BRIAN GALLAGHER

Water Quality & Treatment Solutions, Inc.
An Environmental Engineering & Science Consulting Company

21018 Osborne Street, Suite 1
Canoga Park, CA 91304
Tel: 818-435-4500 ext. 103
Fax: 818-484-3100
Email: brian.gallagher@wqts.com
URL: http://www.wqts.com

EDUCATION:

B.S., Medical Technology, California State University, Los Angeles 1994

PROFESSIONAL EXPERIENCE:

Water Quality & Treatment Solutions, Inc.
Canoga Park, California
2007 – present: Senior Scientist

MWH
Pasadena, California
2000 – 2007: Senior Microbiologist and Section Manager, Applied Research Department
1994 – 2000: Associate Microbiologist, Applied Research Department
1992 – 1994: Assistant Microbiologist, Applied Research Department

SUMMARY:

In 2007, Brian Gallagher joined Water Quality & Treatment Solutions, Inc., as Senior Scientist. He has over 27 years of experience in water related bench and pilot scale treatment studies. Brian has designed and fabricated numerous pilot-scale conventional and advanced water treatment processes, including coagulation, flocculation, sedimentation, filtration, advanced oxidation, ion exchange, membrane filtration, membrane bio-film reactors (MBfR), and sequencing batch reactors. These pilot-scale units have been stand-alone single processes or fully-integrated treatment trains.

From 1992 to late 2007 Brian was a member and then section manager in the Applied Research Department of MWH, a global environmental engineering firm. In 2000, Brian assumed the role of manager for the Research Center and Fabrication Facility of MWH's Applied Research Department. In this position, he was responsible for overseeing and participating in the day to day operation of the laboratory research and pilot fabrication activities for the facility. During his tenure with MWH, Brian was responsible for the installation and commissioning of numerous pilot-scale unit processes in the US and around the world.

Brian's laboratory experience includes numerous investigations in the disinfection and removal of various microorganisms in water treatment including *Giardia* and *Cryptosporidium*. He has also conducted many bacteriophage challenge studies for membrane research and regulatory compliance. He is proficient in the propagation and enumeration of bacteriophages and was instrumental in the development of a method to use indigenous bacteriophages as a viable, rapid-result integrity monitor for reverse osmosis effluents. Brian has also managed and participated in investigations in water reclamation, residuals management, desalination and perchlorate removal from groundwater.

Mr. Gallagher also has a wide range of on-site field experince including: on site installation and decomisioning of pilot and demostration scale treatment equipment, staff training in operation and maintenance of pilot study equipent, assistance in full scale treament plant start up, full scale filtration media evaluations, and tacer testing of chlorine contactors, storage reservoirs and treatment trains for modal contact times and T_{10} determinations.

EXAMPLE PROJECTS:

Mr. Gallagher has been involved in dozens of national and international water quality and treatment bench and pilot scale projects throughout his career. A short list of representative projects with his tenure as Senior Scientist at WQTS is included below. References for these projects are available upon request.

Pilot Testing of Groundwater Treatment Alternatives
Suburban Water Systems, CA

WQTS is conducting pilot testing at three Suburban Water System groundwater wells to evaluate possible treatment alternatives to remove iron and manganese and reduce disinfection byproduct formation in the distribution system. Mr. Gallagher fabricated and installed the necessary pilot equipment for study evaluations at three ground water well sites.

Pilot Testing of Treatment Alternatives for Corrosion Control
City of Fresno, CA

WQTS conducted pilot-scale testing to evaluate the potential occurrence and mitigation of iron corrosion in the City's distribution system after the startup of a newly constructed water treatment plant. WQTS has been involved in the desktop study, pilot design and fabrication, and the current testing oversight. Mr. Gallagher designed and constructed a pipe-loop pilot unit with a corresponding chemical feed. The pipe-loop pilot was implemented at a water treatment facility to evaluate corrosion mitigation techniques with various pipe materials and home fixtures.

Evaluation of Chlorite Addition for Nitrification Prevention & Control
Los Angeles Department of Water and Power, CA

WQTS carried out a study investigating the applicability and efficiency of chlorite addition as a supplemental tool for nitrification control and prevention in the Los Angeles Department of Water & Power distribution system. Mr. Gallagher designed and fabricated the pilot testing unit and managed the daily operation of the equipment.

Evaluation of Cyanotoxins Removal/Destruction with Water Treatment Technologies
Zone 7 Water Agency, Livermore, California
Alameda County Water District, Fremont, California
Santa Clara Valley Water District, Santa Clara, California

The Zone 7 Water Agency, Alameda County Water District, and the Santa Clara Valley Water District treat water drawn from the Sacramento-San Joaquin Delta via the South Bay Aqueduct (SBA). The three agencies pooled resources and retained the services of WQTS to conduct bench-scale testing to evaluate the ability of each agency's treatment plant to remove and/or destroy cyanotoxins that could be generated by a future cyano-bacterial bloom in the Delta or the SBA. WQTS received raw SBA water, spiked it with four cyanotoxins, and evaluated their potential destruction with ozone and chlorine, as well as their removal with the addition of Powdered Activated Carbon (PAC). Mr. Gallagher was responsible for the bench scale experimental design and execution.

Evaluation of Waste Minimization Alternatives for Cr(VI) Treatment Systems
Water Research Foundation, Denver, Colorado

WQTS completed a research project jointly funded by the Water Research Foundation (WRF) and the California Water Service Company (CalWater) aimed at evaluating alternatives to reduce the waste production from three treatment technologies used for the removal of hexavalent chromium, Cr(VI), from water. Extensive bench-scale testing was conducted to evaluate the recovery and reuse of the brine solution from ion-exchange processes used for Cr(VI) removal that would otherwise have to be hauled off site for disposal. Mr. Gallagher was tasked with the design and fabrication of bench scale testing apparatus and operation.

PEER REVIEWED JOURNAL ARTICLES:

1. Gagliardo, P. ; Chambers, Y. ; Adham, S. ; Sobsey, M. ; **Gallagher, B.** ; Rhodes Trussell, R. "Using the coliphage naturally present in secondary effluent to monitor performance of a water repurification process in removing virus". *Water Supply*, Vol. 18, No. 1-2. pp. 450-455.(2000).
2. Najm, I.N.; E.M. Aieta; J.A. Oppenheimer; and **B.T. Gallagher**. "Impact of Turbidity on the Inactivation of *Giardia cysts* With Ozone". *Water Supply*, Vol. 16; Nos 1/2, pp. 419-442 (1998).

PEER REVIEWED RESEARCH REPORTS:

1. Najm, I.; Romero-Maraccini, O.; Maraccini, P.A.; Askenaizer, D**.; Gallagher, B.** *Cost-Effective Cr(VI) Residuals Management Strategies.* Water Research Foundation, Denver, CO. 2017.
2. Najm, I.N.; N.L. Patania-Brown; E.Y. Seo; **B.T. Gallagher**; K.M. Gramith; N. Blute; X. Wu; M. Yoo; S. Liang; S. Maceiko; S. Kader; & J. Lowry. *Impact of Water Quality on Hexavalent Chromium Removal Efficiency and Cost.* Final Report, Water Research Foundation, Denver, CO (2014)
3. Najm, I.N.; N.L. Patania-Brown; **B.T. Gallagher**; E.Y. Seo; & K.M. Gramith. *Minimizing Waste Backwash Water from a Biological Denitrification Treatment System.* Final Report, Water Research Foundation, Denver, CO (2014).

CONFERENCE PRESENTATIONS:

1. Romero-Maraccini, Ofelia, Najm, I., Askenaizer, D., **Gallagher, B.** Minimizing Waste Residuals from Cr(VI) Treatment Plants Using a Strong Base Anion (SBA) Resin. Paper presented at the AWWA Annual Conference & Exposition, Chicago, IL (2016)
2. Najm, I.N.; Romero-Maraccini, O.; **Gallagher, B.** & M. Paulucci, "Cyanotoxins & MIB Removal with Powdered Activated Carbon", In Proceedings of the AWWA California-Nevada Section Spring Conference, Sacramento, CA (2016).
3. Najm, I.N., **B.T. Gallagher**, M. Phillibert, J. Meyerhofer, R. Anderson, & S. Thomson. "A Novel Approach to Sulfide Removal from Groundwater", In Proceedings of the AWWA Annual Conference & Exposition, San Diego, California (2009).
4. Oppenheimer, J.A., M. Heath, **B.T. Gallagher**. "Impact of Chemical Disinfectant Residuals on UV Inactivation of Viruses", Paper presented at the AWWA Water Quality Technology Conference, Philadelphia, Pa (Nov., 2003)
5. Gagliardo, P. ; Chambers, Y. ; Adham, S. ; Sobsey, M. ; **Gallagher, B.** ; Rhodes Trussell, R. "Development of an Innovative Method to Monitor the Integrity of a Membrane Water Repurification System". Proceedings, AWWA Membrane Technology Conference, Long Beach, CA (March, 1999)
6. Najm, I.N.; R.R. Trussell; L. Boulos; **B. Gallagher**; R. Bowcock; C. Williams; and D. Clifford. "Application of Ion-Exchange Technology for Perchlorate Removal from Drinking Water," Paper presented at the AWWA Annual Conference, Chicago, IL (June, 1999)
7. Najm, I.N., E.M. Aieta, J.A. Oppenheimer, **B.T. Gallagher**. "Impact of Natural Water Quality on the Inactivation of *Giardia* With Ozone," Paper presented at IWSA Conference, Madrid, Spain (September, 1997).