SCOTT WALLACE, P.E.

NATURALLY WALLACE CONSULTING

Mr. Wallace is the founding partner of Naturally Wallace Consulting (NWC). He is a technology expert known for his innovative, practical water treatment solutions, including winning National Engineering Excellence Awards in 2005, 2009 and 2017 from the American Council of Engineering Companies (ACEC) for pioneering wetland treatment projects.

Scott was the co-author of *Treatment Wetlands, Second Edition*, widely considered to be the definitive textbook on wetland treatment system design. He was also Principal Investigator for *Small-Scale Constructed Wetland Treatment Systems; Feasibility, Design Criteria, and O&M Requirements* for the Water Environment Research Foundation. He has designed over 250 treatment systems in 22 countries.

A prolific author and inventor, Scott holds 8 patents on wetland treatment systems. He invented the original aerated wetland process (Forced Bed Aeration) in 1997 and recently was a co-inventor of the Rhizoph'air process, and successfully carried this through to the issuance of a US Patent on the Rhizoph'air system (United States Patent 10,526,222). He has been the author or co-author of over 80 scientific papers.

Significant projects which Scott has been involved in include the Fernhill Western Wetlands Project in Hillsboro, Oregon; the hydrocarbon remediation treatment wetlands in Casper, Wyoming, Wellsville, New York, and Cano Limon, Colombia; and the wetland treatment systems for deicing runoff in Buffalo, New York, Grand Rapids, Michigan, and Heathrow Airport in London.

He has also worked extensively with natural wetlands, including the US Steel wetland mitigation banking project in Minnesota, the Rahr Malting point-nonpoint source nutrient trading permit, and the Hammond Assimilation Wetland project in Louisiana.

Prior to becoming an engineer, Scott worked as a wastewater treatment plant operator, bench chemist, and field services technician. He is often engaged in projects from conceptual design through construction, start-up and commissioning. Scott spends extensive time in the field on projects in the Americas, Europe, Asia and Africa.

EDUCATION

B.S. Civil Engineering:
University of Iowa, 1986

M.S. Environmental Engineering:
University of Iowa, 1989

PROFESSIONAL REGISTRATIONS

Registered Professional Engineer: Florida (61319), Iowa (12574), Michigan (6201045293), Minnesota (23583), New York (080749-1), North Carolina (29762), Virginia (0402-025968), Wisconsin (33248-006)

PROFESSIONAL ASSOCIATIONS

International Water Association (IWA) Specialist Group on the Use of Macrophytes for Water Pollution Control

CAREER SUMMARY

Naturally Wallace Consulting (October 2009 – Present)

Stantec Inc. (January 2009 - October 2009)

Jacques Whitford (April 2007 - January 2009)

North American Wetland Engineering (April 1997 - April 2007)

HDR Engineering (May 1994 - April 1997)

Shive-Hattery Engineers and Architects (December 1991 - May 1994)

CH2M HILL (August 1988 - December 1991)

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SELECTED PROJECT EXPERIENCE

Design Textbooks

***Treatment Wetlands, Second Edition*, CRC Press, Boca Raton Florida**

Co-author of the second edition of the definitive reference text, Treatment Wetlands, published in 2009.

Water Environment Research Foundation, Alexandria Virginia)

Responsible for a 4-year research project that assessed 1,604 wetland treatment systems in 19 countries. The final report, Small Scale Constructed Wetland Wastewater Treatment Systems - Feasibility, Design Criteria, and O&M Requirements, is used by the United Nations (UNESCO) as their textbook on wetland treatment systems in developing countries.

Consortium of Institutes for Decentralized Wastewater Treatment

Author of the university curriculum module entitled Constructed Wetlands: Design Approaches, available at http://www.onsiteconsortium.org/curriculum/activities.cfm

Patents

Aerated racetrack wetland for treating wastewater. United States Patent 10,730,773. (with M. Mozzafari, E. Shafiepour, A. Hasani, and S. Mirabagheri). 2020.

Wastewater purification device and utilization. United States Patent 10,526,222. (with S. Troesch, D, Esser, and D. van Oirschot). 2020.

Aerated racetrack wetland for treating wastewater. Iran Patent 97,287. (with M. Mozzafari, E. Shafiepour, A. Hasani, and S. Mirabagheri). 2020.

System and Method for Removing Pollutants from Water. Canada Patent 2,372,331. 2005

System and Method for Removing Pollutants from Water. United States Patent 6,652,743. 2003.

Adsorption field reclamation and maintenance system. United States Patent 6,576,130. 2003

Method for Removing Pollutants from Water. United States Patent 6,406,627. 2002.

System for Removing Pollutants from Water. United States Patent 6,200,469. 2001.

Oil & Gas

Shell Petroleum, Pearl GTL Facility, Qatar

Process consultant responsible for the design and implementation of a pilot wetland system to treat gas condensate produced water at Ras Laffan, Qatar.

PetroChad (Mangara) Glencore, Chad

Process consultant leading the design/build/operate services for treatment wetlands at the Badila and Mangara oil fields in southern Chad. NWC partnered with the US/Chadian firm GER/Norwest International to implement five wetland treatment systems for management of camp facility wastewater graywater, stormwater runoff, and oil produced water.

GASCO, Abu Dhabi, United Arab Emirates

Process consultant responsible to assist GASCO with the implementation and operation of four pilot wetland treatment systems for produced water management. NWC partnered with the firm CH2M HILL to implement the pilot treatment systems.

British Petroleum, United Kingdom

Process consultant responsible for the design and analysis of a pilot treatment system to evaluate remediation of North Sea produced Water. NWC partnered with the UK firm ARM to implement the project.

British Petroleum, Baku, Azerbaijan

Process consultant responsible for the evaluation of produced water treatment alternative at the Sangachal Terminal complex to produce effluent suitable for a discharge to the Caspian Sea.

Occidental Petroleum, Cano Limon, Colombia

NWC and the Colombian firm Valrex were retained by Occidental Petroleum to upgrade and expand the produced water treatment system at the Cano Limon oil production field in eastern Colombia. Additional treatment was needed due to changing environmental regulations and the need to more effectively remove phenols from the produced water. The final lagoon-based treatment system processes 350,000 m^3/d (90 MGD) of low-salinity produced water.

Airport Deicing

Gerald R. Ford International Airport, Grand Rapids, Michigan

Process consultant responsible for hydraulic design of fill-and-drain vertical flow wetlands designed to treat deicing

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runoff and reduce organic loadings on the Thornapple River. NWC partnered with the Grand Rapids-based firm Prein & Newhoff to implement the treatment solution, which included a 1-mile long outfall pipeline and an in-river diffuser. The resulting system won a 2017 National Engineering Excellence Award from the American Council of Engineering Companies.

Buffalo Niagara International Airport, Buffalo, New York

Lead the pilot testing, design, construction, and start-up of a subsurface flow wetland designed to treat glycol-contaminated runoff. The systems treats over 10,000 pounds per day of BOD during the winter months (more than a city of 70,000 people). The resulting project won a 2009 National Award for Engineering Excellence from the American Council of Engineering Companies.

British Airports Authority, Heathrow Airport, London, United Kingdom

Lead the redesign, optimization, and construction of facility improvements at the Mayfield Farm wetland treatment works at London's Heathrow Airport. These process improvements resulted in an 8-fold increase in treatment capacity compared with the original facility design, with no increase in wetland area. NWC partnered with the UK-based firm ARM to implement the design/build project.

Charles de Gaulle Airport, Paris, France

Process consultant responsible design and data analysis from a pilot-scale aerated wetland system to treat aircraft deicing runoff impacted by glycol and acetate compounds. NWC teamed with the French company SINBIO to implement the project.

Edmonton International Airport, Alberta

Process consultant responsible for establishing design parameters and designing means to optimize and upgrade the existing wetland treatment works at EIA. NWC worked as a sub-consultant to the Canadian firm Associated Engineering for the 2011 upgrades and with the Canadian Firm MMM Group Ltd. For the 2015 upgrades.

MacArthur International Airport, Islip New York

Lead the overall design team responsible to implement a subsurface treatment solution for treatment of aircraft-contaminated deicing runoff. After meeting New York State regulatory standards, treated effluent is discharged to groundwater via an infiltration gallery to recharge the local freshwater aquifer on Long Island. NWC teamed with the local engineering firm Eryou Engineering to implement the project.

Groundwater Remediation

Confidential Client, Hungary

Technology expert responsible for the design of an engineered wetland system to remove chlorinated organic compounds (PCE, TCE, DCE, VC), nitrate and sulfate at a property operated by a Fortune 100 company. The resulting system is the largest wood chip bioreactor wetland in the world. Additional services included detailed design support, and assistance with project start-up and commissioning. NWC teamed with the engineering firm MWH (now Stantec) to implement the project.

El Paso Energy, El Dorado, Kansas

Lead the design of a three-stage wetland remediation system at the former El Dorado refinery site. The wetland system implemented by El Paso Energy remediates a variety of metals, petroleum hydrocarbons (TPH) and chlorinated solvents (TCE) from an off-site contaminant plume. NWC partnered with the engineering firm MWH (now Stantec) to implement the wetland solution.

Atlantic Richfield Company (British Petroleum), Wellsville, New York

Technology expert responsible for developing wetland treatment parameters, design documents, and start-up assistance for the removal of iron, manganese, BTEX, aniline and nitrobenzene from a former refinery site along the Genessee River.

British Petroleum, Casper, Wyoming

Lead the design of a 3.3-acre (1.3 ha) constructed wetland for BTEX treatment at the former Casper Refinery site. Additional unit processes included air stripping of benzene, cascade aeration for iron oxidation, and a surface flow wetland for removal of ferric hydroxide precipitates at a design flow rate of 1.6 MGD (6,000 m^3/d). The wetland treatment facilities are located in the middle of an 18-hole golf course constructed at the former refinery site. This project won a 2005 National Award for Engineering Excellence from the American Council of Engineering Companies (ACEC)

Former Farmland Industries Site, Joplin, Missouri

Developed the overall process design for the treatment of gypsum stack leachate from an abandoned Superfund site. Was responsible for developing and supervising work carried out by Ecole Polytechnique on the evaluation of blast furnace slag filters at the pilot scale.

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Municipal Wastewater Treatment

Clean Water Services, Hillsboro Oregon

Process consultant responsible for the conceptual design of the Fernhill Western Wetland project, an 18 MGD (68,000 m^3/d) vertical flow wetland system to polish municipal wastewater effluent from the Forest Grove, Oregon WWTP. This innovative wetland uses the ion exchange properties of basalt minerals to enhance nitrification. Additional services included detailed design support, and assistance with project start-up and commissioning. NWC teamed with the local firm Kennedy-Jenks to implement the project.

Louisiana Department of Environmental Quality (LDEQ), Hammond, Louisiana

Wetland technology expert retained by LDEQ to conduct an independent assessment of the 10,000 acre (4,540 ha) natural wetland area north of Lake Pontchartrain for assimilation of 8 MGD (30,000 m^3/d) of treated municipal effluent. This study involved numerical modeling of the extent of the active nutrient assimilation zone, field investigations (including tree ring dating of cypress swamps), and recommendations for permitting of future wetland assimilation projects in the State of Louisiana.

Helmholtz Center for Environmental Research (UFZ), Leipzig, Germany

Process engineer responsible for the design of aerated and fill-and-drain treatment cells at a research facility to study the use of constructed wetlands to treat municipal wastewater in Langenreichenbach, Germany. The research center has 13 different constructed wetland configurations to allow side-by-side comparisons of treatment performance under a variety of environmental and loading conditions. Originally implemented in 2008, the facility was upgraded and expanded in 2016, and had produced over a dozen peer-reviewed scientific research papers.

Province of Nunavut, Canada

Responsible for the establishment of approval criteria with Environment Canada for seasonal arctic wetland systems that allow treatment of municipal wastewater under permafrost conditions. Lead the design teams for implementation of seasonal arctic wetlands to replace failing lagoons at Coral Harbour, Chesterfield Inlet, and Baker Lake.

Severn Trent Water, Coventry, United Kingdom

Design Engineer responsible for the retrofit of existing reed bed systems throughout the United Kingdom with aerated wetlands (Forced Bed Aeration). This work was part of an ongoing study to assess the benefits of aeration to improve ammonia removal and reduce the potential of clogging in subsurface flow treatment wetlands. As a result of this study, aerated wetlands are the preferred technology solution for sewage works less than 2000 population equivalents (PE). NWC teamed with the UK-based firm ARM to implement the projects.

U.S. State Department, Abu Dhabi, United Arab Emirates

Lead for the design of a wetland treatment facility for effluent reuse at the United States Embassy in the United Arab Emirates. The constructed wetland allows the Embassy to be independent of grid utilities as a security measure.

Iowa Policy Project, Mt. Vernon, Iowa

In conjunction with the University of Iowa Department of Civil and Environmental Engineering, developed Ecological Wastewater Management for Small Iowa Communities, a report addressing technology options and challenges to implementation of zero-discharge and reduced-discharge wastewater systems within the state of Iowa

Boy Scouts of America, Charles L. Sommers High Adventure Base, Ely, Minnesota

Lead for regulatory negotiations regarding the decommissioning of an existing pond system and eliminating potential discharge points into the Boundary Waters Canoe Area Wilderness on the U.S./Canadian border. The existing system was replaced with a constructed wetland with drainfield disposal (winter use) and at-grade disposal trenches (summer use)

General Motors, Saginaw Michigan

Lead for the planning and design of a demonstration wetland pilot at the Saginaw Metal Castings plant. The constructed wetland treats industrial wastewater and recycles it for use in a stream and waterfall with a fishpond. This project was selected as a finalist for the 2000 Environmental Excellence in Transportation Award from the Society of Automotive Engineers

Independent School District 831, Forest Lake, Minnesota

Lead the replacement of existing septic systems at Scandia, Linwood, and Columbus Elementary Schools. Technologies used to achieve compliance include intermittent sand filters, subsurface drip irrigation, at-grade beds, and gravel-less chamber drainfields. The District won the 2001 Minnesota Environmental Initiative Award for the wastewater upgrades

Lutsen Resort, Lutsen, Minnesota

Lead for the design, permitting, and construction of wetland treatment systems and associated infrastructure for Lutsen Resort, Poplar River Condominiums, and Lutsen Sea Villas, all located on the shoreline of Lake Superior

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Jackson Meadow, Marine on St. Croix, Minnesota

Responsible for the design and permitting of two subsurface flow wetland treatment systems as an alternative to conventional onsite septic systems for 64 homes. This project won a Minnesota Honor Award from the American Institute of Architects and the 2002 Minnesota Environmental Initiative Award

Fields of St. Croix, Lake Elmo, Minnesota

Responsible for the design and permitting of a subsurface flow wetland treatment system as an alternative to conventional onsite septic systems for 46 homes. This was the first large-scale constructed wetland treatment system permitted by the Minnesota Pollution Control Agency. The developer, Robert Engstrom Companies won the 1998 Minnesota Environmental Initiative Award for this project

Indian Creek Nature Center, Cedar Rapids, Iowa

Design, construction, and operation of a subsurface flow wetland system for wastewater treatment. This system was featured in the May/June 1996 issue of Land and Water Magazine, the July 1997 issue of Smithsonian Magazine, and the January 1998 issue of Public Risk Magazine.

City of Monticello, Minnesota

In charge of treatment process selection and design for expansion of the existing wastewater treatment plant. Unit process design responsibilities included influent screening and grit removal, a new 2.3 MGD (8,700 m^3/d) sequencing batch reactor (SBR), and rehabilitation of two existing anaerobic digesters

City of Maquoketa, Iowa

Project manager, lead process engineer, and principal client contact for wastewater infrastructure improvements. Project responsibilities included replacement of existing rotating biological contactor (RBC) units, design of two new raw sewage lift stations and a new 0.6 MGD (2,300 m^3/d) sequencing batch reactor (SBR)

Stormwater/Water Resources

National Water Resources Capacity Development Project

Hydrogeological Investigations for Large Cluster and High-Density Wastewater Soil Absorption Systems, a groundwater mounding study evaluating different field techniques and modeling methods for assessing hydraulic conductivity and groundwater mounding

Indian Creek Nature Center, Cedar Rapids, Iowa

Responsible for the design and construction of the Bena Brook Wetland Learning area. This outdoor classroom features a variety of aquatic habitats for hands-on learning. The 2-acre (0.8 ha) wetland creation occurred in a former wetland area drained during construction of the transcontinental railroad. This project was featured in the January/February 2001 issue of Wild Outdoor World magazine

US Steel Gary Works, Gary, Indiana

In charge of development of the initial Stormwater Pollution Prevention Plan (SWPPP) for the largest integrated steel mill in the United States. Additional services included coordinating the preparation of over 100 contractor SWPPP's

Wetlands & Natural Resources

Bruce Swenson Farm, Scandia, Minnesota

Responsible for the design, permitting, and construction of a 13-acre (5.3 ha) wetland restoration project. The resulting mitigation credits were banked under the Minnesota Wetland Conservation Act

Arcelor Mittal (US Steel), Mountain Iron, Minnesota

Responsible for the restoration of 480 acres (194 ha) of wetlands to create a private wetland mitigation bank. Services included design of wetland restoration, 404/401 permitting, Minnesota Wetland Conservation Act permitting and associated wetland banking deed restrictions. This banking site was used by US Steel to mitigate for all past, present and future wetland impacts associated with iron mining in the State of Minnesota

Whispering Meadows Park, City of Iowa City, Iowa

Responsible for the planning, design, and construction supervision of the Whispering Meadows Wetland Park. Project activities included design of a 7-acre (2.8 ha) surface flow constructed wetland for stormwater treatment and wildlife habitat plus the creation of 10 acres (4 ha) of tallgrass prairie. Additional services included design of walking trails, boardwalks, and observation platforms

Rahr Malting Company, Shakopee, Minnesota

Worked with Minnesota Pollution Control Agency technical staff to develop numerical standards for point/nonpoint effluent load trading. The resulting NPDES permit was one of the first nutrient trading agreements in the United States. Rahr Malting won the 1997 Minnesota Environmental Initiative Award for this permit, which was featured in numerous press releases, including two programs on National Public Radio. Rahr's effluent trading program has been featured in magazines such as Runoff Report, Water Environment & Technology and Industrial Wastewater

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SELECTED PUBLICATIONS

Wastewater purification device and utilizations. United States Patent 10,526,222. (with S. Troesch, D, Esser, and D. van Oirschot). 2020.

Hydraulic characterization and removal of metals and nutrients in an aerated horizontal subsurface flow "racetrack" wetland treating primary-treated oil industry effluent. (with M. Mozaffari, E. Shafiepour, S. Mirbagheri, G. Rakhshanderoo, and A. Stefanakis). *Water Research 200* (2020).

A review of emerging organic contaminants (EOCs), antibiotic resistant bacteria (ARB), and antibiotic resistance genes (ARGs) in the environment: Increasing removal with wetlands and reducing environmental impacts. (with J. Garcia, M.J Garcia-Galan, J. Day, R. Boopathy, J. White and R. Hunter). *Bioresource Technology, 2020.*

Lessons learnt from a pilot study on residual dye removal by an aerated treatment wetland. (with F. Masi, A. Rizzo, N. Martinuzzi, F. Macor, D. Van Oirschot and R. Bresciani). *Science of the Total Environment* 648 (2019) 144-152.

Scientific and Technical Report Series No. 27. Wetland Technology: Practical information on the design and application of treatment wetlands. Co-author of modules 5.7 and 5.8. (ed. By G. Langergraber, G. Dotro, J. Nivala, A. Rizzo, and O. Stein). *IWA Publishing* (2019).

Side-by-side comparison of 15 pilot-scale conventional and intensified subsurface flow wetlands for treatment of domestic wastewater. (with J. Nivala, J. Boog, T. Headley, T. Aubron, H. Brix, S. Mothes, M. van Afferden, and R. Müller). *Science of the Total Environment* 658 (2019) 1500-1513.

Treatment of wastewater from a fruit processing industry with an aerated wetland. (with D. van Oirschot). 16th IWA International Conference on Wetland Systems for Water Pollution Control, Valencia, Spain, 2018.

Aerated constructed wetlands for swine wastewater treatment: Experiences from the start-up of a full-scale system in Italy. (with A. Rizzo, F. Masi, D. van Oirschot and R. Bresciani). 16th IWA International Conference on Wetland Systems for Water Pollution Control, Valencia, Spain, 2018

Pilot study for an aerated wetland treating textile industry wastewater. (with D. Van Oirschot). 7th International Conference on Wetland Pollutant Dynamics and Control. Big Sky, Montana, 2017.

Up-flow anaerobic sludge blanket and aerated constructed wetlands for swine wastewater treatment: a pilot study. (with F. Masi, A. Rizzo, N. Martinuzzi, D. Van Oirschot, P. Salazzari, E. Meers and R. Bresciani). 15th IWA International Conference on Wetland Systems for Water Pollution Control, Gdansk, Poland, 2016

Treatment wetland aeration without electricity? Lessons learned from the first experiment using a wind-driven air pump. (with J. Boog, J. Nivala, T. Aubron, C. Sullivan, M. van Afferden and R. Muller). *Water* 2016, 8, 502.

Nitrification cessation and recovery in an aerated saturated vertical subsurface flow treatment wetland: Field studies and microscale biofilm modeling. (with C. Murphy, A. Rajabzadeh, J. Nivala and D. Cooper). *Bioresource Technology*, v. 209 (2015).

Treatment performance of an aerated constructed wetland treating glycol from de-icing operations at a UK airport. (with C. Murphy, R. Knight, D. Cooper and T. Sellers). *Ecological Engineering*, 2015.

Treatment of industrial effluents in constructed wetlands; Challenges, operational strategies and overall performance (with S. Wu, H. Brix, P. Kuschk, W.P. Kirui, F. Masi and R. Dong. *Environmental Pollution* 201 (2015) 107-120.

Wastewater treatment in a compact intensified wetland system at the Badboot: a floating swimming pool in Belgium (with D. van Oirschot and R. van Deun). *Environmental Science and Pollution Research, DOI 10.1007/s11356-014-3726-6, 2014.*

Reducing wetland area requirements by using intensification strategies. 14th IWA International Conference on Wetland Systems for Pollution Control, Shanghai, China, 2014.

BOD removal and nitrogen transformations in an intermittently aerated vertical treatment wetland (with D. van Oirschot). 14th IWA International Conference on Wetland Systems for Pollution Control, Shanghai, China, 2014.

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Nitrification cessation and recovery field study in an aerated saturated vertical flow treatment wetland (with C. Murphy, A. Rajabzadeh, K. Weber, J. Nivala and D. Cooper). 14th IWA International Conference on Wetland Systems for Pollution Control, Shanghai China 2014.

Hydraulic characterization and optimization of total nitrogen removal in an aerated vertical subsurface flow wetland. (With J. Boog, J. Nivala, and T. Aubron). *Bioresource Technology*, 2014.

Oxygen transfer and consumption in subsurface flow wetlands. (With T. Headley, J. Nivala, and K. Kassa). *Ecological Engineering*, 2013.

Comparative analysis of constructed wetlands: The design of the ecotechnology research facility at Langenereichenbach, Germany. (With J. Nivala, T. Headley and K. Kassa). *Ecological Engineering*, 2013.

Escherichia coli Removal and Internal Dynamics in Subsurface Flow Ecotechnologies: Effects of Design and Plants. (with T. Headley, J. Nivala, K. Kassa, L. Olsson, H. Brix, M. van Afferden, and R. Müller). *Ecological Engineering* (2013).

Treatment Performance of Two Aerated Saturated Vertical Flow Constructed Wetlands Treating Settled Sewage (with C. Murphy and D. Cooper). 13th International Conference on Wetland Systems for Water Pollution Control, Perth Australia 2012.

Conventional and Intensified Subsurface Flow Treatment Wetlands: Comparative Analysis Using the P-k-C* Model (with J. Nivala, H. Brix, T. Aubron, T. Headley, K. Kassa and M. van Afferden). 13th International Conference on Wetland Systems for Water Pollution Control, Perth Australia 2012.

Clogging in Subsurface-Flow Treatment Wetlands: Measurement, Modeling and Management (with J. Nivala, P. Knowles, G. Dotro and J. Garcia). *Water Research* 46 (2012) 1625-1640.

Model of Phosphorus Precipitation and Crystal Formation in Electric Arc Furnace Steel Slag Filters (with D. Claveau-Mallet and Y. Comeau). *Environmental Science & Technology*, January 2012

Underground Treatment of Airport Deicing Fluid, (with M Liner) *Water Online & PublicWorks.com*, September 2011.

Verdant and Versatile: The Adaptable Nature of Reed Bed Treatment, *Water 21*, International Water Association, United Kingdom, August 2011.

Long Term Hydrocarbon Removal in Treatment Wetlands (with M. Schmidt and E. Larson). Society of Petroleum Engineers, November 2011.

Treatment Wetlands for Complex Waste Streams. *Water 21*, International Water Association, London, United Kingdom, 2011.

Design and Performance of the Wetland Treatment System at the Buffalo-Niagara International Airport (with M. Liner). IWA Specialist Group on the Use of Macrophytes in Water Pollution Control. Newsletter No. 38. June, 2011.

Steel Slag Filtration for Extensive Treatment of Mining Wastewater (with D. Claveau-Mallet and Y. Comeau). 2011 WEFTEC Conference, Los Angeles, California.

A Full-Scale Trial to Determine Treatment Efficacy of Aerated Constructed Wetlands to Treat Glycol from De-Icing Operations at Airports (with M. Liner, C. Murphy, D. Cooper and R. Knight). Wetland Pollutant Dynamics and Control, Prague, Czech Republic, 2011.

Effect of Plants and Design on Oxygen Transfer in Treatment Wetlands (with J. Nivala, T. Headley, H. Brix, and R. Müller). Wetland Pollutant Dynamics and Control, Prague, Czech Republic, 2011.

Application of Constructed Wetlands for Industrial Wastewater Treatment. 12th International IWA Specialist Group Conference on Wetland Systems, Venice, Italy, 2010.

Nutrient Limitations in Industrial Treatment Wetlands (with M. Liner). 12th International IWA Specialist Group Conference on Wetland Systems, Venice, Italy, 2010.

Application of Constructed Wetlands for Industrial Wastewater Treatment. 2nd Irish International Conference on Constructed Wetlands for Wastewater Treatment and Environmental Pollution Control. University College Dublin, Ireland. 2010.

The Design & Operation of a Very Large Vertical Subs-surface Flow Engineered Wetland to Treat Spent Deicing Fluids and Glycol-Contaminated Stormwater at Buffalo Niagara International Airport (with J. Higgins, K. Minkel, R. Wagner, M. Liner and G. Meal). 12th International IWA Specialist Group Conference on Wetland Systems, Venice, Italy, 2010.

TAYA – Intensive Wetland Technology Facilitates the Treatment of High Loads of Organic Pollutants and Ammonia (with T. Ronen). 12th International IWA

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Specialist Group Conference on Wetland Systems, Venice, Italy, 2010.

Treatment Wetlands, Second Edition (with R. Kadlec). CRC Press, Boca Raton, Florida, 2009.

Engineered Wetland Design for Produced Water Treatment (with B. Davis and R. Wilson). Society of Petroleum Engineers, 2009.

Emerging Models for Nitrogen Removal in Treatment Wetlands (with D. Austin), *Journal of Environmental Health*, vol. 71 no. 4, 2008.

Aerated cold-climate HSSF treatment wetlands: *P-k-C** modeling results. 11th International Conference on Wetland Systems for Water Pollution Control, Indore, India. 2008.

Statistical analysis of treatment performance in aerated and non-aerated subsurface flow constructed wetlands (with J. Nivala and T. Meyers). In *Wastewater Treatment, Plant Dynamics and Management in Constructed and Natural Wetlands* (J. Vymazal, ed.). Springer Science, 2008.

Constructed Treatment Wetlands: Innovative Technology for the Petroleum Industry (with P. Eke and M. Scholz). Society of Petroleum Engineers, November 2007.

Degradation of aircraft deicing runoff in aerated engineered wetlands (with M. Liner, J. Higgins and J. Diebold). Multifunction of Wetland Systems, University of Padua, Italy 2007.

Oxygen transfer efficiency in aerated subsurface flow wetlands (with M. Liner, D. Redmon and M. Hildebrand). Wetland Pollutant Dynamics and Control, University of Tartu, Estonia. 2007.

Unsewered Communities: Are Alternative Treatment Technologies the Solution? Proceedings of the NOWRA Annual Meeting. National Onsite Wastewater Recycling Association, Laurel Maryland. 2007.

Small Scale Constructed Wetland Wastewater Treatment Systems: Feasibility, Design Criteria and O&M Requirements (with R. Knight). Water Environment Research Foundation, 2006.

High-Rate Ammonia Removal in Aerated Engineered Wetlands (with J. Higgins, A. Crolla, C. Kinsley, A. Bachand, and S. Verkuijl). 10th International IWA Specialist Group on Wetland Systems, Lisbon, Portugal, 2006.

Use of Pollutant Trading to Improve Riparian Habitats. Wetland Pollutant Dynamics and Control. University of Ghent, Belgium. 2005.

Ecological Wastewater Management in Iowa: Hope for Iowa's Unsewered Communities (with G. Parkin, B. Ballavance, and R. Brandt). The Iowa Policy Project; Mt. Vernon, Iowa, October 2005.

Short Communication: Relationship Between Evapotranspiration and Pan Evaporation in Cold-Climate Subsurface Flow Wetlands (with J. Nivala). IWA Specialist Group on the Use of Macrophytes in Water Pollution Control. Newsletter No. 30. September, 2005.

System and Method for Removing Pollutants from Water. Canadian Patent 2,372,331. 2005.

Thermal Response of a Horizontal Subsurface Flow Wetland in a Cold Temperate Climate (with J. Nivala). IWA Specialist Group on the Use of Macrophytes in Water Pollution Control. Newsletter No. 29. February 2005.

BTEX Degradation in a Cold-Climate Wetland System (with R. Kadlec). 9th International IWA Specialist Group Conference on Wetland Systems, Avignon France, 2004.

Tracer Studies in a Pilot-Scale Subsurface Flow Wetland System Treating Landfill Leachate (with J. Nivala). 9th International IWA Specialist Group Conference on Wetland Systems, Avignon France, 2004.

Remediation Marathon Style. Environmental Protection, Stevens Publishing Group, Dallas Texas, June 2004.

Applications of Subsurface Drip Dispersal Technology in Engineered Ecological Systems (with R. Ruskin and M. Blumberg). 2004 WEFTEC Conference, New Orleans Louisiana.

Constructed Wetlands: Design Approaches. Consortium of Institutes for Decentralized Wastewater Treatment. 2004.

System and Method for Removing Pollutants from Water. United States Patent 6,652,743. 2003.

Cold Weather Insulation of Septic Tanks and Other Infrastructure (with C. English). Onsite Journal, Vol. 12 No. 2. National Onsite Wastewater Recycling Association, Laurel Maryland. 2003.

Absorption Field Reclamation and Maintenance System. United States Patent 6,576,130. 2003.

Management of Cluster Wastewater Systems (with C. Sparks and A. Matthys). Proceedings of the NOWRA Annual Meeting. National Onsite Wastewater Recycling Association, Laurel Maryland. 2002.

Use of Constructed Wetlands for Nitrogen Removal. Proceedings of the NOWRA Annual Meeting. National Onsite Wastewater Recycling Association, Laurel Maryland. 2002.

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Method for Removing Pollutants from Water. United States Patent 6,406,627. 2002.

Cold-Climate Wetlands: Design and Performance (with G. Parkin and C. Cross). Water Science & Technology, Vol. 44 No. 11-12, IWA Publishing, 2001.

Vertical Flow Wetlands for Home Septic Treatment (with J. Higgins). Proceedings of the Ecological Engineering Conference 2001, International Ecological Engineering Society, Canterbury, New Zealand. 2001.

Wastewater System Options; Providing Solutions for Small Communities (with D. Hallahan). CE News, October 2001. Civil Engineering News Inc., Alpharetta Georgia.

Design & Performance of Drip Irrigation Systems in Freezing Environments. Proceedings of the NOWRA Annual Meeting. National Onsite Wastewater Recycling Association, Laurel Maryland. 2001.

On-Site Remediation of Petroleum Contact Wastes Using Subsurface Flow Wetlands. Wetlands and Remediation II: Proceedings of the Second International Conference on Wetlands and Remediation. Battelle Press, 2002

Treatment of Cheese-Processing Waste Using Subsurface Flow Wetlands. Wetlands and Remediation II: Proceedings of the Second International Conference on Wetlands and Remediation. Battelle Press, 2002.

Advanced Designs for Constructed Wetlands. BioCycle vol 42 no. 6. J.G. Press Inc., Emmaus Pennsylvania. 2001.

System for Removing Pollutants from Water. United States Patent 6,200,469. 2001.

A Comparison of Constructed Wetlands Used to Treat Domestic Wastes: Conventional, Drawdown, and Aerated Systems (with A. Matthys and G. Parkin). 7th International IWA Specialist Group Conference on Wetland Systems, Orlando, Florida, 2000.

Putting Wetlands to Work, Civil Engineering, July 1998, American Society of Civil Engineers.

Nonpoint Source Trading Creates New Discharge Opportunities; Water Environment & Technology, July/August 1997; Water Environment Federation.

Indian Creek Nature Center Constructed Wetlands for Wastewater Treatment, Constructed Wetlands in Cold Climates Symposium, Niagara-on-the-Lake, Ontario, June 1996.

Nutrient Balances for Dairy Best Management Practices (with D. Ellington). Proceedings of the Conference on Environmentally Sound Agriculture, Orlando, Florida. 1991.

Neutralization of Acidic Deposition through Soil-Water Interactions, Master's Thesis, Department of Civil & Environmental Engineering, University of Iowa, Iowa City Iowa. 1989.

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