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## Kirk O'Reilly, Ph.D., J.D.

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### Professional Profile

Dr. O'Reilly has more than 25 years of experience developing strategic approaches for managing liabilities associated with both large and small contaminated sites. He has provided litigation support in toxic tort and property damage suits, and supported apportionment and allocation efforts at Superfund sites. Dr. O'Reilly has authored a number of papers focused on ensuring proper integration of chemistry into mathematical models used to quantify source contributions, and has conducted technical training on apportionment through Bar associations and other venues.

Dr. O'Reilly has assisted clients deal with the technical complexities of RCRA, CERCLA, the NPDES process, and state groundwater protection programs, and assisted the State of Kuwait to update its waste and wastewater regulatory systems. Based on an understanding of the evolution of site remediation programs and the uncertainties in risk evaluations, he has worked with clients and regulators to consider risk management approaches that are more cost effective than traditional remediation. To further this effort, Dr O'Reilly has assisted trade groups such as the API, WSPA, and PCTC develop the technical justification for regulatory modifications and has presented the results in peer reviewed journals, legislative hearing, and Information Quality Act requests.

Having spent 15 years as a technical specialist with major oil company, Dr. O'Reilly understands the client's perspective. In that position, he was involved in the early implementation of monitored natural attenuation and played a significant role in developing the oil industry's technical response to managing MTBE in the environment. Dr O'Reilly has experience with oil spill and has responded to spills of both crude oil and refined products, and served as an on-site liaison to environmental regulators.

Dr. O'Reilly promotes the use of strategic site assessments to reduce costs while improving quality. A recent focus has been the development of computer tools to evaluate large databases, such as California's GeoTracker, to improve our understanding of the fate of contaminants in the environment and reduce the need for long term monitoring. Dr O'Reilly has participated in collaborative research projects with regulators at the federal, state, and local levels, and taught technical courses sponsored by regulatory agencies, universities, and industrial trade groups. He is a member of the Washington State Bar, a Fellow of the American Bar Foundation, and former chair of ABA's Superfund and Natural Resource Damages Litigation Committee.

### Academic Credentials & Professional Honors

J.D., University of Idaho, *magna cum laude*, 2007

Ph.D., Biochemistry, University of Idaho, 1989

M.S., Biology, Portland State University, 1985

B.S., Biology, University of California, Irvine, 1980

## Licenses and Certifications

Washington State Bar, #39473

## Prior Experience

Senior Environmental Specialist, Chevron Energy Technology Company, 1989-2007

## Professional Affiliations

American Bar Association

American Chemical Society

Fellows of the American Bar Foundation

Society of Environmental Toxicology and Chemistry

## Patents

Patent 6,924,404: Inhibition of Biological Degradation of Fischer-Tropsch Products, 2005 (with M. Moir and D. O'Rear).

Patent 6,849,664: Process for Disposing Biocidecontaining Cooling Water, 2005 (with M. Moir, D. O'Rear, and R. Moore).

Patent 6,800,101: Deactivatable Biocides for hydrocarbonaceous Products, 2004 (with M. Moir and D. O'Rear).

Patent 6,626,122: Deactivatable biocides in Ballast Water, 2003 (with M. Moir, D. O'Rear, M. Buetzow, M. Dorsch, and V. Brian).

Patent 6,569,909: Inhibition of Biological Degradation in Fischer-Tropsch products, 2003 (with M. Moir and D. O'Rear).

Patent 5,236,594: Process for removing toxicants from aqueous petroleum waste streams, 1993 (with J. Suzuki).

## Publications

O'Reilly KT, Ahn S. Comment on "Primary sources and toxicity of PAHs in Milwaukee-area streambed sediment". Environmental Chemistry and Toxicology 2017. DOI: 10.1002/etc.3825.

Zemo DA, O'Reilly KT, Mohler RE, Magaw RI, Espino Devine C, Sungwoo A, Tiwary AK. Life Cycle of Petroleum Biodegradation Metabolite Plumes, and Implications for Risk Management at Fuel Release Sites. Integrated Environmental Assessment and Management 2016, 3:714-727.

O'Reilly, K, Espino-Devine C, Sihota, N, North, K. An empirical evaluation of the influence of ethanol on natural attenuation of dissolved gasoline constituents. Ground Water Monitoring & Remediation 2016; 36:62-72.

Zemo, D., O'Reilly, K. 2016. On the Basis for the 0.1 mg/L Water Quality Objective for "Taste and Odor" for Diesel in Groundwater. *Ground Water Monitoring & Remediation* 2016; 36:88-90.

O'Reilly, K.T, Ahn, S.; Zemo D.A.; Mohler R.E.; Tiwary A.K.; Magaw R.I.; Devine C.E.; Synowiec KA. Identification of ester metabolites from petroleum hydrocarbon biodegradation in groundwater using GCxGC-TOFMS. *Environmental Chemistry and Toxicology* 2015; 34: 1959-1961.

Mesard PM, Sparacio T, O'Reilly KT. The states' perspective on cost allocation. *ABA Superfund and NRD Litigation Committee Newsletter* 2015; 10(3):10-12.

Mesard PM, Sparacio T, O'Reilly KT. Criteria for allocation of responsibility under state law. *Environmental Claims Journal* 2015; 27:40-49.

O'Reilly KT, Ahn S, Pietari J, Boehm P. Use of receptor models to evaluate sources of PAHs in sediments. *Polycyclic Aromatic Compounds*. 2015; 35:41-56.

O'Reilly KT, Pietari J, Boehm P. Parsing Pyrogenic PAHs: Forensic Chemistry, Receptor Models, and Source Control Policy. *Integrated Environmental Assessment and Management* 2014; 10:279-285.

O'Reilly, KT, Pietari, J, Boehm PD. Author's reply to Crane. *Integrated Environmental Assessment and Management* 2014; 10:325-326.

O'Reilly, KT; Pietari, J.; Boehm, P. D. Author's reply to Van Metre and Mahler. *Integrated Environmental Assessment and Management* 2014; 10:89-491.

O'Reilly KT. Article title misstates the role of pavement sealers. *Environmental Pollution* 2014; 191:260-261.

O'Reilly KT. Reply to letter on "Coal-tar-based sealcoated pavement: A major PAH source to urban stream sediments." *Environmental Pollution* 2014; 191:262-263.

O'Reilly KT. Response to authors' reply on "Coal-tar-based sealcoated pavement: A major PAH source to urban stream sediments." *Environmental Pollution* 2014; 191:264-265.

O'Reilly KT. Understanding the limitations of technical evidence. *ABA Superfund and NRD Litigation Committee Newsletter* 2014; 9(1):21-22.

O'Reilly KT. Pietari J, Boehm PD. Author's reply. *Integrated Environmental Assessment and Management* 2014; 10:325-326.

Mohler RE, O'Reilly KT, Zemo DA, Tiwary AK, Magaw RI, Synowiec KA. Non-targeted analysis of petroleum metabolites in groundwater using GCxGC-TOFMS. *Environmental Science and Technology* 2013; 47(18):10471-10476.

Zemo DA, O'Reilly KT, Mohler RE, Tiwary AK, Magaw RI, Synowiec KA. Nature and estimated human toxicity of polar metabolite mixtures in groundwater quantified as TPHd/DRO at biodegrading fuel release sites. *Groundwater Monitoring & Remediation* 2013, 33(4): 44-56.

O'Reilly KT, Pietari J, Boehm PD. A forensic assessment of coal tar sealants as a source of polycyclic aromatic hydrocarbons in urban sediments. *Environmental Forensics* 2012; 13(2):185-196.

Brugger G, O'Reilly KT. Chlorinated solvents, leaking sewers, and CERCLA liability. *ABA Superfund and NRD Litigation Committee Newsletter* 2012; 7(3)10-13.

O'Reilly KT, Vapor intrusion and CERCLA's hazardous ranking system. *ABA Superfund and NRD*

Litigation Committee Newsletter 2012; 7(2)15-17.

O'Reilly KT, Pietari J, Boehm PD. Comment on "PAHs Underfoot: Contaminated Dust from Coal-Tar Sealcoated Pavement is Widespread in the U.S." *Environmental Science Technology* 2011; 45(7):3185-3186.

O'Reilly K, Thorsen, W. Impact of crude oil weathering on the calculated effective solubility of aromatic compounds: Evaluation of soils from Ecuadorian oil fields. *Soil Sediment Contamination- International Journal* 2010; 19:391-404.

O'Reilly K. Restatement Section 433A and the chemistry of divisibility. *ABA Superfund and Natural Resource Damages Litigation Committee Newsletter* 2010; 5(1).

Chunn Lindsay J, O'Reilly K, Kaetzel R, Roberts M. Limitations of toxicogenomic studies to assess toxic exposures and injury from benzene. *ABA Toxic Torts and Environmental Newsletter*, Fall 2009.

O'Reilly K. Science, policy, and politics: The impact of the Information Quality Act on risk-based regulatory activity at the EPA. *Buffalo Environmental Law Journal* 2007; 14:249-288.

Johnson EL, Smith CA, O'Reilly KT, Hyman MR. Induction of methyl tertiary butyl ether (MTBE)-oxidizing activity in *Mycobacterium vaccae* JOB5 by MTBE during cell growth on diverse substrates. *Applied Environmental Microbiology* 2004; 70:1023-1030.

Smith CA, O'Reilly KT, Hyman MR. Cometabolism of methyl tertiary butyl ether (MTBE) and gaseous n-alkanes by *Pseudomonas mendocina* KR-1 grown on C5-C8 n-alkanes. *Applied Environmental Microbiology* 2003; 69:7385-7394.

Smith C, O'Reilly K, Hyman M. Characterization of the initial reactions during the cometabolic oxidation of methyl tertiary butyl ether (MTBE) by propane-grown *Mycobacterium vaccae* JOB5. *Applied Environmental Microbiology* 2003; 69:796-804.

Ruiz-Aguilar GM, O'Reilly K, Alvarez PJ. A comparison of benzene and toluene plume lengths for sites contaminated with regular vs. ethanol-amended gasoline. *Groundwater Monitoring & Remediation* 2003; 23:48-53.

O'Reilly K, Moir M, Taylor C, Smith C, Hyman M. Hydrolysis of tert-butyl methyl ether (MTBE) in dilute aqueous acids. *Environmental Science and Technology* 2001; 35:3954-3961.

Schroth M, Istok J, Conner G, Hyman M, Haggerty R O'Reilly K. Spatial variability in in-situ aerobic respiration and denitrification rates in a petroleum contaminated aquifer. *Ground Water* 1998; 36(6):924-937.

Donaldson J, Istok J, O'Reilly K. Dissolved gas transport in the presence of a trapped gas phase: Experimental evaluation of a two-dimensional kinetic model. *Ground Water* 1998; 36(1):133-142.

Istok J, Humphrey J, Schroth M, Hyman M, O'Reilly K Single well, "push-pull" tests for in-situ determination of microbial metabolic activity. *Ground Water* 1997; 35(4):619-631.

Donaldson J, Istok J, Humphrey M, O'Reilly K, Hawelka C, Mohr D. Development and laboratory testing of a kinetic model for dissolved oxygen partitioning and transport in porous media in the presence of trapped gas. *Ground Water* 1997; 35(2):270-279.

Fry V, Istok J, O'Reilly K. Effect of trapped gas on dissolved oxygen transport — Implications for in situ bioremediation. *Ground Water* 1996; 34(2):200-210.

Fry V, Istok J, Sempini L, O'Reilly K, Buscheck T. Retardation of dissolved oxygen due to a trapped gas phase in a porous media. *Ground Water* 1995; 33(3):391-399.

O'Reilly K, Crawford R. Degradation of pentachlorophenol by polyurethane-immobilized *Flavobacterium* cells. *Applied Environmental Microbiology* 1989; 55:2113-2118.

O'Reilly K, Crawford R. Kinetics of p-Cresol degradation by an immobilized-*Pseudomonas* sp. *Applied Environmental Microbiology* 1989; 55:866-870.

O'Reilly K, Kadakia R, Korus R, Crawford R. Utilization of immobilized bacteria to degrade aromatic compounds common to wood treatment wastewater. *Water Science Technology* 1988; 29:95-100.

Rueter R, O'Reilly K, Petersen R. Indirect aluminum toxicity to the green alga *Scenedesmus* through increased cupric ion activity. *Environmental Science and Technology* 1987; 21:435-438.

## Project Experience

Environmental forensics and contaminant source identification- multiple sites.

CERCLA apportionment and allocation - complex multi-party sites.

Assisting the State of Kuwaiti modernize its waste and wastewater regulatory systems.

Consulting expert for current and former oil and gas production site litigation in Louisiana, Texas and Africa.

Provided testimony to legislative committees and administrative boards on a range of technical issues.

Product risk evaluation and regulatory negotiations - oxygenates, biodegradable plastics, pavement sealants.

Negotiation of multiple site NPDES general permits with EPA (offshore platforms) and State regulators (emerging contaminants).

Developed Information Quality Act and Freedom of Information submissions.

Assisted a client defend its product against proposed bans by identifying technical flaws in research conducted by government agencies.

Provided technical training to regulators, lawyers and consultants through agency-sponsored workshops, professional conferences, continuing legal education and university extension programs.

Oil spill response - corporate oil spill response team member, incident command system and response experience - Gulf of Mexico, crude pipeline in an agricultural area, gasoline pipeline in wetlands, refinery shoreline.

Led industrial trade group efforts evaluating environmental impacts of oxygenates - MTBE, ETBE, TBA, ethanol.

Manager of water and solid waste issues for offshore oil platforms - California.

Managing risk of oil impacted soil in developing countries - Africa, Asia, and South America.

Remedial system development and implementation for soil, sediments, and groundwater- PAHs, petroleum, oxygenates, pentachlorophenol, agricultural chemicals.

Strategic site assessment development and application - petroleum and chemical sites.

Develop site assessment and remediation guidance for trade groups and industrial clients.

Chemical aspects of contaminant fate and transport.

Developed and applied computer tools for evaluating state wide and mega site environmental data bases.

Biodegradation and bioremediation consulting.

Industrial whole effluent toxicity assessment and wastewater treatment.

Patented an environmentally sensitive biocide for preserving specialized petrochemical feed stocks.

Collaborated with the Department of Energy to retrain Russian biological warfare scientists to engage in environmental research.

Evaluated the impact of the Information Quality Act on risk-based regulatory activity of the USEPA.

Chair the ABA Superfund and NRD Litigation Committee.

Served on advisory boards of EPA funded multiple university research programs.