

DAVID A. RECKHOW

EDUCATION

<u>Degree</u>	<u>Institution</u>	<u>Dates</u>	<u>Major</u>
B.S.	Tufts University	1973-1977	Civil Engineering
M.S.	Stanford University	1977-1978	Civil Engineering
Ph.D.	University of North Carolina	1978-1984	Environmental Engineering

PROFESSIONAL POSITIONS

<u>Dates</u>	<u>Title</u>	<u>Employer</u>
1984-1985	Post-Doctoral Research Associate	Anjou Recherche, Compagnie Générale des Eaux (Paris)
1985-1990	Assistant Professor	Dept. of Civil & Env. Engineering, University of Massachusetts (Amherst)
1990-1998	Associate Professor	Dept. of Civil & Env. Engineering, University of Massachusetts (Amherst)
1998-present	Professor	Dept. of Civil & Env. Engineering, University of Massachusetts (Amherst)
2002-2005	Director	The Environmental Institute, University of Massachusetts (Amherst)
2003-2005	Director	Mass. Water Resources Research Center, University of Massachusetts (Amherst)
2007-2008	Interim Department Head	Dept. of Civil & Env. Engineering, University of Massachusetts (Amherst)
2014-present	Director	US EPA National Drinking Water Center (WINSSS), University of Massachusetts
2015-2017	Visiting Professor	Curtin University Department of Chemistry, Perth, Australia

REGISTRATION

EIT Certificate #11073: October, 1986

PROFESSIONAL HONORS AND AWARDS

1976	Tau Beta Pi
1980	Sigma Xi
1985	American Water Works Association, Academic Achievement Award for Best Ph.D. Dissertation for 1984, 2nd Place
1985	American Water Works Association, Award for the Best Research Paper for 1984
1988	United Technologies Corp, Outstanding Teaching Award (UMass)
1989	National Science Foundation Presidential Young Investigator Award

- 1989 University of Massachusetts, Engineering Alumni Association, Outstanding Junior Faculty Award
 1991 American Water Works Association, Award for the Best Research Paper for 1990
 1993 American Water Works Association, Award for the Best Research Division Poster for 1993, First Place (with Qing-wen Zhu, MS student).
 1994 Montgomery Watson/AEEP Master's Thesis Award, Advisor to 2nd Place finisher (Eric M. Hesse)
 1995 American Water Works Association, Academic Achievement Award for the Best MS Thesis for 1994, Advisor to 3rd Place finisher (Denise Springborg).
 1995 International Ozone Association's Harvey Rosen Award for the best paper in Ozone: Science and Engineering for the 2-year period, 1993-1994. (with Purnendu Bose and Boijayanta Bezbarua, PhD students)
 1998 American Water Works Association, Academic Achievement Award for the Best PhD Dissertation for 1997, Advisor to 2nd Place finisher (Boijayanta Bezbarua).
 2001 Harbin Institute of Technology, Honorary Visiting Professor, Harbin, China
 2009 American Water Works Association, Water Science & Research Division Best Paper Award (with Guanghui Hua)
 2010 Boston Society of Civil Engineers, Lester Gaynor Award
 2012 AEESP Lecturer at AWWA Annual Conference
 2012 Northeast Dianli University, Visiting Professor, Jilin, China
 2013 Tufts University CEE Alumnus of the Year
 2015 AEESP Outstanding Publication Award
 2016 UMass Conti Fellowship
 2017 UMass Distinguished Faculty Lecturer

JOURNAL EDITORSHIP

1993-1998 Ozone: Science and Engineering; Associate Editor

AREAS OF GRADUATE TEACHING RESPONSIBILITY

Physical and Chemical Processes for Water and Wastewater Treatment
 Aquatic Chemistry and Environmental Kinetics
 Water Quality Modeling
 Methods of Chemical Analysis in Environmental Engineering
 Biological Processes for Wastewater Treatment

INSTRUCTOR OF SHORT COURSES AND WORKSHOPS

Wastewater Treatment Plant Operators Workshop (Massachusetts) Analytical Methods for WWTP Personnel (1986)
 Institute in Drinking Water Chemistry and Drinking Water Treatment UMass, Institute Faculty (1988, 1989, 1993 - present)
 Workshop on "Ozone in Water Treatment: Application and Engineering," Amer. Wat. Wrks. Assn. Res. Fnd., St. Louis (1990)
 Workshop on "Current Approaches to Disinfection and Oxidation Strategy," NE Regional Env. Publ. Hlth. Cntr., Amherst, MA (1991)
 Hazardous Waste Site Engineering Short Course (1995), Ft. Devens, MA
 Workshop on "Disinfection By-products in Drinking Water: Critical Issues in Health Effects Research," USEPA and ILSI, Chapel Hill, NC (1995)
 Workshop on Health Effects for EPA's RegNeg Committee, Washington, DC (1999)
 Workshop on Disinfection Byproducts, Health Effects and Impacts of Ozone, Harbin China (2001)
 Short Course on Ozone Applications for Small Drinking Water Systems, Penn State U., Harrisburg (2001)

AREAS OF CURRENT RESEARCH INTEREST

Formation and Control of Disinfection By-products in Drinking Water and Wastewater Treatment

Ozonation in Drinking Water and Wastewater Treatment
Naturally Occurring and Synthetic Organic Chemicals, and their Fate in Water Treatment and the Natural Aquatic Environment
Interactions of Aluminum and Calcium with Organic Matter in Natural and Engineered Systems
Catalytic Water Treatment Systems and Advanced Oxidation
New Techniques for Monitoring Water Quality: micro field devices & bench-top lab methods
Watershed sources of Natural Organic Matter

REVIEW FOR JOURNALS (selected titles)

Journal of the American Water Works Association
Organic Geochemistry
Environmental Science and Technology
Industrial and Engineering Chemistry
Ozone: Science and Engineering
ASCE Journal of the Environmental Engineering Division
Journal of Water Supply Research and Technology - AQUA

REVIEW FOR COMPETITIVE GRANTS PROGRAMS (selected groups)

National Science Foundation, US
National Centers for Excellence, NRC Canada
Water Research Foundation (formerly AWWARF), US
Industrial Chair Program, NSERC, Canada
Environmental Protection Agency, US
Discovery Grant Program, NSERC, Canada

NATIONAL AND INTERNATIONAL COMMITTEES

1981	International Humic Substances Society: Founding Committee
1985-1991	American Water Works Association - Student Activities Committee
1985-1988	Standard Methods - Chairman of Joint Task Group for Total Organic Halide
1987-present	Water Research Foundation (formerly AWWARF) - Project Advisory Committees
1988-1991	American Water Works Association Research Foundation - Compagnie Generale des Eaux, Chairman for Joint Project on Ozone.
1988-1993	International Ozone Association Editorial Board
1995-2000	International Ozone Association: numerous conference planning committees
1996-2000	American Water Works Association - Organic Contaminants Committee
1995-1999	American Water Works Association - Water Quality & Treatment
2001-2005	Water Research Foundation (formerly AWWARF); Public Council Board Member
2003-2007	Water Research Foundation (formerly AWWARF); Research Advisory Council
2003-2007	National Research Council, Panel on Water System Security Research
2008	Water Research Foundation (formerly AWWARF); Unsol. Proposal Review Comm.
2013-2016	AWWA Water Science & Research Division Trustee

REFEREED JOURNAL PUBLICATIONS

Reckhow, D.A. and P.C. Singer, "Removal of Organic Halide Precursors by Pre-ozonation and Alum Coagulation," Journal of the American Water Works Association, Vol. 76, No. 4, pp. 151-157 (1984).

Reckhow, D.A., B. Legube and P.C. Singer, "The Ozonation of Organic Halide Precursors: Effect of Bicarbonate," Water Research, 20(8)987-998 (1986).

Ostendorf, D.W., D.A. Reckhow and D.J. Popielarczyk, "Vertical Transport Processes in Unconfined Aquifers," Journal of Contaminant Hydrology, Vol. 4, pp. 93-107 (1989).

Croue, J.-P., and D.A. Reckhow, "The Destruction of Chlorination Byproducts with Sulfite," Environmental Science & Technology, 23:1412-1419 (1989).

Reckhow, D.A., C. Hull, E. Lehan, J.M. Symons, H.-S. Kim, Y.-M. Chang, L. Simms, R.C. Dressman, and H. Pourmoghaddas, "Determination of Total Organic Halide in Water: An Interlaboratory Comparative Study of Two Methods," International Journal of Environmental Analytical Chemistry, 38:1-7 (1990).

Reckhow, D.A. and P.C. Singer, "Chlorination Byproducts in Drinking Waters: From Formation Potentials to Finished Water Concentrations," Journal of the American Water Works Association, 82:4:173-180 (1990).

Reckhow, D.A., D.W. Ostendorf and M.E. Billa, "Combined Residual Chlorine Fate and Transport in Small Stream," ASCE Journal of the Environmental Engineering Division, 116:6:1125-1142 (1990).

Reckhow, D.A., P.C. Singer and R.L. Malcolm, "Chlorination of Humic Materials: Byproduct Formation and Chemical Interpretations," Environmental Science & Technology, 24:11:1655-1664 (1990).

Reckhow, D.A. and J.K. Edzwald, "A Laboratory Evaluation of the Bromoform and Iodoform Formation Potential Tests," Journal of the American Water Works Association, 83:5:67-74 (1991).

Knocke, W.R., J.E. Van Benschoten, M.J. Kearney, A.W. Soborski and D.A. Reckhow, "Kinetics of Manganese and Iron Oxidation by Potassium Permanganate and Chlorine Dioxide," Journal of the American Water Works Association, 83:6:80-87 (1991).

Reckhow, D.A., W.R. Knocke, M.J. Kearney, and C.A. Parks, "Oxidation of Iron and Manganese by Ozone," Ozone Science and Engineering, 13:6:675-695 (1991).

Xie, Y., R.V. Rajan and D.A. Reckhow, "Mass Spectra of Synthesized Mixed Bromochloroacetic Acids," Organic Mass Spectrometry, 27:807-810 (1992).

Xie, Y. and D.A. Reckhow, "Formation of Ketoacids in Ozonated Drinking Water," Ozone: Sci. & Eng., 14:269-275 (1992).

Xie, Y. and D.A. Reckhow, "Identification of Trihaloacetaldehydes in Ozonated and Chlorinated Fulvic Acid Solutions," Analyst 118:1:71-72 (1993).

Hull, C.S. and D.A. Reckhow, "Removal of DOX and its Precursors in Municipal Wastewater Treatment," Water Research, 27:3:419-425 (1993).

Xie, Y. and D.A. Reckhow, "A Rapid and Simple Analytical Method for Cyanogen Chloride and Cyanogen Bromide in Drinking Water," Water Research, 27:3:507-511 (1993).

Xie, Y., D.A. Reckhow and R.V. Rajan, "Spontaneous Methylation of Haloacetic Acids in Methanolic Stock Solutions," Environ. Sci. Technol., 27:6:1232-1234 (1993).

Tobiason, J.E., J.K. Edzwald, D.A. Reckhow and M.S. Switzenbaum, "Effect of Pre-ozonation on Organics Removal by In-line Direct Filtration," Wat. Sci. Tech. 27:11:81-90 (1993).

Bose, P., B.K. Bezbarua and D.A. Reckhow, "Effect of Ozonation on Some Physical and Chemical Properties of Aquatic Natural Organic Matter," Ozone: Sci. Eng. 16(2):89-112 (1994).

Xie, Y. and D.A. Reckhow, "Formation of Halogenated Artifacts in Brominated, Chloraminated, and Chlorinated Solvents," Environ. Sci. Technol., 28:7:1357-1360 (1994).

Tobiason, J.E., Reckhow, D.A., & Edzwald, J.K. "Effects of Ozonation on Optimal Coagulant Dosing in Drinking Water Treatment". Aqua, 44:3: 142-150. (1995)

Xie, Y. and D.A. Reckhow, "Development of a Method to Identify Ketoacids in Ozonated Fulvic Acid Solutions," Journal of Mass Spectrometry, 32:99-102 (1997).

Bose, P., D.A. Reckhow, "Modeling pH and Ionic Strength Effects on Proton and Calcium Complexation of Fulvic Acid: A Tool for Drinking Water-NOM Studies" Environmental Science & Technology, 31:3:765-770 (1997).

Xie, Y., D.A. Reckhow and D.C. Springborg, "Analyzing HAAs and Ketoacids without Diazomethane" Journal of the American Water Works Association, 90:4:131-138 (1998)

Garvey, Elisa; Tobiason, John E.; Hayes, Michael; Wolfram, Evelyn; Reckhow, David A., and Male, James W. Coliform Transport in a Pristine Reservoir: Modeling and Field Studies. Water Science and Technology. 1998; 37(2):137-144.

Bose, P., D.A. Reckhow, "Adsorption of Natural Organic Matter on Preformed Aluminum Hydroxide," ASCE Journal of the Environmental Engineering Division, 124:9:803-811 (1998).

Reckhow, D.A., T.L. Platt, A.M. MacNeill, J.N. McClellan, "Formation and Degradation of DCAN in Drinking Waters", AQUA, 50(1)1-13 (2001).

Pines, D.S., Reckhow, D.A., "Effect of Dissolved Co(II) on the Ozonation of Oxalic Acid", Environ. Sci. Technol. 36(19)4046-4051 (2002).

Pines, D.S., Reckhow, D.A., "Solid Phase Catalytic Ozonation Process for the Destruction of a Model Pollutant", Ozone Science & Engineering 25:1:25-39 (2003).

Corbin, M.J., D.A. Reckhow, J.E. Tobiason, and G.S. Kaminski, Controlling DBPs by Delaying Chlorine Addition Until After Filtration, Journal of the New England Water Works Association 117(4)243-251 (2003).

Bezbarua B.K. and D.A. Reckhow, Modification of the Standard Neutral Ozone Decomposition Model, Ozone: Science and Engineering, 26(4)345-357 (2004).

Choi W-W, Reckhow DA. Fluorimetric Determination of Dichloroacetamide by RPLC With Postcolumn Detection. Bulletin of the Korean Chemical Society. (2004) 25:900-906.

Reckhow, DA, PL Rees and D Bryan, "Watershed Sources of Disinfection Byproduct Precursors", Water Science and Technology: Water Supply, (2004) 4:4:61-69.

Reckhow, D.A., Rees, P.L., Makkissy, G., and Bryan, D. (2005) Factors Affecting NOM Reactivity with Chlorine. In: Humic Substances: Molecular Details and Application in Land and Water Conservation, Gabbour, E.A. and Davies, G. (eds), pp. 117-129, Taylor & Francis, Inc., New York.

Pines, D.S., M-N Min, D.A. Reckhow and S.J. Ergas, "Investigation of an Ozone Membrane Contactor System," Ozone: Science and Engineering, 27:209-217 (2005)

Hua, G and D.A. Reckhow, "Determination of TOCl, TOBr, and TOI in Drinking Water by Pyrolysis and Off-line Ion Chromatography," Anal. Bioanal. Chem. 384:2:495-504 (2006).

Hua, G., DA Reckhow, and J. Kim, "Effect of Bromide and Iodide Ions on the Formation and Speciation of Disinfection Byproducts During Chlorination," Environmental Science and Technology. 40: 3050-3056 (2006).

Leshem E.N., D.S. Pines, S.J. Ergas and D.A. Reckhow, "Electrochemical Oxidation and Ozonation for Textile Wastewater Reuse," ASCE Journal of Environmental Engineering 132:3:324-330 (2006).

Ergas, S.J., B.M. Therriault and D.A. Reckhow, "Evaluation of Water Reuse Technologies for the Textile Industry", ASCE Journal of Environmental Engineering, 132:3:315-323 (2006)

Hua, G. and Reckhow D A. Comparison of disinfection byproduct formation from chlorine and alternative disinfectants. Water Research, 41:8:1667-1678 (2007).

Hua, G. and Reckhow D. A. Characterization of Disinfection Byproduct Precursors Based on Hydrophobicity and Molecular Size. Environmental Science and Technology 41:9:3309-3315 (2007).

Bose P, Reckhow DA. The Effect of Ozonation on Natural Organic Matter Removal by Alum Coagulation. Water Research (2007); 41: 1516-1524.

Liu, B, Reckhow, D.A., Tarnauskas, R.J., Karalekas, P.C., and Borgatti, D. Beavers and Disinfection Byproduct Precursors in the Springfield Water and Sewer Commission Cobble Mountain Reservoir. Journal of the New England Water Works Association 121[2], 113-128. (2007).

Hua, G. and Reckhow D.A., Hydrophobicity and Molecular Size Distribution of Unknown TOX in Drinking Water, Journal of Environmental Engineering - ASCE, 134:3:152-160 (2008).

Hua, G. and Reckhow D.A., DBP Formation During Chlorination and Chloramination: Effect of Reaction Time, pH, Dosage, and Temperature, Journal AWWA, 100:8:82-95 (2008).

Ho, C. Wong, K., and Reckhow, D. A. (2008), "An Evaluation of the Methodology in Analyzing Compost for Erosion Control," Trans. Res. Rec., Trans. Res. Brd., 2044: 107-115

Reckhow, D. A., Linden, K. G., Kim, J., Shermer, H., and Makdissy, G. (2010). "Impact of UV Treatment on the Formation of Disinfection Byproducts." Journal American Water Works Association., 102:6:100-113.

Moffatt, L.T., May, C.L., Studer, K.E., Reckhow, D.A. and Arcaro, K.F. (2010) Effects of exposure water volume, depuration time, and feeding status on vitellogenin mRNA induction in male medaka (*Oryzias latipes*) exposed to 17 beta-estradiol. Ecotoxicology and Environmental Safety 73(8), 1835-1841.

Bull, R.J., Reckhow, D.A., Li, X.F., Humpage, A.R., Joll, C. and Hrudey, S.E. (2011) Potential carcinogenic hazards of non-regulated disinfection by-products: Haloquinones, halo-cyclopentene and cyclohexene derivatives, N-halamines, halonitriles, and heterocyclic amines. Toxicology 286(1-3), 1-19.

Hua, G. and Reckhow, D.A. (2012) Effect of Alkaline pH on the Stability of DBPs. Journal American Water Works Association., 104(2), 49-50.

Hua, G.H. and Reckhow, D.A. (2012) Evaluation of Bromine Substitution Factors of DBPs during Chlorination and Chloramination. Water Research 46(13), 4208-4216.

Hua, G.H. and Reckhow, D.A. (2013) Effect of pre-ozonation on the formation and speciation of DBPs. Water Research 47(13), 4322-4330.

Liu, B.N. and Reckhow, D.A. (2013) DBP Formation in Hot and Cold Water Across a Simulated Distribution System: Effect of Incubation Time, Heating Time, pH, Chlorine Dose, and Incubation Temperature. Environmental Science & Technology 47(20), 11584-11591.

Weiss, W.J., Schindler, S.C., Freud, S., Herzner, J.A., Hoek, K.F., Wright, B.A., Reckhow, D.A. and Becker, W.C. (2013) Minimizing raw water NOM concentration through optimized source water selection. Journal American Water Works Association 105(10), 73-74.

- Zimmers, S., O'Keefe, P., Anderton, D., Browne, E., Reckhow, D.A. and Arcaro, K.F. (2014) Determination of Free Bisphenol A (BPA) Concentrations in Breast Milk of U.S. Women Using a Sensitive LC/MS/MS Method. *Chemosphere* 104: 237-243
- Liu, B.N., Reckhow, D.A. and Li, Y. (2014) A two-site chlorine decay model for the combined effects of pH, water distribution temperature and in-home heating profiles using differential evolution. *Water Research* 53, 47-57.
- McGuire, M.J., Karanfil, T., Krasner, S.W., Reckhow, D.A., Roberson, J.A., Summers, R.S., Westerhoff, P. and Xie, Y.F. (2014) Not your granddad's disinfection by-product problems and solutions. *Journal American Water Works Association* 106(8), 54-73.
- Hua, G.H., Kim J.S. and Reckhow, D.A. (2014) Disinfection Byproduct Formation from Lignin Precursors. *Water Research* 63: 285-295.
- Stanford, B.D., Reinert, A.M., Rosenfeldt, E.J., Dryer, D., Park, MH and Reckhow D.A. (2014) Sampling Frequency, Location and Reporting Limit Influence on Benchmarking EDC/PPCPs", . *Journal American Water Works Association* 106(9), 113-114.
- Park, M., Reckhow, D., Lavine, M., Rosenfeldt, E., Stanford, B. and Park, M.H. (2014) Multivariate Analyses for Monitoring EDCs and PPCPs in a Lake Water. *Water Environment Research* 86(11), 2233-2241.
- Ma, J., Reckhow, D. and Xie, Y.F. (2015) Drinking water safety: science, technology, engineering and policy. *Frontiers of Environmental Science & Engineering* 9(1), 2-2.
- Liu, B., and Reckhow, D.A. (2015) Disparity in Disinfection Byproduct Concentration between Hot and Cold Tap Water. *Water Research* 70, 196-204.
- Jiang, Y., J.E. Goodwill, J.E. Tobiason and D.A. Reckhow (2015) Effect of Different Solutes, Natural Organic Matter, and Particulate Fe (III) on Fe (VI) Decomposition in Aqueous Solution, *Environmental Science & Technology* 49:5:2841-2848.
- Hua, G., D.A. Reckhow and I. Abusallout, (2015) "Correlation between SUVA and DBP Formation during Chlorination and Chloramination of NOM Fractions from Different Sources" *Chemosphere* 130: 82-89.
- Goodwill, J.; Jiang, Y.; Reckhow, D.A.; Gikonyo, J.; and Tobiason, J.E., (2015) "Characterization of Particles from Ferrate Pre-oxidation" *Environmental Science & Technology* 49:8:4955-4962
- Yu, Yun and Reckhow, D.A., (2015) "Kinetic Analysis of Haloacetonitrile Stability in Drinking Waters" *Environmental Science & Technology* 49:18:11028-11036.
- Yu, Yun; Steinschneider, Scott; and Reckhow, D.A. (2015) Evaluation of Environmental Degradation Kinetics Using Hierarchical Bayesian Modeling, *Journal of Environmental Engineering*, 141:12:06015008.
- Goodwill, J.; Jiang, Y.; Reckhow, D.A.; Gikonyo, J.; and Tobiason, J.E., (2016) "Laboratory assessment of ferrate for drinking water treatment" *Journal AWWA*, 108:3:80.
- Jiang Y, Goodwill JE, Tobiason JE, Reckhow DA. (2016) Impacts of ferrate oxidation on natural organic matter and disinfection byproduct precursors. *Water Research*. 96:114-25.
- Jiang Y, Goodwill JE, Tobiason JE, Reckhow DA. Bromide oxidation by ferrate(VI): The formation of active bromine and bromate. (2016) *Water Research*. 96:188-97
- Hagemann M, Park M, Srinivasan V, Reckhow DA, Lavine M, Rosenfeldt E, et al. (2016) Co-occurrences of EDCs and PPCPs in Surface Water Using Chemometrics. *Journal American Water Works Association*. 108(4):70-.

Goodwill JE, Mai XY, Jiang YJ, Reckhow DA, Tobiason JE. (2016) Oxidation of manganese(II) with ferrate: Stoichiometry, kinetics, products and impact of organic carbon. *Chemosphere*. 2016;159:457-64.

Wang T, Reckhow DA. Spectrophotometric Method for Determination of Ozone Residual in Water Using ABTS: 2,2'-Azino-Bis (3-Ethylbenzothiazoline-6-Sulfonate). (2016) *Ozone-Science & Engineering*. 38(5):373-81.

Yu, Yun and Reckhow, D.A., (2017) "The Formation and Occurrence of *N-chloro-2,2-dichloroacetamide* Instead of 2,2-dichloroacetamide in Chlorinated Drinking Waters" *Environmental Science & Technology*. 51(3):1488-97.

Sayess, R. and Reckhow, D.A. (2017) "An Improved Method for Total Organic Iodine in Drinking Water", *Water Research*, 108; 250-259.

Nihemaiti M, Le Roux J, Hoppe-Jones C, Reckhow DA, Croue JP. Formation of Haloacetonitriles, Haloacetamides, and Nitrogenous Heterocyclic Byproducts by Chloramination of Phenolic Compounds. *Environmental Science & Technology*. 2017;51(1):655-63.

Sayess R, Khalil A, Shah M, Reckhow DA, Godri Pollitt KJ. Comparative Cytotoxicity of Six Iodinated Disinfection Byproducts on Nontransformed Epithelial Human Colon Cells. *Environmental Science & Technology Letters*. 2017. 4(4):143-8.

Sturgeon SR, Pilsner JR, Arcaro KF, Ikuma K, Wu H, Kim SM, et al. White blood cell DNA methylation and risk of breast cancer in the Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial (PLCO). *Breast Cancer Research*. 2017;19.

Russell CG, Brown RA, Porter K, Reckhow D. Practical Considerations for Implementing Nitrosamine Control Strategies. *Journal American Water Works Association*. 2017;109(6):E226-E42.

Jiang Y, Goodwill JE, Tobiason JE, Reckhow DA. (2017) Comparison of the effects of ferrate and ozone pre-oxidation on disinfection byproduct formation potentials. *Water Research*. 2017 (in preparation).

Mohan A, Reckhow DA. Occurrence, formation and persistence of Halobenzoquinones: A case study on 2, 6-Dichloro-1, 4-benzoquinone. 2017 (in preparation).

OTHER PUBLISHED MATERIAL IN REFEREED JOURNALS

Xie, Y., and D.A. Reckhow, D. A. Comment on "Identification of Halogenated Compounds in Chlorinated Seawater and Drinking Water Produced Offshore Using n-Pentane Extraction and Open-Loop Stripping Technique". *Environmental Science & Technology* Vol. 30(2), 720. (1996)

CHAPTERS IN BOOKS (LIGHTLY REFEREED)

Reckhow, D.A. and P.C. Singer, "Mechanisms of Organic Halide Formation During Fulvic Acid Chlorination and Implications with Respect to Pre-ozonation," in *Water Chlorination: Environmental Impact and Health Effects*, Vol. 5, pp. 1229-1257, (Lewis Publishers, Inc., Chelsea, MI, 1985).

Xie, Y. and D.A. Reckhow, "Hydrolysis and Dehalogenation of Trihaloacetaldehydes," In R.A. Minear, & G.L. Amy (Editors), *Disinfection By-Products in Water Treatment: The Chemistry of Their Formation and Control*, pp283-291, Lewis Publ., New York (1996).

McClellan, J.N., Reckhow, D.A., Tobiason, J.E., Edzwald, J.K., & Hess, A.F. (1996). Empirical Models for Chlorination "By-products: Four Years of Pilot Experience in Southern Connecticut". In R.A. Minear, & G.L. Amy

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Reckhow, David A. and Olin, Stephen S. Contaminant Characteristics. In: Olin, Stephen S., Editor. Exposure to Contaminants in Drinking Water: Estimating Uptake through the Skin and by Inhalation. Boca Raton, FL: CRC Press; 1998

John, Theodore; Hakkinen, P. J., and Reckhow, David A. Exposure Characteristics. In: Olin, Stephen S., Editor. Exposure to Contaminants in Drinking Water: Estimating Uptake through the Skin and by Inhalation. Boca Raton, FL: CRC Press; 1998.

Reckhow, D.A. "Control of Disinfection By-Product Formation Using Ozone". In: Singer, P.C., Editor. Formation and Control of Disinfection By-Products in Drinking Water. Denver, CO: American Water Works Association; pp. 179-204, (1999).

Singer, P.C. and D.A. Reckhow "Chemical Oxidation". In: Letterman, R.D., Technical Editor. Water Quality and Treatment, 5th ed. New York: McGraw-Hill, Inc.; p. 12.1-12.51, (1999).

McClellan, J.N.; D.A. Reckhow, J.E. Tobiason, J.K. Edzwald and D.B. Smith, "A Comprehensive Kinetic Model for Chlorine Decay and Chlorination Byproduct Formation" In Krasner, S.W.; Barrett, S.E., and Amy, G.L. Editors, Natural Organic Matter and Disinfection By-Products: Characterization and Control in Drinking Water; Washington, DC: ACS: pg. 223-246, (2000).

Bull, R.J., Reckhow, D.A., "Use of chemical models and structure-activity relationships to identify novel disinfection by-products of potential toxicological concern," pp. 51-64 in Occurrence, Formation, Health Effects and Control of Disinfection Byproducts in Drinking Water, T. Karanfil, S.W. Krasner, P. Westerhoff and Y. Xie, editors, ACS Symposium Series 995, American Chemical Society (2008).

Hua, G., Reckhow, D.A., "Relationship between Brominated THMs, HAAs and Total Organic Bromine during Drinking Water Chlorination," pp. 108-123 in Occurrence, Formation, Health Effects and Control of Disinfection Byproducts in Drinking Water, T. Karanfil, S.W. Krasner, P. Westerhoff and Y. Xie, editors, ACS Symposium Series 995, American Chemical Society (2008).

Reckhow, D.A., Makdissy, G., Rees, P.S. "Disinfection Byproduct Precursor Content of Natural Organic Matter Extracts," pp. 80-94 in Occurrence, Formation, Health Effects and Control of Disinfection Byproducts in Drinking Water, T. Karanfil, S.W. Krasner, P. Westerhoff and Y. Xie, editors, ACS Symposium Series 995, American Chemical Society (2008).

Reckhow, D. A., and Singer, P. C. (2011). "Disinfection Byproducts." Chapter 19 in: *Water Quality and Treatment*, J. K. Edzwald, ed., AWWA, Denver.

Singer, P. C., and Reckhow, D. A. (2011). "Chemical Oxidation." Chapter 7 in: *Water Quality and Treatment*, J. K. Edzwald, ed., AWWA, Denver.

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McClellan, J.N., D.A. Reckhow, and J.E. Tobiason, "Removal of THM and HAA Precursors Using Ozone and Biologically Active Granular Activated Carbon," poster presentation, American Water Works Association, Annual Conference, Toronto, 23-27 June, 1996.

Reckhow, D.A., J.E. Tobiason, W. Pouvesle, J.N. McClellan, J.K. Edzwald, and D. Smith "Evolution of Natural Organic Matter Through a Drinking Water Distribution System," oral presentation, NOM Workshop, Poitiers, France, 18-19 September 1996.

Reckhow, D.A., "Formation and Stability of DBPs in Drinking Water, oral presentation, American Water Works Association, Water Quality Technology Conference, Boston, MA, 17-21 November, 1996.

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Reckhow, D.A. "Effect of Alternative Oxidants on NOM," South Carolina Section of AWWA, Workshop on DBPs, Greenville, SC, 23-24 January 1997

Reckhow, D.A. "Effect of Ozone on Disinfection Byproducts," South Carolina Section of AWWA, Workshop on DBPs, Greenville, SC, 23-24 January 1997

Reckhow, D.A. "Formation and Loss of Brominated Disinfection Byproducts in Drinking Water," OrgaBrome '97, Baton Rouge, LA, 3-7 February 1997

Reckhow, D.A. "Formation and Persistence of Ozonation Byproducts," Symposium on Disinfection Byproducts, University of Houston, 20-21 March 1997.

Pines, D.S. and D.A. Reckhow, "An Aqueous Phase Homogeneous Catalytic Ozonation Process for Removal of Hydrophilic Organic Compounds," Seventh International Symposium on Chemical Oxidation, Vanderbilt Univ., Nashville, TN, 9-11 April 1997.

Bezbarua, B.K. and D.A. Reckhow, "Modeling Reaction Kinetics of Ozone with Natural Organic Matter", 13th Ozone World Congress, Oct 26-31, 1997, Kyoto, Japan

Reckhow, D.A., "Oxidation: Ozone and AOPs Reactivity with NOM," American Water Works Association Water Quality Technology Conference, Nov 9, 1997, Denver, CO.

Reckhow, D.A., "Overview of Available Methods and What is Needed," Workshop on the Identification of New and Uncharacterized Disinfection By-products in Drinking Water, Feb 11-13, 1998, Washington, DC

Reckhow, D.A. "Analysis of Disinfection Byproducts using new Derivatizing Reagents" oral presentation, American Water Works Association, Water Quality Technology Conference, San Diego, CA, 1 November, 1998

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Reckhow, D.A., "Formation and Persistence of Disinfection Byproducts," NEWWA Symposium: Responding to the New Drinking Water Regulations: New England's Banancing Act, April 28, 1999, Marlborough, MA

Reckhow, D.A., "Understanding the Basics of DBP Formation," NYSERDA Small Reservoir Conference, June 16, 1999, Albany, NY.

Reckhow, D.A., "Treatment Options for Disinfection Byproduct Control," NYSERDA Small Reservoir Conference, June 16, 1999, Albany, NY.

Reckhow, D.A., "Disinfection Chemistry and Byproduct Formation," AWWA Water Quality Technology Conference, Tampa, FL October 31, 1999

Hodgkins, L.J., D.A. Reckhow, J.E. Tobaison, J.K. Edzwald, S. Seckinger and T. Toolan, "Measurement and Characterization of Biodegradable Dissolved Organic Carbon in the MWRA Drinking Water Supply and Distribution System," AWWA Water Quality Technology Conference, Tampa, FL November 3, 1999.

Reckhow, D.A., J.N. McClellan and T. Rapp "Compound Stability and Artifacts in HAA Analysis," AWWA Water Quality Technology Conference, Salt Lake City, UT, November 5, 2000

Reckhow, D.A., T. Rapp and T. Wu, "Chemistry and Occurrence of Dichloroacetamide", poster presentation at the AWWA Microbial/Disinfection By-products Health Effects Symposium, March 24-26, 2001, Lisle, Illinois
Leshem, E., B.M. Therriault, S.J. Ergas and D.A. Reckhow (2001) "Evaluation of Technologies for Zero Discharge in the Textile Industry," Proceedings of the Green Chemistry Research Symposium, Conte Center for Polymer Research, Amherst, MA, October 29-30.

Reckhow, D.A. "Ozonation Chemistry and Byproduct Chemistry," invited oral presentation, American Water Works Association, Water Quality Technology Conference, Nashville, TN, 11 November, 2001

Von Stechow, C., D.A. Reckhow, "Mixed Ozonation-Chlorination Byproducts" September 2001, Berlin

Leshem, E.N., S.J. Ergas and D.A. Reckhow, "Textile Wastewater Recycling by Electrochemical Oxidation", ACS National Meeting, August 18-22, 2002, Boston, MA.

Reckhow, D.A. "Occurrence and Control of Disinfection Byproducts in Drinking Water" International Water Association, March 8, 2002, New Orleans, LA.

Reckhow, D.A., "Formation of Halogenated Compounds from the Reactions of Chlorine with NOM", Int. Humic Substances Soc. International Meeting, July 26, 2002, Boston, MA

Corbin, M.J. and D.A. Reckhow, "Benefits of Shifting to Post-filter Chlorination," Annual Meeting of the New England Water Works Association, September 25, 2002, Hyannis, MA.

Reckhow, D.A. "Chemistry of Chlorination and Ozonation Byproducts," Water Quality Technology Conference, November 10, 2002, Seattle, WA.

Reckhow, D.A., "Reactivity of Organic Nitrogen and Formation of Nitrogenous DBPs", invited oral presentation, American Water Works Association National Conference, June, 2003, Anaheim, CA.

Reckhow, D.A., Pines, D.S. K. Min, S.J. Ergas, "Investigation of an Ozone Membrane Contactor System," oral presentation at the World Ozone Congress, Las Vegas, NV September 2003, IOA.

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Reckhow, D. and P. Rees, "Watershed Sources of DBP Precursors", oral presentation at the conference, NOM Research: Innovations and Applications for Drinking Water, March 4-6, 2004, Adelaide, Australia.

Reckhow, D. and G. Makdissy, "Factors Affecting NOM Reactivity with Chlorine", keynote address at the conference, Humic Substances VII, March 17-19, 2004, Boston.

Wobma, P., William Bellamy, Duane Griffin., Kelly Kjartanson, James Malley, David Reckhow "UV for Primary Disinfection and DBP Control for an Unfiltered Water Supply" oral presentation, British Columbia Water & Waste Association 2004 Annual Meeting and Conference, May 1 - 5, 2004, Whistler, B.C. Canada

Reckhow, DA, "Managing your Water Quality to Minimize DBPs", oral presentation at the New England Water Works Association Symposium, May 20, 2004, Boxborough, MA.

Reckhow, DA, "Characteristics of NOM that Contribute to DBP Formation", oral presentation, Water Quality Technology Conference. November 14, 2004, San Antonio, TX.

Bull RJ, M Bull, and DA Reckhow, "Use of Quantitative Structure Toxicity Relationships (QSTR) to Identify Disinfection Byproducts of Potential Health Importance", oral presentation, Water Quality Technology Conference. November 15, 2004, San Antonio, TX.

Kim, J, DA Reckhow, and G Hua, "Analysis of Lignin in NOM Using Alkali CuO Oxidation Method", oral presentation, Water Quality Technology Conference. November 16, 2004, San Antonio, TX.

Hua, G., and DA Reckhow, "Determination of TOCl, TOBr, and TOI in Drinking Water by Pyrolysis and Off-line Ion Chromatography", oral presentation, Water Quality Technology Conference. November 16, 2004, San Antonio, TX.

Hua, G., and DA Reckhow, "Effect of Bromide and Iodide Ions on the Formation and Speciation of DBPs During Chlorination", oral presentation, Water Quality Technology Conference. November 17, 2004, San Antonio, TX.

Reckhow, DA, RJ Bull, V Rotello and J Kim, "Disinfection Byproduct Formation from Key Nitrogenous Precursors", oral presentation, Water Quality Technology Conference. November 17, 2004, San Antonio, TX.

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Makdissy, G. and DA Reckhow, "NOM Fractionation and Subsequent Reactivity with Chlorine," oral presentation at the conference, Humic Substances VIII, March 16-18, 2005, Boston.

Reckhow, DA, "Formation and Degradation of DBPs from Chlorine and Alternative Disinfectants," oral presentation, MI Section, AWWA, May 17, 2005.

Boutin, A., P.L. Rees, DA Reckhow and G. Devine, "A National Survey of TOC Trends in Relation to Watershed Characteristics and DBP Formation Potential" AGU National Meeting, New Orleans, LA May 23-27, 2005

Reckhow, DA, "Occurrence and Behavior of Non-regulated DBPs in Distribution Systems", US EPA Workshop on Optimizing the Design and Interpretation of Epidemiologic Studies to Consider Alternative Disinfectants of Drinking Water, Raleigh, NC June 2, 2005

Kim, J., DA Reckhow, V Rotello, and RJ Bull, "Comparing Disinfection Byproduct Formation from Trimethoxy Aromatic Compounds, an Important Family of Lignin Monomers", poster presentation, AWWA Annual Conference, June 12-16, 2005; San Francisco, CA.

Hua, G., DA Reckhow, "Characterization of Unknown TOX Precursors based on Hydrophobicity and Molecular Size", oral presentation, AWWA Annual Conference, June 12-16, 2005; San Francisco, CA.

Sachdeva, R., PG Hatcher, S. Kim, AG Marshall, RP Rogers and DA Reckhow, „Characterization of Total Organic Halogen (TOX) Produced During Disinfection Processes by ESI-TOF MS and ESI-FTICR MS“ poster presentation, EMSI/North Central NOM Workshop, Columbus, OH, June 15-17, 2005

Reckhow, DA., Bose, P., Hesse, Eric R., and Lewis, E. New Approaches to DBP Precursor Characterization and Control: Application to Ozonation and Multi-stage Coagulation. International Workshop on Novel and Enhanced Water Treatment Technologies, Tianjin, China, September 6-7, 2005, Keynote Address.

Reckhow, DA, “Chloramination for DBP Control,” oral presentation, Water Quality Technology Conference, November 6-10, 2005 (SUN); Quebec City, Que.

Kim, J., DA Reckhow, “Influence of DBPs formation on Amino Acids in NOM”, poster presentation, Water Quality Technology Conference, November 6-10, 2005 (DPB session MON1); Quebec City, Que.

Hua, G., DA Reckhow, “Comparison of total organic halogen formation from various disinfection processes”, oral presentation, Water Quality Technology Conference, November 6-10, 2005 (TUE1); Quebec City, Que.

Hua, G., DA Reckhow, “Factors affecting the formation and destruction of TOX in drinking water”, oral presentation, Water Quality Technology Conference, November 6-10, 2005; Quebec City, Que.

Makdissy, G., DA Reckhow, “DBP Formation Potentials of Natural Organic Matter”, oral presentation, Water Quality Technology Conference, November 6-10, 2005 (WED1); Quebec City, Que.

Reckhow, DA, EM Hesse, P. Bose, BK Bezbarua & E. Lewis. “Role of Ozone in NOM Removal and DBP Control”, USA-Vietnam Workshop on Water Pollution Prevention Technologies, Hanoi, Vietnam; 15-18 Nov 2005

Reckhow, DA, PL Rees, SC Long, A Hansen, D Ganesan, “The Blackstone River EFF and next Generation of Cyberinfrastructure,” oral presentation at the Workshop on CLEANER, March 6, 2006, Arlington, VA.

Reckhow, DA, PL Rees, G Makdissy, “Management of Water Supplies for Control of Disinfection Byproduct Precursors,” oral presentation at the conference, *Safe Drinking Water: Where Science Meets Policy*, March 16-17, 2006, Chapel Hill, NC.

Reckhow, DA, J Kim, “Role of Lignin and Protein Residues in NOM on its Reactions with Chlorine”, oral presentation, NU Annual Conference, *Humic Science and Technology IX*, March 22-24, 2006, Boston, MA.

Reckhow, DA, Rees, PL, Long, SC, Ganesan, D, and Hanson, A., “The Blackstone River EFF and its Accompanying Cyberinfrastructure,” oral presentation at the ASCE EWRI national meeting, Omaha, NE, May 25, 2006

Reckhow, DA, “Beware the Quick Fix: Consider all the Angles,” oral presentation at the New England Waterworks Association Water Quality Symposium, May 18, 2006, Boxboro, MA.

Hua, G, and DA Reckhow, “Comparison of total organic halogen formation from chlorine and alternative disinfectants” oral presentation at the AWWA Annual Conference, June 12, 2006, San Antonio, TX

Kim, J., Makdissy, G and DA Reckhow, “The Role of Lignin in the Formation of Disinfection By-Products,” poster presentation at the Gordon Research Conference on DBPs, August 15, 2006, South Hadley, MA.

Boning Liu, David A. Reckhow, John E. Tobiason, Douglas Borgatti, Ralph J. Tarnauskas, Dana Hachigian, Michael Downey, and Peter C. Karalekas “Beavers and DBP Precursors in SWSC West Parish Raw Water Sources”, presentation at the NEWWA Annual Conference, Sept 19, 2006.

Hua, G, and DA Reckhow, "Hydrophobicity and molecular size distribution of unknown halogenated disinfection byproducts in drinking water" oral presentation at the Water Quality Technology Conference, , November 6, 2006, Denver, CO

Rego, C.A., Reckhow, D.A., Kim, J., Makdissy, G., Mentzen, H. and Tassi, P. "Understanding the Relationship between Organic Precursor Fractions and Formation of NDMA and CNX in a Groundwater Supply" oral presentation at the Water Quality Technology Conference, , November 6, 2006, Denver, CO

Kashinkunti, R., Metz, D., DeMarco, J., Awad, J., Linden, K., Reckhow, D.A. and Malley, J.P. "UV/Chlorine: Looking beyond conventional DBPs", oral presentation at the Water Quality Technology Conference, , November 6, 2006, Denver, CO

Reckhow D.A., "Pharmaceuticals and Endocrine Disrupters in Massachusetts Waters" oral presentation at the Massachusetts Waterworks Association, Annual Meeting, Sturbridge, MA, January 25, 2007

Bull, R.J., Reckhow, D.A., "Use of chemical models and structure-activity relationships to identify novel disinfection by-products of potential toxicological concern," oral presentation at the American Chemical Society National Meeting, Chicago, IL March 25-29, 2007

Hua, G., Reckhow, D.A., "Relationship between Brominated THMs, HAAs and Total Organic Bromine during Drinking Water Chlorination," oral presentation at the American Chemical Society National Meeting, Chicago, IL March 25-29, 2007

Reckhow, D.A., Makdissy, G., Rees, P.S. "Disinfection Byproduct Precursor Content of Natural Organic Matter Extracts," oral presentation at the American Chemical Society National Meeting, Chicago, IL March 25-29, 2007

Reckhow, DA, "Overview of Natural Organic Matter in Drinking Water", oral presentation, NU Annual Conference, *Humic Science and Technology X*, March 21-23, 2007, Boston, MA.

Reckhow D.A., Croue, J-P. "Natural Organic Matter and Precursors", invited presentation, AWWARF/CIRSEE Special Meeting on: Emerging Problems: Organic Byproducts of Potential Health Concern Produced During Drinking Water Treatment, Le Pecq, France, March 5-9, 2007.

Anastas, N. and Reckhow, D.A., "Investigating Treatment Effects on Targeted Endocrine Disrupting Compounds and Pharmaceuticals in Drinking Water", NEIWPCC conference on Pharmaceuticals in Water, Portland ME, August 9-10, 2007

Castellon, C., Fiedler, E., Reckhow, DA and Rees PL., "Sources, Characterization, Transformation and Transport of DBP Precursors in Wachusett Reservoir Watersheds", oral presentation, 2007 Watershed Science and Technical Conference, West Point, NY, September 11, 2007.

Reckhow, D.A., and Croue J-P., "Understanding Natural Organic Matter, A precursor of DBPs", oral presentation, AWWA Water Quality Technology Conference, Charlotte, NC, November 4, 2007

Reckhow, D.A., "Use of ozone (with and without accelerated decomposition) to destroy chlorine and chloramine reactive centers in NOM", oral presentation, AWWA Water Quality Technology Conference, Charlotte, NC, November 4, 2007

Ho, C. Wong, K., and Reckhow, D. A. (2008), "An Evaluation of the Methodology in Analyzing Compost for Erosion Control," Proc. Trans. Res. Brd. 87th Annual Meeting, 1/13-17/2008 (CD-ROM format), Trans. Res. Brd

Reckhow, D.A., "The Challenge of Nitrogenous Disinfection Byproducts," oral presentation at the Independent Testing Laboratory Association Annual Meeting, March 19, 2008, Worcester, MA.

Reckhow, D.A., “Disinfection Byproduct Precursor Content in Raw Waters across North America,” oral presentation, NU Annual Conference, *Humic Science and Technology XI*, April 2-4, 2008, Boston, MA

Reckhow, D.A., “Proteins as Important Reactive Compounds in Drinking Water Treatment,” oral presentation, MA Water Resources Research Center Conference, Amherst, MA, April 8, 2008

Reckhow, D.A., “Formation and Occurrence of Nitrogenous Disinfection Byproducts”, New York State AWWA Conference, April 22-24, 2008, Saratoga Springs, NY.

Reckhow, D.A., “Watershed Sources of Disinfection Byproduct Precursors,” oral presentation at the Croucher Foundation Advanced Study Institute; special symposium on Sustainability of Water Environment and Water Resources, June 23-25, 2008, Hong Kong

Reckhow, D.A. and Kim, J., “Lignin and Disinfection Byproducts,” oral presentation at the UCOWR/NIWR Annual Conference, July 22-24, 2008, Durham NC.

Reckhow, D.A. and Kim, J., “Role of Proteins and Amino Acids in DBP Formation,” oral presentation at the IWA Specialist Conference on NOM: from Source to Tap, September 2-4, 2008, Bath UK.

Reckhow, D.A., “Disinfection Byproduct Formation from NOM and Some Key Biochemicals”, oral presentation at the German Water Chemical Society Special Workshop, September 29-October 1, 2008, Maurach, Germany.

Reckhow, D.A. “Can Treatment and Occurrence Research Keep up with the CCL Process?; The Case of DBPs and PPCPs”, presentation at the VA section AWWA meeting, October 20, 2008, Richmond, VA

Reckhow, DA “Nitrogenous Compounds and Disinfection Byproduct Formation” UNC Symposium on “Sustainable and Safe Drinking Water in Developing & Developed Countries”, Chapel Hill, NC, November 6, 2008.

Bridges, M., DA Reckhow, B. Liu, J. Williams and J. Cotruvo, “Analysis and Comparison of Disinfection Byproducts from Brominated Hydantoinylated Cross-Linked Polystyrene to Traditional Chlorination, “WEF Disinfection 2009 Conference, March 2, 2009, Atlanta GA.

Reckhow DA and K Arcaro, “Pharmaceuticals, Personal Care Products and Endocrine Disrupting Compounds in Drinking Waters,” invited oral presentation, NEWWA Lab Symposium., Holliston MA, March 5, 2009

Reckhow DA, “Formation and Occurrence of Nitrogenous Disinfection Byproducts,” Humic Substances Symposium XII, invited oral presentation, Boston, March 18, 2009.

Studer KE, and DA Reckhow, “Comparison of Automated and Manual Methods for Solid Phase Extraction of Endocrine Disrupting Chemicals, “oral presentation, MA WRRC Annual Conference, Amherst, MA April 7, 2009.

Reckhow DA and K Arcaro, “Pharmaceuticals, Personal Care Products and Endocrine Disrupting Compounds in Drinking Waters,” invited oral presentation, EPA NERL Symposium., Chelmsford MA, May 13, 2009

Studer KE, and DA Reckhow, “Comparison of Automated and Manual Methods for Solid Phase Extraction of Endocrine Disrupting Chemicals, “oral presentation at the AWWA Annual Conference, June 14-18, 2009, San Diego, CA.

Schindler, S., S. Freud, C. Glaser, F. Mak, W. Becker, J. Herzner, E. Feldman, K. Hoek, B. Rosenfeldt, DA Reckhow, and R. Sharp, “Optimizing for DBP Control: The New York City Experience” oral presentation at the AWWA Annual Conference, June 14-18, 2009, San Diego, CA

Herzner, J., W. Becker, K. Hoek, DA Reckhow, S. Schindler, F. Mak, S. Freud, J. Weiss, G. Kroll, “DBP Control for New York City: Precursor Characterization and Reservoir System Optimization” oral presentation at the AWWA Annual Conference, June 14-18, 2009, San Diego, CA

Hua, G, and DA Reckhow, “Effect of Alkaline pH on the Stability of Halogenated DBPs” oral presentation at the AWWA Annual Conference, June 14-18, 2009, San Diego, CA

Reckhow, DA, “Discovery of New and Emerging DBPs of Health Concern”, invited oral presentation at the Gordon Research Conference in Disinfection Byproducts, August 10, 2009.

Reckhow DA and K Arcaro, “Occurrence and Treatment of EDCs and PPCPs in New England Waters,” invited oral presentation, Tiff Symposium, NYS AWWA., September 30, 2009

Reckhow DA and K Arcaro, “Occurrence and Treatment of EDCs and PPCPs in New England Waters,” invited oral presentation, MI Water Environment Federation Meeting, Lansing MI., October 15, 2009

Weiss, W.J, Schindler, S., Becker, W., Herzner, J. and Reckhow DA, “Lowering NOM and DBP Levels by Optimizing Source Water Supply, oral presentation at the AWWA Water Quality Technology Conference, November 18, 2009.

Reckhow, DA and Liu B., “Temporal Variability of Disinfection Byproducts in a Massachusetts Drinking Water System”, oral presentation at the 13th Humic Substances Symposium, Northeastern University, March 19, 2010.

Reckhow, DA, “Pharmaceuticals and Personal Care Products/Endocrine Disrupting Compounds” invited oral presentation at the New York City Water Summit, Columbia University, October 9, 2010.

Keyes, AP, and Reckhow DA, “Modeling DBPs in the NYC System with Free Chlorine or Chloramines as Residual Disinfectants” oral presentation at the NYS AWWA conference, Saratoga Springs, NY, April 21, 2010.

Reckhow, DA and Liu, B “Temporal and Spatial Variability of Regulated and Non-regulated DBPs in a Massachusetts Drinking Water System” oral presentation at the AWWA Annual Conference, Chicago, IL, June 22, 2010

Reckhow, DA, Keyes, AP, Herzner, J., Hoek, K., Becker, W., Freud, S., Schindler, S. “Modeling DBPs in the New York City System with Free Chlorine or Chloramines as Residual Disinfectants”, oral presentation at the AWWA Annual Conference, Chicago, IL, June 23, 2010

Reckhow, DA, Keyes, AP, Herzner, J., Hoek, K., Becker, W., Freud, S., Schindler, S. “Long-term Precursor Changes in an Upland Reservoir” invited oral presentation at The Sixth International Conference on Sustainable Water Environment, University of Delaware; July 29, 2010.

Liu, B., and Reckhow, DA, “Temporal and Spatial Variability of Disinfection byproducts in a Massachusetts Drinking Water System”, oral presentation at the ACS Summer Meeting, Boston, MA, August 23, 2010.

Reckhow, D.A., “Effects of UV Treatment on Disinfection By-Products”. Walkerton Clean Water Center Special Symposium, Ontario, Canada, 9 Nov 2010

Reckhow, D.A. “Disinfection Byproducts and Public Health”, Special Symposium in Honor of Philip C. Singer, 14 April 2011.

Park, M.; Reckhow, DA; Stanford, B.; Rosenfeldt, EJ; Mofidi, A.; Lavine, M.; Becker, W.; and Lipsky, D., “Benchmarking and Monitoring Strategies for EDCs/PPCPs by Drinking Water Utilities,” oral presentation by Park and Reckhow at the AWWA Annual Conference, Washington DC, June 15, 2011

Stanford, B., Dryer D., Rosenfeldt, EJ; Lavine, M.; Park, MH; Becker, W.; and Reckhow, D., “Benchmarking EDC and Pharmaceutical Contamination: Meta-Analysis of Historical Data Using Risk-Based Guidelines,” oral presentation by Stanford at the AWWA Annual Conference, Washington DC, June 15, 2011

Hua, G. and Reckhow DA, “Effect of Pre-ozonation on the Formation and Speciation of DBPs”, oral presentation by Hua at the AWWA Annual Conference, Washington DC, June 16, 2011

Fichter, A, R. Collins and D.A. Reckhow, “Assessing Selected PPCP Removals from Various Enhanced Biofiltration Schemes”, oral presentation by A Fichter, AWWA Water Quality Technology Conference, Phoenix, AZ, Nov 2011

Reckhow, D.A. AEEESP lecture, “Engineering Approaches for Reducing Exposure to Harmful DBPs”, oral presentation, June 11, 2012, AWWA Annual Conference, Dallas, TX

Reckhow, D.A., J.E. Tobiason, J. Goodwill, Y.Jiang, “Use of Ferrate in Small Drinking Water Treatment Systems”, 10th IWA Leading Edge Conference on Water and Wastewater Technologies, June 5, 2013, Bordeaux, France.

Goodwill, J., D.A. Reckhow, J.E. Tobiason, Y. Jiang, “Bench-Scale Assessment of Ferrate Pre-oxidation” oral presentations, AWWA Annual Conference, June 13, 2013, Denver, CO

Hua, G., D.A. Reckhow, R. Lama, “Relationship between NOM Properties and DBP Formation” oral presentations, AWWA Annual Conference, June 11, 2013, Denver, CO

Bazilio, A., C. Park, D.A. Reckhow, “Biodegradation of Disinfection Byproducts in Drinking Water Distribution Systems,” oral presentation, AWWA Annual Conference, June 11, 2013, Denver, CO

Reckhow, D.A., R. Zhao, P. Wittbold, W. Becker, B. Stanford, B. Wright, “Alternative Methods for Assessing DBP Precursors in NOM,” IWA meeting, NOM 5, Oct 3, 2013; Perth, Australia

Reckhow, D.A., C. Wu, C. Park, W. Mitch, J. Skadsen, Fate of Non-Regulated Disinfection Byproducts in Distribution systems, WQTC, AWWA, Nov, 2013, Long Beach, CA

Reckhow, D.A. “Disinfection Byproduct Fundamentals,” SC AWWA meeting, Greenville SC, January 31, 2014.

Reckhow, D.A. “Controlling Consumer Exposure to Regulated and Unregulated DBPs,” SC AWWA meeting, Greenville SC, January 31, 2014.

Reckhow, D.A., “Degradation of DBPs in Distribution Systems”, VA AWWA meeting, Richmond, VA, March 25, 2014

Goodwill, J., Y. Jiang, J.E. Tobiason and D.A. Reckhow, “Pilot Scale Assessment of Ferrate Preoxidation”, presentation at the AWWA Annual Conference and Exposition, Boston, MA, June 10, 2014.

Jiang, Y., J. Goodwill, D.A. Reckhow and J.E. Tobiason, “Ferrate Decomposition in Natural Waters and Impacts on Natural Organic Matter and Disinfection Byproduct Precursors”, presentation at the AWWA Annual Conference and Exposition, Boston, MA, June 11, 2014.

Reckhow, D.A., “The Present Status of Regulated and Non-regulated DBPs”, keynote address at the TIFFT Symposium, Sept 17, 2014

Reckhow, D.A., Y. Jiang, J. Goodwill and J.E. Tobiason “Impacts of Ferrate Treatment on DBP Formation,” , presented at the international conference on disinfection byproducts in water, DBP 2014, Mulheim Germany, October 28, 2014

Alkattan, M., K. Ikuma, J. Goodwill, J.E. Tobiason and D.A. Reckhow, "Can Ferrate be Used to Remove X-ray Contrast Media from Drinking Water?", poster presentation at the NEWWA Water Quality Symposium, Milford, MA, May 13, 2015.

Reckhow, D.A., "Chloramination: Ask your Doctor if it's right for you", oral presentation at the NEWWA Water Quality Symposium, May 13, 2015

Reckhow, D.A., "Water Innovation Network for Sustainable Small Systems", oral presentation at the Res'Eau Annual Meeting, Kelowna, BC., May 27, 2015.

Reckhow, D.A., J.E. Tobiason, J. Goodwill and Y. Jiang, "Use of Ferrate in Small Drinking Water Treatment Systems", oral presentation at the Res'Eau Annual Meeting, Kelowna, BC., May 27, 2015.

Reckhow, D.A., "U.S. EPA STAR National Centers for Innovation in Small Drinking Water Systems", oral presentation at the AWWA ACE, Anaheim, CA, June 10, 2015

Reckhow, D.A., Yanjun Jiang, Xian Ma, Julie Bliss, Jun Gao, Joe Goodwill and John E. Tobiason, "Comparison of Ozone and Ferrate for Oxidation of Disinfection Byproduct Precursors", World Ozone Congress, Barcelona, June 29, 2015

Reckhow, D.A., "Analysis of Organic Iodine in Drinking Water", oral presentation at the National Environmental Monitoring Conference, Chicago, July 18, 2015

Reckhow, D.A., and Sayess, R., "Organically-bound Iodine in Raw and Treated Drinking Water", IWA NOM6 International Conference, Malmo, Sweden, September, 7, 2015

Jiang Y, Goodwill JE, Tobiason JE, Reckhow DA., "Comparison of the effects of ferrate and ozone pre-oxidation on disinfection byproduct formation," oral presentation at the International Chemical Congress of Pacific Basin Societies (PacifiChem), December 16, 2015, Honolulu, HI.

Reckhow, D.A., "WINSSS, A National Center of Innovation for Small US Drinking Water Systems," invited oral presentation at the Water Research Australia meeting, February 17, 2016, Sydney, Australia.

Reckhow, D.A., S. Wilson and B. Dvorak, "The WINSSS Experience in Understanding Barriers to Acceptance of New Technologies," oral presentation at the AWWA Sustainable Water Management Conference, March 8, 2016, Providence, RI.

Reckhow, D.A., "Controlling Health Risks from Chemicals in Drinking Water," invited oral presentation at the Clarkson Water Forum, Pottsdam, NY, May 19, 2016.

Yu, Y., and D.A. Reckhow, "Kinetic Formation Profiles of Nitrogenous and Carbonaceous Drinking Water Disinfection Byproducts from Chlorination of Free and Combined Aspartic Acid," oral presentation at the AWWA ACE, Chicago, June 20-22, 2016.

Wilson, S.; Dvorak, B.; Seidel, C.; Taft, J.; Osethouldt, D.; Morris, L. and D.A. Reckhow, "Understanding State Acceptance of New Small Systems Drinking Water Technologies," oral presentation at the AWWA ACE, Chicago, June 20-22, 2016.

Ziv-El, M.; Howley, E.; Speitel, G.; Reckhow, D.A.; Brown, J.; Kirisits, M.J., "Case Study: Ammonia and Trace Contaminant Removal in Bench- and Pilot-Scale Biofilters," oral presentation at the AWWA ACE, Chicago, June 20-22, 2016.

Reckhow, D.A.; Y. Jiang; J. E. Goodwill; J. C. Cunningham; X. D. Mai; and J. E. Tobiason, "Incorporating Ferrate Oxidation into Small Drinking Water Systems, oral presentation at the IWA Small Systems Symposium, Athens, September 14-16, 2016.

Mohan, A. and D.A. Reckhow, "Occurrence, formation and persistence of halobenzoquinones: A case study on 2, 6-dichloro-1, 4 -benzoquinone" oral presentation at the WQTC, AWWA, Indianapolis, IN, November 13-16, 2016.

Reckhow, D.A., Jiang, Y., Cunningham, J., Goodwill, J., Mai, X. and J.E. Tobiason, "Use of ferrate for oxidation of organic substances in water", oral presentation at the WQTC, AWWA, Indianapolis, IN, November 13-16, 2016.

Reckhow, D.A. Ma, X., Mullen, J.B., and J. Gao, "Relative Effectiveness of Ferrate, Chlorine Dioxide, Ozone and Peroxone for Control of Disinfection Byproduct Precursors" invited oral presentation at the ACS National Meeting, San Francisco, CA, April 2-6, 2017.

Reckhow, D.A. and Y. Yu, "Toxicity Profiles and Metastable Disinfection Byproducts", invited oral presentation at the ACS National Meeting, San Francisco, CA, April 2-6, 2017.

Tobiason, J.E., Reckhow, D.A., Goodwill, J., Jiang, Y., Cunningham, J., and X. Mai, "Oxidation Processes, Nanoparticles & Membranes in Water & Wastewater", invited oral presentation at the ACS National Meeting, San Francisco, CA, April 2-6, 2017.

Reckhow, D.A., Jiang, Y., Cunningham, J., Goodwill, J., Mai, X. and J.E. Tobiason, "Integrating Ferrate into US Water Treatment Practice", oral presentation at the CA-NV Section Meeting, AWWA, Anaheim, CA, April 11-13, 2017.

Reckhow, D.A., Jiang, Y., Cunningham, J., Goodwill, J., Mai, X. and J.E. Tobiason, "Integrating Ferrate into US Water Treatment Practice", on-line oral presentation via the California Baywork Webinar, April 25, 2017.

Jeznach, L.C., Mohan, A., Tobiason, J.E. and D. A. Reckhow, "Modeling the impacts of hypothetical oil spills on freshwater drinking sources", poster presentation at the AWWA ACE, Philadelphia, PA, June 12-15, 2017

Eyring, A., Sayess, R. and D.A. Reckhow, "Trends During Multi-Year Unregulated DBP Study" oral presentation at the AWWA ACE, Philadelphia, PA, June 12-15, 2017

Mohan, A. and D.A. Reckhow, "DBP formation from dissolved crude oil hydrocarbons", poster presentation at the Gordon Research Conference on Disinfection Byproducts, August 1, 2017

Reckhow, D.A., "The Future Role of Public Universities in Helping to Address State Drinking Water Priorities" oral presentation at the 14th Annual EPA Drinking Water Workshop, Small Systems Challenges and Solutions, Cincinnati, OH, August 24, 2017

POST-DOCTORAL STUDENTS DIRECTED

Dr. Jean-Philippe Croue:	1987-1988
Dr. Alain Jadas-Hecard:	1989-1990
Dr. Yuefeng Xie:	1989-1994
Dr. Yun Pan	1992
Dr. Benedicte Mousset:	1998-1999
Dr. Angela Gonzalez:	1999-2001
Dr. Junsung Kim	2003-2007
Dr. Gladys Makdissy	2004-2006
Dr. Kaoru Ikuma	2014-2015
Dr. Celina Dozier	2016-

CHAired DOCTORAL DISSERTATIONS AND MASTERS THESES

Wacks, M.J., "The Formation and Decomposition of Halogenated Organics During Chlorination of a Drinking Water," MS Thesis, February, 1987.

Parks, C.A., "Joint Action of Toxicant Mixtures on Daphnids," MS Thesis, February, 1989.

Hull, C.S., "Removal of DOX and DOX Precursors in Municipal Wastewater Treatment Plants," MS Thesis, September, 1989.

Lehan, E.R., "Low-level Preozonation and Organohalide Formation in Municipal Wastewater Effluents," MS Thesis, September, 1989.

Coombs, K.K., "Development of a Rapid Trihalomethane Formation Potential Test," MS Thesis, May, 1990.

Baldwin, G.G., "The Effect of Iron on Ozone-Induced Particle Destabilization," MS Thesis, September, 1991.

Pierce, P.D., "Development of a Rapid Spectrophotometric Method for Measuring Trihalomethanes in Finished Drinking Water," MS Thesis, February, 1992.

Rajan, R.V., "Characterization and Fate of Halogenated Organic Compounds in a Biologically Treated Secondary Fiber Mill Wastewater," Ph.D. Dissertation, September, 1992.

McKnight, A. "Reactions of Ozonation Byproducts with Chlorine and Chloramines," MS Thesis, September, 1992.

Zhou, X. "Formation and Removal of Aldehydes in Drinking Water Treatment Processes," MS Thesis, February, 1993.

Hesse, E. "The Influence of Natural Organic Matter on the Enhanced Coagulating Effects of Ozone," MS Thesis, May, 1993

Zhu, Q. "Evaluation of Selected Treatment Alternatives in Controlling Haloacetic Acid Formation," MS Thesis, May, 1993

Bose, P. "Selected Physico-chemical Properties of Natural Organic Matter and Their Changes Due to Ozone Treatment: Implications for Coagulation using Alum," PhD Dissertation, September, 1994.

Bodendorf, J.D. "An Assessment of the Destruction of THM Precursors by Ozone," MS Report, September, 1994.

Springborg, D.C. "Effects of Ozone and Biologically Active GAC on Haloacetic Acid Formation," MS Thesis, September, 1994.

MacNeill, A.L. "Mechanistic Modeling of Trihalomethanes and Other Neutral Chlorination By-Products," MS Thesis, September 1994.

Byrnes, P.D. "Impact of Oxidant Exposure on the AOC Values of a Model Water," MS Thesis, February, 1995.

Weiner, J.M. "Effects of Ozone on Trihalomethane Formation: Pilot Plant Processes and Kinetics," MS Thesis, February, 1995.

Pines, D.S. "Evaluation of a Drinking Water Oxidation Process that Uses a Titanium Dioxide Catalyst and ozone," MS Thesis, May, 1995

Humayun, R. "Assessment of a Catalytic Ozonation Process for the Treatment of a Colored Groundwater," MS Thesis, September, 1995.

McClellan, J. "Removal of Haloacetic Acid and Trihalomethane Precursors by Direct Filtration with Post Ozone and Biologically Active GAC," MS Thesis, February 1996.

Wolfram, E. "Determination of the Decay Rate for Indicator Bacteria Introduced by Sea Gulls to an Oligotrophic Drinking Water Reservoir," MS Thesis, May 1996.

Bezbarua, B. "Modeling Reactions of Ozone with Natural Organic Matter," PhD Dissertation, May 1997.

Mehmandoust, F. "Catalytic Water Conditions 'Hydrocat'", MS Thesis, May 1998.

Cheek, K. "Water Velocities and Dispersion in the Winsor Dam Basin of the Quabbin Reservoir", MS Thesis, May 1998.

Hodgkins, L. "Measurement and Characterization of Biodegradable Dissolved Organic Carbon in MWRA's Drinking Water Supply and Distribution System," MS Thesis, February 1999.

Pierkarski, A. "An On-line Semi-Continuous Recirculating BDOC Reactor for Drinking Water", MS Thesis, September 1999.

Pines, D.S., "Metal-Ozone Catalytic Systems for Water Treatment", PhD. Dissertation, May 2000.

McClellan, J. "Modeling Chlorine Decay and Chlorination By-Product Formation in Water Treatment and Distribution", PhD Dissertation, September 2000.

Addison, M.A., "Impacts of Water Source, Water Treatment and Chlorination Conditions on Haloacetic Acid Formation," MS Thesis, May 2001

Hartmann, C.M. "Identification and Fate of Mixed Ozonation/Chlorination and Ozonation/Chloramination By-products in Drinking Water Treatment," PhD Dissertation, May 2002

Malfronte, J. "Disinfection Byproduct Models for the Stamford, CT Water System" MS Thesis, February 2003.

Corbin, M.J., "The Effects of Chlorine Addition to Filters on Disinfection Byproducts," MS Thesis, September 2003.

Venkatesan, N., "Bench Scale Study of the Impact of UV, Chlorine and Chloramines on DBP Formation in Drinking Water," MS Thesis, May 2004.

Bryan, D.P. "Investigation of Disinfection Byproduct Precursors in the Wachusett Reservoir Watershed", MS Thesis, February 2005.

Carlson, B. "Performance Evaluation of Appropriate In-home Drinking Water Treatment Options for Developing Countries," MS Thesis, September 2006

Brown M., "The Relationship Between Pre-Filter Chlorine Addition and Enhanced Disinfection Byproduct Formation," MS Thesis, September 2006

Hua, G., "Characterization of Total Organic Halogen Produced by Chlorine, Chloramines, and Chlorine Dioxide," PhD Dissertation, September 2006.

Liu, B. "Beavers and DBP Precursors in SWSC West Parish Raw Water Sources," MS Thesis, January 2007

Castellon, Cynthia. "Disinfection Byproduct (DBP) Precursors in a Central MA Watershed and DBP Occurrence in MA Water Supplies", MS Thesis, July 2008.

Keyes, Amanda P., “Disinfection Byproducts (DBPs) and DBP Precursors in the New York City Water System”, MS Thesis, August 2010.

Lin, Jing, “Conventional Water Treatment Processes for Removing Pharmaceutical and Endocrine Disrupting Compounds”, MS Thesis, May 2011

Studer, Kirsten E., “Investigating Estrogenic Endocrine Disrupting Compounds and their Disinfection Byproducts within Drinking Water Treatment, MS Thesis, August 2011.

Srinivasan, Varun, “Developing a Watershed-Level Protocol for Choosing Indicators for EDCs/PPCPs Using Analytical Methods and Chemometrics”, MS Thesis, August 2013

Wu, Chen, “Non-Regulated Disinfection By-Products Formation and Degradation Study in Ten Water Distribution Systems in US”, MS Thesis, August 2013

Liu, Boning, “Impact of Water Heating on Disinfection Byproduct Concentrations”, PhD Dissertation, May 2014

Wittbold, Patrick, “Advanced techniques for Monitoring Changes in Natural Organic Matter Using the Polarity Rapid Assessment Method (PRAM)”, MS Thesis, September 2014

Kim, Soon-Mi, “Removal of Pharmaceuticals and Personal Care Products by Drip Disposal Onsite Septic Systems”, MS Thesis, December 2014

Dutra, Megan, “Effects of Disinfectants on the Formation of Aldehydes,” MS Thesis, September 2015.

Shakib, Iman Hosseini, “Biogenic Organic Carbon Compounds in Air and Rain,” MS Thesis, March 2016.

Jiang, Yanjun, “The Stability of Ferrate (VI) in Water and its Impacts on Disinfection Byproduct Precursors,” PhD Dissertation, September, 2016

Gao, Jun, “The Impact of Advanced Oxidation Processes on DBP Formation in Drinking Water”, MS Thesis, September 2016.

Yu, Yun, “The Fate of Haloacetonitriles in Drinking Water,” PhD Dissertation, September 2016.

DISSERTATIONS AND THESES: COMMITTEE/JURY MEMBER

University of Massachusetts (Amherst):

Civil & Environmental Engineering: about 75 MS and PhD students

Mechanical & Industrial Engineering: Freiman

Chemistry: Hanna, Seeley, Slowicki, Sundin, Ellis, Lavoy, Scott, Houle, Mentzen; Li, Kearns

Biostatistics & Epidemiology: Ramsay, Silverman

Plant & Soil Science: Winkler, Gunasekara, Johnson, Kramer

Geosciences: Naughton

Harvard University: Masten

University of Waterloo (Ontario): Urfer

University of Alberta: Andrews

École Polytechnique de Montréal: Zoungrana, Barbeau, Zamyadi, Stoquart

University of South Australia: Kostakis

Université de Poitiers (France): Labouyrie-Rouillier, LeRoux

Université d’Angiers (France): Kergaravat

Curtin University (Australia) How

FUNDED SPONSORED RESEARCH

"The Chemical Decomposition of Halogenated Organic Compounds in Drinking Water" (David A. Reckhow, PI) University of Massachusetts Graduate Research Council, 1/1/86-12/31/86, \$5,000.

"Halogenated Non-Volatile Organic Discharges from Industrial and Municipal Wastewater Effluents" (David A. Reckhow, PI; David W. Ostendorf, Co-PI) Massachusetts Division of Water Pollution Control, 9/1/86-8/31/89, \$138,726.

"Low level Ozonation to Control Discharges of Organic Chlorine Compounds from Municipal Wastewater Treatment Plants" (David A. Reckhow, PI) Massachusetts Division of Water Pollution Control, 9/1/86-8/31/89, \$98,576.

"Validation of the Test Procedure: The Rapid Haloform Index" (David A. Reckhow, PI; James K. Edzwald, Co-PI) American Water Works Association Research Foundation, 1/1/87-6/30/88, \$65,815.

"Evaluation of the Dohrmann Rapid Haloform Test" (David A. Reckhow, PI) Dohrmann Division of Rosemont Corporation, 1/1/87-12/31/88, \$27,000.

"Hewlett-Packard Corporation Grant: Gas Chromatograph/Mass Spectrometer" (David A. Reckhow, PI) Hewlett-Packard Corp., 8/18/88, \$128,445.

"Transformations of Natural Organic Material During Preozonation" (David A. Reckhow, PI) Formal proposal for a Cooperative Agreement, Environmental Protection Agency, 9/1/88- 8/31/90, \$212,000.

"A Simple Spectrophotometric Method for the Determination of THMs in Drinking Water" (David A. Reckhow, PI) American Water Works Association Research Foundation, 9/1/88-3/31/90, \$65,613.

"Use of Ozone as an Aid to Coagulation/Filtration" (David A. Reckhow, James K. Edzwald, John E. Tobiason, PIs) American Water Works Association Research Foundation, 9/1/88-2/28/91, \$200,595.

"Nucleophilic Decomposition of Disinfection Byproducts" (David A. Reckhow, PI) National Science Foundation, 2/1/89-1/31/91, \$154,198.

"Presidential Young Investigator Award" (David A. Reckhow, PI) National Science Foundation, 9/1/89-8/31/94, \$500,000.

"Decomposition of Taste and Odor Compounds with Sulfite" (David A. Reckhow, PI) Compagnie Generale des Eaux, and Le Syndicat des Eaux de l'Ile de France, 1/1/90-12/31/90, \$25,000.

"Effects of Oxidation on Organic Carbon and Disinfection By-Products" (John E. Tobiason, David A. Reckhow, Michael S. Switzenbaum, PIs) South Central Connecticut Regional Water Authority, 1/1/90-12/31/90, \$78,467.

"Drinking Water Research Studies for Boston's Pilot Treatment Program" (James K. Edzwald, David A. Reckhow, PIs) CH2M Hill Consulting Engineers, 9/1/90-12/31/91. \$150,015.

"Investigation of Pre-Ozonation and Biologically Active Filtration" (John E. Tobiason, Michael S. Switzenbaum, David A. Reckhow, PIs), South Central Connecticut Regional Water Authority, 1/1/91-12/31/91, \$98,172.

"Investigation of Ozonation, Dissolved Air Flotation and Biologically Active Filtration", (John E. Tobiason, James K. Edzwald, Michael S. Switzenbaum, David A. Reckhow, PIs) South Central Connecticut Regional Water Authority, 1/92-12/92, \$129,300.

"Evaluation of Alternative Oxidation Processes at the Passaic Valley Water Commission Pilot Treatment Facility", (John E. Tobiason and David A. Reckhow, PIs), Passaic Valley Water Commission, 1/92 - 12/93, \$181,380

"Placement of Ozonation and Granular Activated Carbon for Improved Water Treatment", (John E. Tobiason, Michael S. Switzenbaum, David A. Reckhow, PIs), South Central Connecticut Regional Water Authority, 1/93-12/93, \$105,000

"The Use of Ozone and Titanium Dioxide for the Removal of Hydrophobic Organics," (David A. Reckhow, PI) Irvine Ranch Water District, Irvine, CA, 7/01/93-6/30/94. \$44,969.

"Contaminant Transport Modeling and Impact of Watershed Management Activities on Water Quality in Quabbin Reservoir" (James W. Male, James K. Edzwald, David A. Reckhow, and John E. Tobiason, PIs) Metropolitan District Commission, Boston, MA 1/1/94-6/30/95, \$32,285; 7/1/96-6/30/97, \$119,147; 3/1/96-9/31/97, \$178,261.

"Assessment of Filtration Performance, Ozonation and Post-Filtration GAC" (John E. Tobiason, David A. Reckhow and James K. Edzwald, PIs) South Central Connecticut Regional Water Authority, 1/1/95-3/31/96, \$115,000.

"Catalytic Ozonation for Low-Strength Aqueous Streams" (David A. Reckhow, PI) National Environmental Technology for Waste Prevention Institute (NETI) 10/1/94-5/30/95, \$50,342.

"Evaluation of an Electrochemical Water Treatment System," (David A. Reckhow, PI) Massachusetts Executive Office of Environmental Affairs 8/1/95-1/31/96, \$12,000.

"An Environmental Engineering Facility for Research on Chemically Enhanced Biodegradation," (David A. Reckhow PI; James K. Edzwald, Sarina J. Ergas, Sharon C. Long, James W. Male, David W. Ostendorf, Michael S. Switzenbaum, John E. Tobiason, CoPIs) National Science Foundation, 9/15/96-8/31/99, \$314,890.

"Investigation of Treatment Performance: Particle Removal and D/DBP Kinetics" (John E. Tobiason, David A. Reckhow and James K. Edzwald, PIs) South Central Connecticut Regional Water Authority, 1/1/96-12/31/96, \$116,557.

"Research for Drinking Water Treatment Optimization", (John E. Tobiason, David A. Reckhow and James K. Edzwald, PIs), South Central Connecticut Regional Water Authority, 1/97-12/97, \$121,000

"Analysis of Organic Byproducts from the use of Ozone, Ozone/Chlorine and Ozone/Chloramines in Drinking Water," (David A. Reckhow, PI; Thomas L. Potter, Co-PI) U.S. Environmental Protection Agency, 1/1/97-6/30/00, \$443,719.

"Development of LC Methods for Drinking Water" (David A. Reckhow) Waters Corporation, 8/1/97-indefinite, \$75,000

"Evaluation of Organic Matter in the MWRA Drinking Water Distribution System," (David A. Reckhow, PI; John E. Tobiason, James K. Edzwald, Co-PIs) Camp, Dresser & McKee, 2/12/97-11/30/98.

"Lake Gaillard Treatment Improvements and Distribution System Water Quality" (John E. Tobiason, David A. Reckhow and James K. Edzwald, PIs) South Central Connecticut Regional Water Authority, 1/1/98-3/31/99, \$74,447

"Contaminant Transport Modeling and Impact of Watershed Management Activities on Water Quality in Quabbin Reservoir" (James K. Edzwald, David A. Reckhow, and John E. Tobiason, PIs) Metropolitan District Commission, Boston, MA, 2/1/98-1/31/00, \$207,833.

"Development of a Kinetic Based Disinfection By-Products Model" (David A. Reckhow, PI, Zaid Chowdry, PI, Paul Westerhoff, PI, Gary Amy, PI) U.S. Environmental Protection Agency, 12/1/98-12/1/01, \$333,000

"Upgrading Direct Filtration Using Dissolved Air Flotation and Ozonation" (John E. Tobiason, David A. Reckhow and James K. Edzwald, PIs) South Central Connecticut Regional Water Authority, 1/1/99-3/31/00, \$128,159

"RWA Treatment Improvements: Lake Gaillard DAF and Lake Saltonstall Coagulation Optimization", (John E. Tobiason, James K. Edzwald, David A. Reckhow, PIs), South Central Connecticut Regional Water Authority, 1/00-03/01, \$99,994.

"Water Quality in MDC Reservoirs: 2001-2003, (David Ahlfeld, John Tobiason, Sharon Long, Paula Rees, and David Reckhow, PIs), Metropolitan District Commission, 7/1/2001 – 6/30/2003, \$458,103.

"Evaluation of Technologies for Zero Discharge in the Textile Industry," (Sarina J. Ergas and David A. Reckhow, Co-Pis) NETI, 7/1/99-6/30/00, \$80,000

"UV Disinfection of Wachusett Reservoir Water", (Robert Halsey, James P. Malley, David A. Reckhow, PIs) Black & Veatch Consulting Engineers and American Water Works Association Research Foundation, 12/1/2000-11/30/2002; \$47,189 UMass share

"UV Disinfection and Disinfection Byproduct Characteristics of Unfiltered Waters", (William Bellamy, Tom Pearson, James P. Malley, David A. Reckhow, John Marrino, Robert Grob, PIs) CH2M Hill Consulting Engineers and American Water Works Association Research Foundation, 12/1/2000-11/30/2002, \$517,905

"Chloramine Stability in the MWRA System" (David A. Reckhow, PI) Massachusetts Water Resources Authority and American Water Works Association Research Foundation, 12/1/2001-11/30/2002

"Monitoring Disinfection Byproducts in Drinking Water : Strategies for Small Utilities", MA WRRI, 4/1/2001-3/30/2003, \$99,598

"Characterization of TOX Produced During Disinfection Processes" (David A. Reckhow and Patrick Hatcher, PIs) American Water Works Association Research Foundation; project #2755, 11/1/2001-1/15/2006, \$489,231

"Zero Discharge in the Textile Industry: Phase II Scale-up and Implementation of Ozonation and Electrochemical Methods," (Sarina J. Ergas and David A. Reckhow, PIs) NETI, 1/1/2002-12/31/2002, \$90,000

"Distribution System Water Quality and Strategies for Control of NOM", (John E. Tobiason, David A. Reckhow, James K. Edzwald, PIs) Aquarion Company, 4/1/2002-3/31/2003, \$234,774

"Watershed Management and Drinking Water Supply Instrumentation (Sharon C. Long, John E. Tobiason, David A. Reckhow, et al.) NSF Major Research Instrumentation Grant, 1/1/2004-12/31/2006, \$715,000.

"Risk Based Prioritization of Disinfection Byproducts" (Richard Bull, David A. Reckhow), Am. Wat. Wrks. Assn. Research Foundation, project #2867, 10/1/2002-3/31/2005, \$197,971

"Watershed Sources and Long-term Variability of BDOC and NOM as Precursors" (David A. Reckhow, Paula L. Rees, Klaus Nuesslein) Am. Wat. Wrks. Assn. Research Foundation, 11/1/2002-10/31/2005, \$474,516

"Distribution System Water Quality Modeling and Strategies for Control of Natural Organic Matter and Disinfection By-Products", (John E. Tobiason, David A. Reckhow, PIs), Aquarion Water Company, 4/03- 3/06, \$755,100

"Plan for the Blackstone River EFF and the next Generation Cyberinfrastructure", (David A. Reckhow, Paula L. Rees, Sharon C. Long, James Kurose, Allen Hansen, Edward Riseman, Howard Schultz, Charles Schwiek, Leon Osterweil), National Science Foundation, 10/1/04-9/30/05, \$84,000.

"Real-Time Process Control Sensor for Measuring Arsenic Concentration in Water", (Julian Tyson, David A. Reckhow, David Hoagland), with Brims Ness Company, US Air Force SBIR, 10/1/04-9/30/05, \$60,000

“Evaluation of Compost for Erosion Control”, (Carlton Ho, David A. Reckhow), Massachusetts Highway Department, 11/1/04-5/1/07, \$172,132.

“Evaluation of NOM and DBP Precursors in SWSC West Parish Raw Water Sources”, (David A. Reckhow & John E. Tobiason) Springfield Water and Sewer Commission, 9/1/2004-12/31/2005, \$14,000

“Chloramination Feasibility Planning Study”, (David A. Reckhow & John E. Tobiason) 8/22/2006-8/21/2009, Hazen & Sawyer Engineering, City of New York, \$210,000

“Control of Manganese, Natural Organic Matter and Disinfection By-Products for Mystic, CT” (John E. Tobiason and David A. Reckhow, PIs) Aquarion Water Company of CT, 4/1/2006-9/31/2010. \$465,000

“Evaluation of Compost for Erosion Control,” (Carl Ho and David Reckhow, PIs), Massachusetts Highway Department, 6/28/2005-4/30/2008, \$173,133.

“Water Quality in MDC Reservoirs: 2006-2008, (David Ahlfeld, John Tobiason, Paula Rees, and David Reckhow, PIs), Metropolitan District Commission, 7/1/2006 – 6/30/2008, \$422,464.

“Establishing Guidelines for the Use of Ozone-GAC for Control of Endocrine Disruptors and Related Compounds in Water”, (David Reckhow, Kathleen Arcaro, PIs), MA Dept. of Environmental Protection, 6/1/2007-9/30/2007, \$20,000.

“Coagulation Optimization for the SWSC West Parish Filtration Plant”, (John E. Tobiason and David A. Reckhow, PIs), 09/07-01/09, Springfield Water and Sewer Commission, \$49,911

“Methods Development for Disinfection By-Products Associated with Cancer,” (Xing-Fang Li, Steve Hrudey, Richard J. Bull, David A. Reckhow, Andrew Humpage, Cynthia Joll, and Anna Heitz, PIs) American Water Works Association Research Foundation, 12/1/2007 – 11/30/2009, \$534,000.

“Water Quality in MDC Reservoirs: 2008-2010, (David Ahlfeld, John Tobiason, and David Reckhow, PIs), Metropolitan District Commission, 7/1/2008 – 6/30/2010, \$249,560.

“Establishing Guidelines for the Use of Ozone-GAC for Control of Endocrine Disruptors and Related Compounds in Water”, (David Reckhow, Kathleen Arcaro, PIs), Water Research Foundation & 15 utilities, 7/15/2008-12/30/2010, \$97,000.

“Fate of Non-regulated DBPs in Distribution Systems,” (David Reckhow, PI; Chul Park and William Mitch, Co-PIs) Water Research Foundation, 5/1/2010-10/31/2012, \$679,310.

“Water Quality in DCR Reservoirs 2011-2012”, (John Tobiason, David Ahlfeld, Mi-Hyun Park and David Reckhow, PIs), MA Department of Conservation and Recreation, Division of Water Supply Protection , 07/10-06/12, \$249,897.

“Manganese and DBP Control for AWC Mystic System and Mn Sequestration,” (John Tobiason, PI, Dave Reckhow, Co-PI) Aquarion Water Company of CT, 9/1/2010-8/31/2013, \$355,242.

“Impact of Environmental Estrogens on Epigenetics: Bisphenol A in Breast Milk and Promoter Methylation of Exfoliated Breast Epithelial Cells” (Kathleen Arcaro, PI; Douglas Anderton and David Reckhow, Co-PIs), Avon Foundation, 7/1/2010-6/30/2012, \$285,000.

“STEM Digital Images in Geoscience Investigations: Teaching Analysis with Light (STEM DIGITAL)”, (Mort Sternheim, PI, Stephen Schneider, Julian Tyson, David A. Reckhow, co-PIs), National Science Foundation, 9/15/10-8/31/13, \$967,619

“EDC/PPCP Benchmarking and Monitoring for Drinking Water Utilities”, (David Reckhow, PI; Mi-Hyun Park and Michael Lavine, Co-PIs), Water Research Foundation, 9/1/2010-12/1/2013, \$850,000.

“Use of Ferrate in Small Drinking Water Treatment Systems,” (David Reckhow, PI, John Tobiason, Co-PI) US EPA, 12/1/2011-11/30/2014, \$497,078.

“On-Line NOM Characterization: Advanced Techniques for Controlling DBPs and for Monitoring Changes in NOM Under Future Climate Change Scenarios,” (David Reckhow, PI) Water Research Foundation, Hazen & Sawyer, 9/1/2012-11/30/2013, \$166,128.

“Assistance with Development of a Plan for Chemical Treatment to Control Growth of Biofilm in the Catskill Aqueduct,” (David Reckhow, PI) Hazen & Sawyer, NY DEP, , 10/8/2012-10/7/2013, \$40,000.

“Climate Change and Water Quality - Impacts and adaptation strategies for NYS utilities,” (David Reckhow, PI), NYSERDA, Hazen & Sawyer, 1/1/2013-12/31/2014, \$79,942

“Assessment of Unregulated Disinfection Byproducts in Philadelphia’s Water,” (David Reckhow, PI) Philadelphia Water Department, 12/1/2012-5/31/2017, \$460,000.

“Epigenotyping in Peripheral Blood Cell DNA and Risk of Breast Cancer”, (Susan R. Sturgeon, PI, David A. Reckhow & others, Co-PI) US National Institutes of Health 4/1/2013-3/30/2015, \$460,742.

“Control of Diene Compounds at MWRA”, (David A. Reckow, PI), Massachusetts Water Resources Authority, 8/1/2014-7/31/2015, \$15,000

“MRI: Acquisition of A Versatile High Resolution MS System for Determination of Small Molecules of Environmental and Health Concern,” (David A. Reckhow, PI & 15 others), National Science Foundation, 9/1 2014 – 8/31/2016, \$455,000.

“Mobile Pilot Trailer for Water and Wastewater Treatment,” (David A. Reckhow, PI), MA Clean Energy Center, 9/1/2014-8/31/2017, \$100,000.

“Water Innovation Network for Sustainable Small Systems”, (David A. Reckhow, PI; John E. Tobiason, Caitlyn Butler, Chul Park, Co-PIs), US Environmental Protection Agency, 7/1/2014-6/30/2017, \$4,100,000.

“Strategies for Minimizing Adverse Impacts of an Oil Spill in Wachusett Reservoir on MWRA’s Finished Water,” (David A. Reckhow, PI, John E. Tobiason, Co-PI), MWRA, 7/1/2015-6/30/2016, \$97,568.

“Assistance to Small Water Systems in Massachusetts,” (John E. Tobiason & David A. Reckhow, Co-PIs), Massachusetts Department of Environmental Protection, 7/31/2015-6/30/2017, \$196,663

“Manganese and DBP Control for AWC Mystic System and Mn Sequestration”, (John E. Tobiason, PI and David Reckhow, Co-PI), Aquarion Water Company of CT, 09/01/2015 - 08/31/2016, \$133,226.

“Creating a Water Education and Innovative Ecosystem”, (Karen Oates, PI, David A. Reckhow, Co-PI), NSF, 2/1/2016-1/31/2017, \$49,950.

“Evaluation of Compost for Erosion Control when Used in Actual Highway related Applications”, (Carl Ho, PI and David A. Reckhow, Co-PI), MA DOT, 2/04/2016 – 12/31/2017, \$363,410

“Assistance Programs for the Assessment of Lead in School Drinking Water”, (John E. Tobiason & David A. Reckhow, Co-PIs), Massachusetts Department of Environmental Protection, 5/21/2016-10/31/2016, \$1,398,766.

“Strategies for Minimizing Adverse Impacts of an Oil Spill in Wachusett Reservoir on MWRA’s Finished Water, Year 2,” (David A. Reckhow, PI, John E. Tobiason, Co-PI), MWRA, 7/1/2016-6/30/2017, \$94,678.

Enhanced Fuel Cells for Wastewater Treatment, assistance with USAF SBIR, (David A. Reckhow) FTL Labs, 2/28/2017-8/31/2017, \$8,900

Secondary Wastewater Reuse Via Modular Integrated UF Membrane System, (David A. Reckhow) Town of Amherst, \$150,000

CONSULTING

AECOM, Concord, MA – Assisted with assessment of 15 drinking water systems in Vermont regarding compliance with the D/DBP Rule.

American Water Works Association; Denver, CO - Assisted in Development of Research Ideas and RFPs (several workshops)

Arcadis or Malcolm Pirnie, Inc.: USEPA - Development of 5-year Research Plan for Drinking Water; WRF, Unintended Consequences of Treatment Changes for Controlling NDMA

CDM Smith or Camp, Dresser & McKee, Inc., Cambridge, MA. - Consultation on many Water Projects around the US (Springfield, MA; Newport RI and MWRA, MA are a few of the most recent)

CH2M Hill Consulting Engineers; various offices - Design of Bench-scale Treatability Studies and Interpretation of Pilot-Scale Data; Boston, MA - Design of Bench-scale Treatability Studies, Norfolk, VA - Design of Pilot-scale Treatment Program; Tulsa, OK - Participation in Ozone Workshop

Compagnie Générale des Eaux, Paris, France - Modeling disinfection byproducts in the Paris Suburban water distribution network.

CHA Consulting, treatment options for Benkelman, NE; Front Royal, VA

Environmental Engineering & Technology Consulting Engineers; Newport News, VA - Bench-scale Treatability Studies

Havens & Emerson Consulting Engineers; Saddle Brook, NJ - Design of Pilot-scale Treatability Studies for Passaic Valley Water Commission

HDR Engineers, Raleigh, NC – Upgrade of Cary NC Water Treatment Facility

International Life Sciences Institute - Estimating human exposure to contaminants in drinking water

New York City: Value Engineering Panel for Croton WTP; DEP Watershed modeling under CUNY Foundation

Olver Incorporated, Blacksburg, VA – Consultation on Washington Co. water project and others.

Tighe & Bond Consulting Engineers; Westfield, MA - Design of Pilot-scale Treatability Studies for Amherst, MA

U.S. Environmental Protection Agency - Workgroup for the Negotiated Regulation process for disinfection byproducts; assisting FACA, SAB, Review of NYC Watershed Protection Program

U.S. Geological Survey; Denver, CO - Analysis of Aquatic Organic Matter

Woodard & Curran, Inc, Consulting Engineers, Bangor, ME: - Consultation on Bath ME project

October 1, 2016