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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., Law, University of Idaho, 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

Bar Association Member (WA)

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, Athanasiou D, Edwards M. Evaluation of Generic PAH Profiles Commonly Used in Receptor Models: Implications for Source Control Policy. Environmental Forensics. 2023: DOI:10.1080/15275922.2023.2172094

Zemo DA, Patterson TJ, Kristofco L, Mohler RE, O'Reilly KT, Ahn S, Devine CE, Magaw RI, Sihota N. Complex mixture toxicology: Evaluation of toxicity to freshwater aquatic receptors from biodegradation metabolites in groundwater at a crude oil release site, recent analogous results from other authors, and implications for risk management. Aquatic Toxicology. 2022; 250:106247.

O'Reilly KT, Sihota N, Mohler RE, Ahn S, Zemo DA, Magaw RI, Espino Devine C. Orbitrap ESI-MS

Evaluation of Solvent Extractable Organics from a Crude Oil Release Site. Journal of Contaminant Hydrogeology 2021; 242:103855.

O'Reilly, K, Lahvis, MA, DeVaull, GE, Deines, AM. A Comparative Plume Study of DRO, GRO, Benzene, and MTBE: Implications for Risk Management. Ground Water Monitoring & Remediation 2021; 41:58-64.

Pietari, P, O'Reilly, K, Shea, D, Kamath, R. Incorporating Oil / Water Partitioning in Risk Calculations for PAHs in Petroleum Impacted Soils and Sediments, Soil and Sediment Contamination: An International Journal, 2021; 31:1, 115-132.

O'Reilly, KT, Edwards, M. Comment on Norris and Henry (2019). Science of the Total Environment. 2020; 704:135248.

Mohler RE, Ahn S, O'Reilly KT, Zemo DA, Magaw RI, Espino Devine C. Towards Comprehensive Analysis of Oxygen Containing Organic Compounds in Groundwater at a Crude Oil Spill Using GC×GC-TOFMS and Orbitrap ESI-MS. Chemosphere, 2020; 244:125504

Patterson TJ ,Kristofco L, Tiwary AK, Magaw RI, Zemo DA, O'Reilly KT, Mohler R.E.: Ahn S, Sihota N, Espino-Devine C. Human and Aquatic Toxicity Potential of Petroleum Biodegradation Metabolite Mixtures in Groundwater from Fuel Release Sites. Environ. Tox. Chem. 2020, 39:1634-1645

O'Reilly, K, Mohler RE, Zemo DA Ahn, S, Magaw RI, Espino Devine C. Oxygen-containing compounds identified in groundwater from fuel release sites using GCxGC-TOF-MS. Ground Water Monitoring & Remediation 2019; 39:32-40.

O'Reilly K, Ahn S. Letter commenting on "Primary sources and toxicity of PAHs in Milwaukee-area streambed sediment"-To the editor. Environ Toxicol Chem. 2017 36:1978-1980.

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 2017, 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, KT, Ahn; S.; Zemo DA, Mohler RE, Tiwary AK, Magaw RI, Espino-Devine C, Synowiec KA. Identification of ester metabolites from petroleum hydrocarbon biodegradation in groundwater using GCxGC-TOFMS. Environmental Chemistry and Toxicology 2015; 34: 1959–1961.

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

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, 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. 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 GC×GC–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; 13:185−196.

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; 45:3185–3186.

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.

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.

O'Reilly K, Magaw R. Hydrocarbon transport from oil and soil to groundwater. pp. 132-141. In: Risk-Based Decision-Making for Assessing Petroleum Impacts at Exploration and Production Sites. U.S. Department of Energy, 2001.

Spence L, O'Reilly K, Magaw R, and Rixey W. Predicting the fate and transport of hydrocarbons in soil and groundwater. pp. 89-110. In: Risk-Based Decision-Making for Assessing Petroleum Impacts at Exploration and Production Sites. U.S. Department of Energy, 2001.

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.

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.