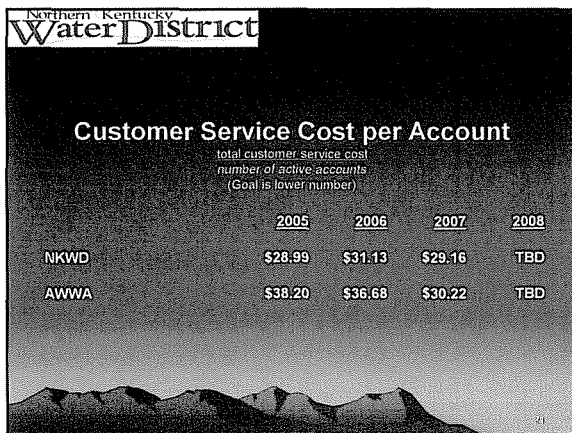













Northern Kentucky
Water District

Call Center Staffing

total calls per day
64 (per AWWARF)


	2005	2006	2007	2008
NKWD	5.2	7.5	N/A	TBD
AWWARF Off-Peak	6.7	6.4		TBD
AWWARF Peak	9.1	7.6		TBD



Northern Kentucky
Water District


Average Hold Time

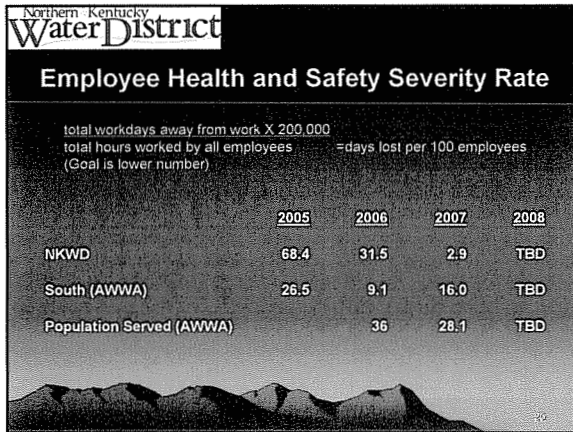
	2005	2006	2007	2008
NKWD	3.78 min.	1.21 min.	N/A	TBD
AWWA Research Foundation	20 to 45 sec.			TBD

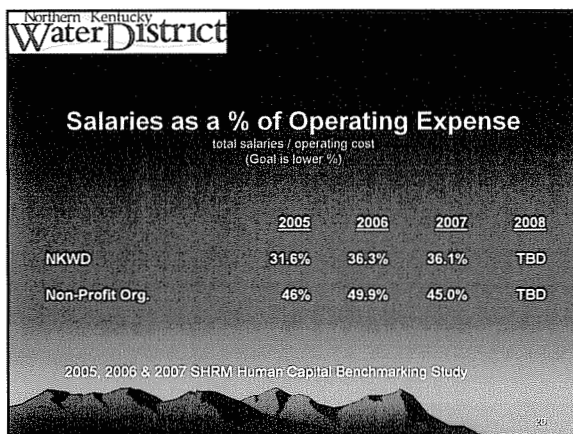


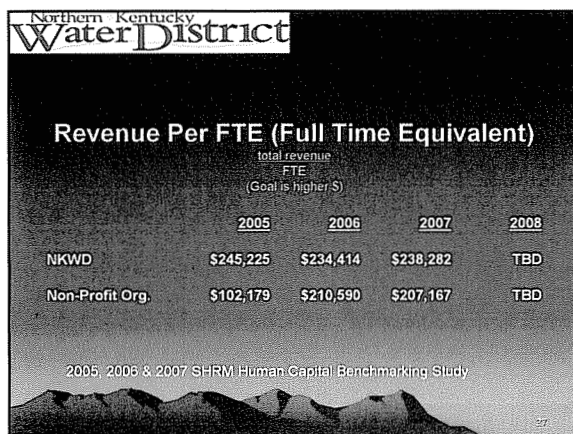
Northern Kentucky
Water District

Human Resources









Salaries

Wage Survey	2005	2006	2007	2008
Participated In	7	7	9	TBD
Obtained	4	0	3	TBD

From Data Survey

• Benchmarked 25 positions out of 71 positions

Turn Over Rate

number of separations
average number of employee
(Goal is lower %)

	2005	2006	2007	2008
NKWD	5.9%	6.5%	6.4%	TBD
Average Non-Profit	17.9%	24.0%	19.0%	TBD

2005, 2006 & 2007 SHRM Human Capital Benchmarking Study

Customer Accounts per Employee

number of accounts
number of FTE's
(Goal is higher number)

	2005	2006	2007	2008
NKWD	503	516	511	TBD
South (AWWA)	476	517	555	TBD
Population Served (AWWA)	498	491	568	TBD



Commissioner Training — 2009

7 – Item Seven No.



Commissioner Training — 2009

1 – Item One Northern Kentucky Water District
2835 Crescent Springs Road
P.O. Box 18640
Erlanger, KY 41018



Commissioner Training — 2009

2 – Item Two Name: UV Advanced Oxidation

Sponsor: CH2MHill

Subject Matter: An overview of the value of advanced oxidation for the Northern Kentucky Water District.



Commissioner Training — 2009

- 3 – Item Three This presentation will outline to the Board of Commissioners the applications, issues, considerations, and value of UV advanced oxidation for the Northern Kentucky Water District.



Commissioner Training — 2009

- 4 – Item Four One Credit Hour – Copy of Board Minutes showing Commissioners attendance will be attached after September 17, 2009 meeting.



Commissioner Training — 2009

5 – Item Five Mr. Nick Winnike, P.E., Project Manager,
CH2M Hill

Bio of the presenter is attached.

Nicholas E. Winnike

Nick Winnike is a registered Professional Engineer in the state of Kentucky with 30 years of experience as a consulting engineer. He earned an M.S. in Environmental Engineering from the University of California, Davis, and a B.S. in Civil Engineering from the University of Notre Dame. Mr. Winnike specializes in water, wastewater and residuals treatment and conveyance. He serves as a project manager in the Cincinnati office of CH2M HILL. He is a member of American Water Works Association, Water Environment Federation, and the American Society of Civil Engineers and has presented technical papers at national, state and local meetings for these organizations.



Commissioner Training — 2009

6 – Item Six UV Advanced Oxidation – PowerPoint handouts attached

UV Advanced Oxidation – Applications, Issues, and Considerations for the NKWD

Northern Kentucky Water District

Thursday, September 17th, 2009

Nick Winnike, P.E., CH2M HILL

UV AOP Is An Important New Tool in the Technology Toolbox for Water Treatment

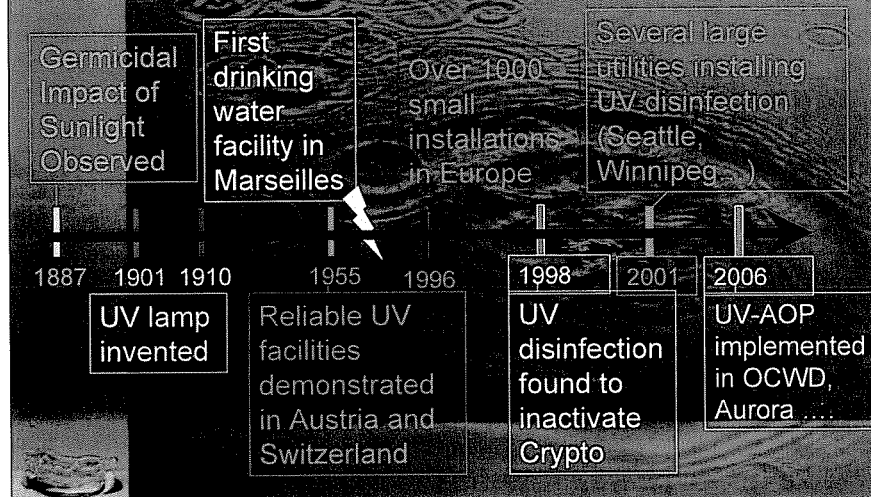


Presentation Outline

- Use of UV for Drinking Water
- Introduction to UV Advanced Oxidation
- Research Findings
- Case Study: Prairie Waters Project
 - Treatability Testing
 - UV-AOP + GAC Adsorption
- Other Case Studies
- Open Discussion
- Questions and Answers

Use of UV for Drinking Water

The Evolution of UV Disinfection



The UVDGM Was Published in November 2006



ULTRAVIOLET DISINFECTION GUIDANCE MANUAL
FOR THE FINAL LONG TERM 2 ENHANCED
SURFACE WATER TREATMENT RULE

Office of Water (505)
EPA 816-R-06-001
November 2006

- Many years of effort
- Scrutiny from multiple stakeholders and reviewers
- Disparate interests

<http://www.epa.gov/safewater/disinfection/lt2/compliance.html>

UV Absorbance/Transmittance Is The Key Parameter

- UVA/UVT is a water quality criterion that varies from water to water
- Absorbance: quartz sleeve and organic matter
- UV photons with sufficient energy must be absorbed by target organism for inactivation to occur
- Lower UVT = more lamps required

High UV254 Absorbance

0.10 A = 80% T



High UV Transmittance

0.02 A = 95% T

UV Dose Tables

- UV doses required for inactivation credit
 - 0.5 to 4.0 log credit for *Cryptosporidium* and *Giardia*
 - 0.5 to 4.0 log credit for viruses
- Bench scale, low pressure UV lamp inactivation data
- Account for uncertainty in UV dose-response relationships of pathogens
- Premised on post-filter application and unfiltered systems
- Do not address other significant sources of uncertainty in full-scale UV disinfection applications:
 - hydraulic effects of installation
 - UV reactor equipment (e.g., UV intensity sensors)
 - monitoring approach

Required UV Doses (mJ/cm²) for Inactivation Credit

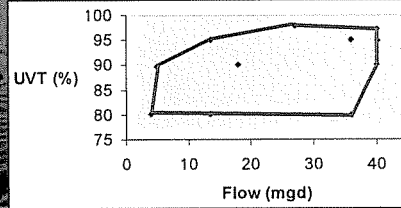
Micro	1 log	2 log	3 log	4 log
<i>Crypto</i>	2.5	5.8	12	22
<i>Giardia</i>	2.1	5.2	11	22
Virus	58	100	143	186

Validation Factor must be applied to these UV doses!

Validation Tests Verify Performance of UV Equipment

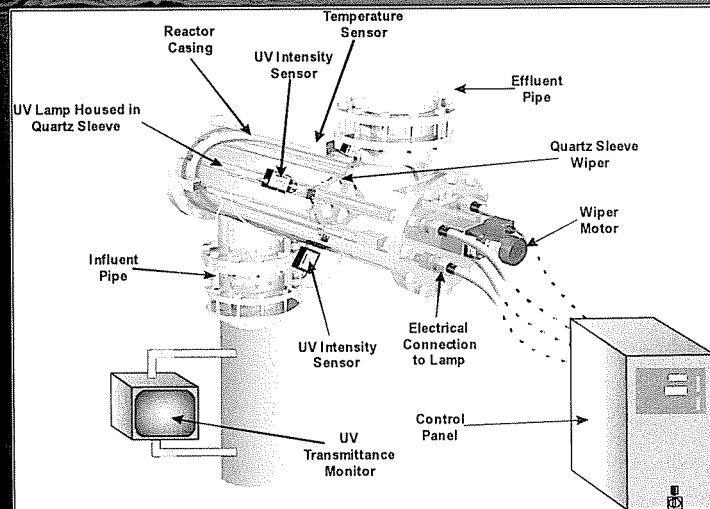
- Validation links UV dose delivery to the monitored parameters

- Flow rate
- UV intensity
- UVT



- LT2ESWTR requires full-scale reactor testing with a challenge microorganism
 - Recommended method to verify disinfection performance
 - State may approve alternative methods that were not well developed when guidance was issued
 - Numerical modeling
 - Microspheres as surrogates

A "Typical" UV System



How Do Disinfectants Compare?

Disinfectant	Residual	Virus	Giardia	Cryptosporidium	Taste and Odor	Oxidation
Chlorine	✓✓	✓✓	✓			✓
Chloramine	✓✓	✓				
Ozone		✓✓	✓✓	✓	✓✓	✓✓
Chlorine Dioxide	✓	✓	✓	✓	✓	✓
UV		✓	✓✓	✓✓		
UV-Peroxide		✓✓	✓✓	✓✓	✓✓	✓✓



Commissioner Training — 2009

7 – Item Seven No.



Commissioner Training — 2009

1 – Item One Northern Kentucky Water District
2835 Crescent Springs Road
P.O. Box 18640
Erlanger, KY 41018



Commissioner Training — 2009

2 – Item Two Name: Proposed Budget - 2010

Sponsor: Northern Kentucky Water District

Subject Matter: A presentation of the Northern Kentucky Water District's proposed budget for 2010.



Commissioner Training — 2009

- 3 – Item Three This presentation will outline to the Board of Commissioners the general funding sources, general budget process, and 2010 budget request for: revenue, debt service, operations and maintenance, operating capital, and five-year capital projects.



Commissioner Training — 2009

- 4 – Item Four One Credit Hour – Copy of Board Minutes showing Commissioners attendance will be attached after October 15, 2009 meeting.



Commissioner Training — 2009

5 – Item Five Mr. Jack Bragg, VP Finance,
 Northern Kentucky Water District

Bio of the presenter is attached.



Jack Bragg

Finance

Jack Bragg is Vice President of Finance at the Northern Kentucky Water District. He has Bachelor Degrees in Accounting and Agricultural Economics from the University of Kentucky, and both a Master's Degree in Business Administration and a Master of Accountancy from NKU. His main responsibility is overseeing the financial, general legal and general administrative areas of the District.


Jack is active in the Northern Kentucky Chamber of Commerce and a graduate of Northern Kentucky Leadership Class 2007. He is a member of the American Water Works Association, American Institute of Certified Public Accountants, Kentucky Society of Certified Public Accountants, and the Institute of Management Accountants. He oversees the District's annual 40 million-dollar budget.

Jack has been with the Northern Kentucky Water District since 2005.

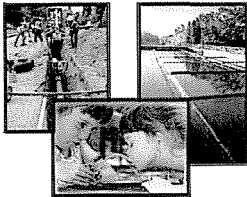


Commissioner Training — 2009

6 – Item Six Proposed Budget - 2010 – PowerPoint handouts attached




PROPOSED BUDGET



Operations & Maintenance 2010
Operating Capital Budget 2010
Capital Projects 2010-2014

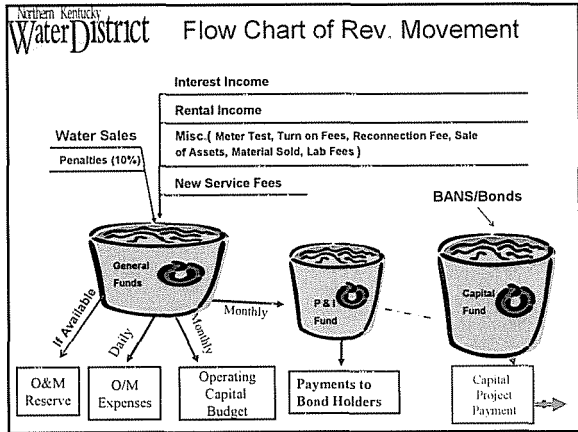
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Presentation


- Review the General Funding Sources
- Review General Budget Process
- Review 2010 Budget Request
 - Revenue
 - Debt Service
 - O&M
 - Operating Capital
 - Five Year Capital Projects
- Budget Approval

2




Northern Kentucky
Water District

Reserve Accounts




DSR

\$X



B/F Reserve

\$X




O&M

\$X

4


Northern Kentucky
Water District

Long Term Fund Sources – Currently Open




Bond 2001

\$X




Bond 2003

\$X




Bond 2004

\$X




Bond 2006

\$X



BAN 2007

\$X



Bond 2008

\$X

5

Northern Kentucky
Water District

Budget Process

- Detailed Budget Work Sheets given to each VP in September for O&M, Operating Capital, and Five Year Capital Projects.
- Departments hold individual meetings
- VP's then meet with VP of Finance
 - Provide support documents for requested numbers.
- VP review with CEO.
- IF needed, VP of Finance meets again with VP's to address remaining budget issues
- Final Budget recommendation to Board of Commissioners.

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Budget Picture

Revenue

2008

2009

Difference

%

Total Revenue

Total Debt Payment

Total O&M Expenses

Transfer to OCB

7

Budget Picture

Revenue Projections 2010

INCOME	Actual 2007	Estimated 2008	Budget 2009	Budget 2009	Difference
Water Sales					
Transfer from BCVD/PWD Settlement Fund					
Partnership Disbursements					
Interest Income					
Rents from Water Property					
Other Water Revenue					
Misc. Non-Operating Income					
TOTAL					

8

Where Does the Cash Go

Disbursements

O&M

Debt

OCB

9

Budget Picture

Debt Payments

	2008	2009	Difference	%
Total Revenue				
Total Debt Payment				
Total O&M Expenses				
Transfer to OCB				

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Debt Service Calculation

Debt Service Ratio Calculation						
	Example	Actual 12/31/2007	Actual 6/30/2007	Actual 6/30/2008	Estimated 12/31/2008	Budget 12/31/2009
Total Revenue per Bond Outstanding						
Total O & M						
Net Income Before Debt Payment						
Annual Debt Payment						
Ratio (Debt / Net Income before Debt)						
Bond Requirement (Min Req. per General Bond Resolution 1.2)						

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Budget Picture

O & M Cost

	2008	2009	Difference	%
Total Revenue				
Total Debt Payment				
Total O&M Expenses				
Transfer to OCB				

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Northern Kentucky WaterDistrict

O&M Expense Increase Five Year Trend

2006	2007	2008	2009	2010
X%	X%	X%	X%	X%

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Northern Kentucky WaterDistrict

General Assumptions for O&M Budget

Revenue

- 2007 Rate Case increase implemented starting in March of 2008
- New Customer growth (800 New Customers)
- New Water Hauling Stations
- Conservative estimates

Expenses

- Purchased Power Increase
- Chemical Cost Increase
- Transportation Cost increase
- Health Insurance Increase
- Reasonable Salary and Benefit Increases
- Based on average year of mainline breaks
- Expenses based on normal operational year

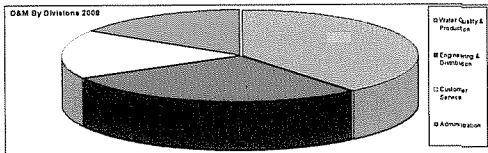
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Northern Kentucky WaterDistrict

Budget by Division

Northern Kentucky Water District Operations & Maintenance Expenses by Division						
Department	Actual 2007	Estimated 2008	Budget 2008	Proposed 2009	Variance	% Inc or % Dec
Water Quality & Production						
Engineering & Distribution						
Customer Service						
Administration						
Actual Total						

O&M By Divisions 2008



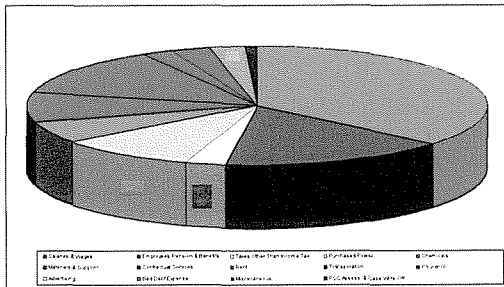
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O & M Expenses by Category

O&M Type of Activity	2008 Budgeted	2009 Budgeted	Difference
Salaries & Wages			
Employees Pension & Benefits			
Taxes Other Than Income Tax			
Purchased Power			
Chemicals			
Materials & Supplies			
Contractual Services			
Rent			
Transportation			
Insurance			
Advertising			
Bad Debt Expense			
Miscellaneous			
PSC Assess. & Case Write-Off			
Total			

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O&M Category



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Significant Factors
O&M
Increases/Decreases

Increases

- Chemicals \$ X
- Electric & Gas \$ X
- Transportation/Fuel \$ X
- Materials & Supplies \$ X
- Salaries/Benefits \$ X
 - Health Insurance X %
 - Salaries Avg. X %

Decrease

- Insurance (Worker Comp, Etc) \$ X

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NKWD Staffing History

Year	Customers	Staff
1996	X	X
1997	X	X
2001	X	X
2002	X	X
2003	X	X
2004	X	X
2005	X	X
2006	X	X
2007	X	X
2008	X	X
2009	X	X
2010	X	X

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2010 Staff Additions

<u>Engineering/Distribution</u>	<u>Proposed</u>	<u>Comments</u>
Professional Engineers	X	Construction Mgt. Adv Treatment
Fieldman	X	General Distribution Functions
<u>WQ&P</u>		
Operator in Training	X	TMTP 24Hr Operation
<u>Account Service</u>		
Team Leader	X	1/3 of Year – Start of Monthly Billing
Account Serv. Rep	X	1/3 of Year – Start of Monthly Billing
<u>Finance</u>		
Accountant	X	Project Accounting for Adv Treatment

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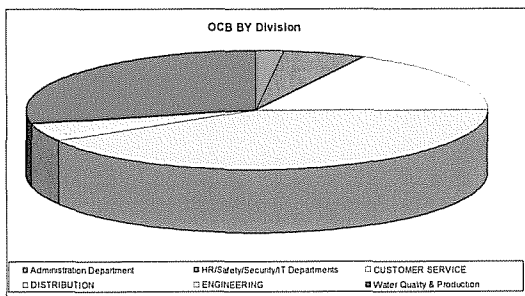
Budget Picture

Available to OCB

	2008	2009	Difference	%
Total Revenue				
Total Debt Payment				
Total O&M Expenses				
Transfer to OCB				

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Northern Kentucky Water District		
Operational Capital Budget for 2009		
Projected Available Funds for Capital Expenditures		Budget
Cash Balance 1/1/2009 - Operating Capital		12/2/2008
From Operations		
Transfer from BCOSAPWD Settlement		
Total Cash Available		
Administration Department		
Water Utility/Security Departments		
Customer Service Department		
Distribution Department		
Engineering Department		
Water Q & P Department		
Total Request		
Net Coverage not		



Prior Year Mainline Projects

Tank Painting

Replacement Meters

Replacement of Water Lines

7 Vehicles

Roof Replacement FTTP

Convert to ESRI GeoData

Trailer Mounted Generators

Computer Equipment Replacement Program

Diversion Line TMTP

Replace HMI & Distribution SCADA Panel

Valve Replacements ORPS

Sludge Polymer Equipment

HVAC Replacement at Lab

Vortex Suppressor & Soft S

1 Backhoe

Software Updates to CIS

1 Skid Steer

Five Year Capital Projects

Comparison

• 2004 to 2008	\$ X
• 2005 to 2009	\$ X
• 2006 to 2010	\$ X
• 2007 to 2011	\$ X
• 2008 to 2012	\$ X
• 2009 to 2013	\$ X
• 2010 to 2014	\$ X



2010 Five Year Capital Budget
Funding Breakdown

Unfunded Mandates/Regulations	\$ X
Infrastructure Replacement	\$ X
Security/Redundancy	\$ X
Customer Growth Needs	\$ X
Technology	\$ X

Total \$ X

2010 Five Year Capital Budget
Funding Breakdown

Unfunded Mandates/Regulations	\$ X
Infrastructure Replacement	\$ X
Security/Redundancy	\$ X
Customer Growth Needs	\$ X
Technology	\$ X

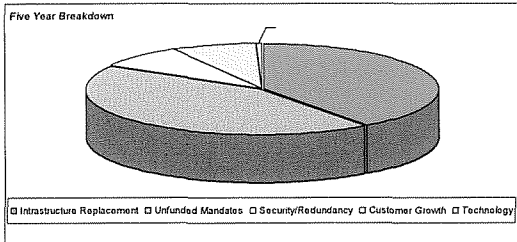
Total \$ X

Detailed 5-Yr Breakdown

- **\$ X M Unfunded Mandates**
 - \$ X M GAC at Treatment Plants
- **\$X M Infrastructure Replacement**
 - \$ X M ORPS 2 Pump Station Replacement
 - \$ X M Main Replacement
 - \$ X M Facility Replacement
- **\$X M Security/Redundancy**
 - \$ X M Water Main Redundancy
 - \$ X M Emergency Power Generators
- **\$X M Customer Growth**
 - \$ X M Water Main Upgrades and Extensions
 - \$ X M Water Storage Tank
- **\$X M Technology**
 - \$ XM Tank & Pump Improvements

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Five Year Detailed Breakdown by %



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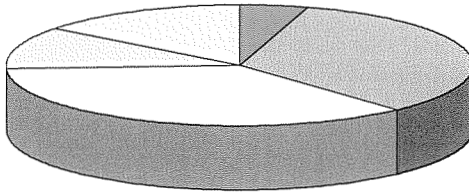
2009 To 2008 Five Year Capital Budget Comparison/Difference Explanation

2008 Five Year Capital Budget Total	\$ X
2009 Five Year Capital Budget Total	\$ X
Difference	\$ X
Summary of Key Differences:	
2009 includes additional GAC/UV	\$ X
2009 includes additional ORPS#2	\$ X
2009 includes revised AMP Additional Items	\$ X
2009 includes additional growth projects	\$ X
2009 includes reduction in AMR cost	\$ (X)
2010 includes (TBD)	\$ X

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Capital Cost by Year

Five Year Breakdown



2009 2010 2011 2012 2013

Projected Rate Impact Capital Expenditures Plan Budget 2008

	2007	2009	2011	2013	Totals
Projected Rate Increase Capital Projects					
Projected Rate Increase Estimated O&M					
Projected Depreciation Impact					
Projected Rate Increase Total					
Rate Case Filed					
Projected Implementation					
Current Avg. Consumer Bill					
Avg. Bill with Increase					

Projected Rate Impact Capital Expenditures Plan Budget 2009

	2009	2011	2013	Totals
Projected Rate Increase Capital Projects				
Projected Rate Increase Estimated O&M				
Projected Depreciation Impact (Unbooked assets could create one time 2% incr.)				
Projected Rate Increase Total				
Rate Case Filed				
Projected Implementation				
Current Avg. Consumer Bill				
Avg. Bill with Increase				

Summary

Approval of the Following:

Total Operating Budget

Debt Service Payments 2010	\$ X
O & M Operating Budget 2010	\$ X
Operating Capital Budget 2010	\$ X
Total	\$ X

Total Capital Projects Budget

Five Year Projects Budget 2010 to 2014	\$ X
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Commissioner Training — 2009

7 – Item Seven No.



Commissioner Training — 2009

1 – Item One Northern Kentucky Water District
2835 Crescent Springs Road
P.O. Box 18640
Erlanger, KY 41018



Commissioner Training — 2009

2 – Item Two Name: AquaVenture 2009

Sponsor: Northern Kentucky Water District

Subject Matter: A program update by the Education and Communication Committee.



Commissioner Training — 2009

- 3 – Item Three This presentation will update the Board of Commissioners on the objectives and activities of the Northern Kentucky Water District's Education and Communication Committee for 2009.



Commissioner Training — 2009

- 4 – Item Four One Credit Hour – Copy of Board Minutes showing Commissioners attendance will be attached after November 19, 2009 meeting.



Commissioner Training — 2009

5 – Item Five Ms. Jill Grever Cahill, Independent Consultant,
Northern Kentucky Water District

Bio of the presenter is attached.



JILL GREVER CAHILL

Jill G. Cahill is a strategic communications specialist based in the Greater Cincinnati area. Her specialties include media relations and crisis communications. She offers consulting services on a one-time or ongoing basis. She works with a limited number of clients in order to offer detailed and dedicated customer service.

Mrs. Cahill gained her media expertise during 13 years in television news as an Emmy award winning Producer and Executive Producer. She produced several live broadcasts from daily news to news specials on Tall Stacks, The Breeders Cup, the Kentucky Derby and NASCAR racing, just to name a few.

As Executive Producer, she controlled the daily content of the newscasts and was the coordinator of investigative news stories and the newsgathering process. This experience gives her deep insight into how stories are selected and how they should be “pitched” to media outlets.

Mrs. Cahill has worked for many years in the Public Relations field. She worked for several years for the Dan Pinger Public Relations Agency in the Transportation and Infrastructure group. She now works as a freelance specialist, allowing her a more flexible schedule to accommodate her young family. Former clients include Comair, Airborne Express, Biggs, the City of Cincinnati, Metropolitan Sewer District, Duke Energy and the Northern Kentucky Water District, where she continues project work today.

Jill Cahill received a bachelor's degree in Communications from Miami University in Oxford, Ohio. She is an active volunteer in the Northern Kentucky community. She is married and has two daughters.



Commissioner Training — 2009

6 – Item Six AquaVenture 2009 – PowerPoint handouts attached

Board of Commissioners Meeting

AquaVenture 2009

Presented by the Education
and Communication Committee
November 19, 2009

Northern Kentucky
Water District

Education Updates

- May 15, 2008: AquaVenture Open House
- November 15, 2007: Board Education
- November 20, 2008: Board Education

Team Members

Melissa Bielo
Sherril Cook
Debbie Kircher
Colleen Medert
Lori Simpson
Jill Cahill- Consultant

Northern Kentucky
Water District

Strategic Plan Goals

Education and Communication: Represents education and communication enabling the District to build goodwill, strong customer support and interaction with the entire community, legislative bodies and regulatory agencies.

Customer Service: Represents the establishment of the most effective options to meet the expectations and needs of our customers.

Northern Kentucky
Water District

Three Phase Plan

- Phase One: **COMPLETE**
Branding, Active Community
Involvement, Plan
Development

- Phase Two: **STATUS TBD**
Curriculum development and
relationship building

- Phase Three: **STATUS TBD**

Northern Kentucky
Water District

Phase One Success

- Education Partners: Teacher Focus Group
- Event Participation
- Proactive Information Material Development
- Media Relations
- Community Outreach
- Green Efforts

Northern Kentucky
Water District

Phase One Success

Partnering with KY Educators

- Teacher Focus Group
- Test Curriculum in Classrooms

Northern Kentucky
Water District

Phase One Success



Event Participation

- Continued participation in professional speaking engagements
- Continued participation in general public events
- Distribution of materials at speaking engagements



Northern Kentucky
Water District

Phase One Success



Proactive Information Material Development

- Pharmacy Pamphlets for Adult Education
- Partners

Northern Kentucky
Water District

Phase One Success

Media Relations

- Open House Coverage- Game Winners
- Earth Day Water Conservation
- Sub-district G Funding
- Flagg Springs Fill Station
- Piner Fill Station
- AquaVenture Committee Award
- AMWA Award
- Meter Reading Upgrade (AMR)

Northern Kentucky
Water District

Phase One Success

Community Outreach

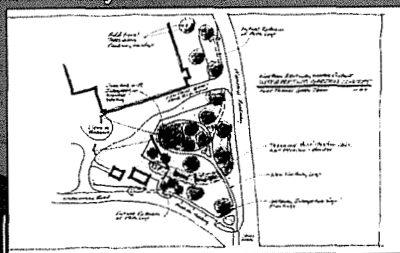
- Digital sign at Central Facility
- Water donation - Bottling program
- Bill Messages



Northern Kentucky
Water District

Phase One Success

Community Outreach: Green Efforts



Northern Kentucky
Water District

Phase Two

Curriculum Development

- Five Lessons
- Lesson Outline
- Experiments
- Material Development



Northern Kentucky
Water District

Phase Two

Develop New Presentations that Incorporate
NKWD Education Goals

Water Treatment
History
Overview of NKWD
Asset Management Plan
Infrastructure
Conservation
Green Efforts

Northern Kentucky
Water District

Phase Three

2010

- Implement programs in area schools
- More aggressive outreach to schools
- New community partnerships

Northern Kentucky
Water District

Board of Commissioners Meeting

AquaVenture 2009

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And Communication Committee
November 19, 2009

Northern Kentucky
Water District



Commissioner Training — 2009

7 – Item Seven No.