

**Jaana Pietari, Ph.D.**  
**Senior Scientist**

**Professional Profile**

Dr. Jaana Pietari is a Senior Scientist in Exponent's Environmental Sciences practice. Dr. Pietari's expertise is in the fate and biological treatment of chlorinated compounds including tetrachloroethene (PCE) and pentachlorophenol (PCP), the analytical chemistry of polychlorinated biphenyls (PCBs), and biological water and wastewater treatment. In addition to environmental consulting experience, she has more than 10 years of experience conducting environmental engineering and science research in academic and regulatory settings.

Dr. Pietari has conducted pilot plant studies on the applicability of biological activated carbon (BAC) filtration to improve the quality of drinking water from cold surface waters. Further, she has investigated reductive dechlorination of PCE at low temperature, employing molecular biology tools in combination with analytical chemical techniques, to better understand the changes in a microbial community during initial phases of PCE dechlorination. She has also characterized an enzyme that is the bottleneck in aerobic PCP degradation pathway, and determined the underlying reasons based on the PCP degradation kinetics. Most recently, she planned and conducted an inter-laboratory comparison project on mass spectrometric analytical techniques for measuring PCB congeners in sediment samples, and developed standard operating procedures for the analysis of PCB congeners.

Dr. Pietari has also experience preparing sampling and analysis plans for sediment remediation projects, developing risk-based cleanup levels for a complex industrial contaminated site, and providing general technical and litigation support.

**Academic Credentials and Professional Honors**

Ph.D., Environmental Engineering and Science, University of Washington, Seattle, 2002  
M.S.E., Environmental Engineering and Science, University of Washington, Seattle, 1999  
M.S.E., Environmental Biotechnology, Tampere University of Technology, Finland, 1996

**Licenses and Certifications**

Engineer in Training, Washington, #28659  
OSHA 40-hour HAZWOPER Certification

## Languages

Finnish, French, Swedish

## Publications

Gu AZ, Stensel HD, Pietari JMH, Strand SE. Vinyl bromide as a surrogate for determining vinyl chloride reductive dechlorination potential. *Environ Sci Technol* 2003; 37:4410–4416.

Ferguson JF, Pietari JMH. Anaerobic transformations and bioremediation of chlorinated solvents. *Environ Pollut* 2000; 107:209–215.

## Published Abstracts

Pietari J, Whipple W. Interlaboratory comparison study of measurement of polychlorinated biphenyl (PCB) congeners from sediment samples with high resolution (HRMS) and low resolution mass spectrometry (LRMS). Proceedings, National Environmental Monitoring Conference, pp. 37–40, Washington, DC, 2008.

## Presentations

Whipple WJ, Wroble A, Pietari J. Interlaboratory comparison study of the measurement of Polychlorinated Biphenyl (PCB) congeners from sediment samples with High Resolution (HRMS) and Low Resolution Mass Spectrometry (LRMS). PITTCON Conference & Expo, Orlando, FL February 28–March 5, 2010.

Whipple W, Pietari J, Wroble A. Interlaboratory study of polychlorinated biphenyl congeners from sediment samples with high-resolution and low-resolution mass spectrometry. The Annual International Conference on Soils, Sediments, Water and Energy, University of Massachusetts, Amherst, MA, October 19–22, 2009.

Pietari JMH, Bigam G. Recent advances in microbial source tracking methods for environmental forensic evaluation of fecal pollution. International Network of Environmental Forensics Conference, Calgary, Alberta, Canada, August 31–September 2, 2009.

Wroble A, Pietari J, O'Keefe J, Hamlett PP, Santacroce G, Oliveira T, Wilding S, Revell D, Whipple W. Interlaboratory comparison study of measurement of polychlorinated biphenyl (PCB) congeners from sediment samples with high resolution (HRMS) and low resolution mass spectrometry (LRMS). 238th ACS National Meeting, Washington, DC, August 16–20, 2009.

O'Reilly K, Pietari J, Thorsen W, Hoelen T. Using decision support tools to evaluate TPH field test kits. 19th Annual AEHS West Coast Conference on Soils, Sediments, and Water, San Diego, CA, March 11, 2009.

Pietari J, Wroble A, Whipple WJ. Interlaboratory comparison study of measurement of polychlorinated biphenyl (PCB) congeners from sediment samples with high resolution

(HRMS) and low resolution mass spectrometry (LRMS). National Environmental Monitoring Conference, Washington DC, August 10–16, 2008.

Pietari J, Whipple W. Interlaboratory comparison of performance based methods for PCB congener analysis from sediments. Oral presentation, US EPA Laboratory Technical Information Group Meeting Denver, CO, April 7–11, 2008.

Pietari J, Whipple W. PCB method development work in Region 5. Poster presentation, US EPA Laboratory Technical Information Group Meeting, Chicago, IL, May 1–3, 2007.

Pietari JMH, Herwig RP, Ferguson JF. Enrichment and characterization of PCE or cDCE dechlorinating microcosms with T-RFLP and PCR. Poster presentation, Superfund Basic Research Program Annual Meeting, Tucson, AZ, November 3-6, 2002.

Pietari JMH, Herwig RP, Ferguson JF. Characterization of a microaerophilic and psychrotrophic tetrachloroethene to cis-1,2-dichloroethene dechlorinating bacterium, strain JPD-1. Poster presentation, 102<sup>nd</sup> General meeting, American Society for Microbiology, Salt Lake City, UT, May 19–23.

Pietari JMH, Herwig RP, Ferguson JF. Characterization of tetrachloroethene (PCE) and cis-1,2-dichloroethene (cDCE) dechlorinating cultures with terminal restriction fragment length polymorphism (T-RFLP) analysis. Poster presentation, 6<sup>th</sup> International Symposium, In Situ and On-Site Bioremediation, San Diego, CA, June 4–7, 2001.

Vuoriranta P, Pietari J, Soini S, Salkinoja-Salonen M, Puhakka J. Biological activated carbon filtration of drinking water: Effects of ozonation and temperature on NOM removal. Poster presentation, 4<sup>th</sup> International Symposium on Environmental Biotechnology, Noordwijkerhout, the Netherlands, April 10–12, 2000.

Pietari JMH, Herwig RP, McLarnan JL, Ferguson JF. Characterization of an anaerobic PCE or TCE to cis-1,2-DCE dechlorinating psychrotrophic enrichment. Poster presentation, 99<sup>th</sup> General Meeting, American Society for Microbiology, Chicago, IL, May 30–June 3, 1999.

Pietari JMH, Ferguson JF. Characterization of a psychrotrophic TCE dechlorinating culture and comparison with a mesophilic culture. Oral presentation, 5<sup>th</sup> International Symposium, In Situ and On-Site Bioremediation, San Diego, CA, April 19–22, 1999.

### **Prior Experience**

Chemist Postdoctoral Fellow, U.S. EPA Region 5, 2007–2008  
Research Scientist, CIRES, University of Colorado, 2005–2006  
Project Scientist, Floyd Snider Inc., 2002–2003

## **Project Experience**

### *Chlorinated Organics*

Assisted with PCB fingerprinting using PCB congener and homolog data in principal component analysis to identify potential sources of PCBs into a large, industrialized urban Bay. In addition to the analyses, assisted in report preparation.

Evaluated PCB issues associated with a paper sludge landfill near a mid-western lake. Evaluated the potential pathways and landfill management practices that could have impacted the release of PCBs into the lake. Assisted in preparation of expert and rebuttal reports.

Evaluated the fate of a PCB-containing transformer oil spill into a river. Applied environmental forensic techniques to evaluate the persistence of the mineral oil in the river and the fate of the PCBs in the vicinity and downstream of the spill.

Provided expertise on the use of PCBs in non-liquid applications for a project that investigated the use of PCBs in Navy operations during World Wars I and II.

### *Petroleum and Polycyclic Aromatic Hydrocarbons*

Managed a project evaluating the application of a variety of field test kits for remediation of contaminated sites. The goal was to investigate whether field test kits produce effective data that can support decisions during a remediation project. The project involved laboratory studies in collaboration with a university.

Employed various decision support tools, such as spatial analysis and decision assistance (SADA) and ProUCL software to re-evaluate results of EPA's TPH field test kit demonstration project to assess whether the field test kits supported the correct decisions. The application of the decision support tools demonstrated that TPH field test kits can produce effective data supporting the decisions required to remediate a contaminated site and suggested suitable test kits for a subsequent laboratory assessment.

Investigated the impact of a petroleum transfer facility's operations on adjacent river sediments by application of a variety of environmental forensic techniques. This project involved sediment sampling, coordination with the analytical laboratory, and data analysis of PAH, biomarker, and TPH data.

### *Degradable Polymers and Wastewater Treatment*

Calculated the CO<sub>2</sub> footprint of an industrial waste treatment process for garments made of polyvinylalcohol (PVA) polymers by dissolution using hydrogen peroxide and heat.

Performed a third-party evaluation of the environmental transport, fate, and toxicities of degradation products of biodegradable and compostable plastics. Modeled environmental fate properties of various monomers with the EPI Suite™ program.

Provided expertise and prepared an affidavit in determining whether effluent from a wastewater pretreatment process would inhibit nitrification in a POTW.

### *Inorganics*

Assisted in preparation of white papers regarding the environmental fate and environmental and human health toxicity of arsenic and selenium in coal ash. Specifically, was responsible for the section on the chemistry and leaching characteristics of coal and coal ash.

Assisted in evaluation of the environmental impact of hospital incinerator bottom ash to a municipal solid waste landfill. Determined the effect of the ash to the pH of the leachate in the landfill, in addition to determining the effect of the ash on methane production and dechlorination of TCE.

### *Other*

Managed and conducted an inter-laboratory comparison study on analytical methods using mass spectrometry for PCB congener analysis. The goal of the study was to provide new analytical tools that would be cost effective and appropriate given individual project objectives. Further, developed analytical methods for PCB congener analysis using gas chromatography and low-resolution mass spectrometry using different ionization methods.

Evaluated contamination with pesticide Dinoseb in a former Superfund site. Investigated nature and extent of contamination. Designed and supervised a creation of a database containing chemical analysis results that were obtained by various entities.

Performed risk assessment for determination of cleanup levels for upland areas for a complex industrial site with groundwater discharge to a waterway. In addition, critically reviewed equations for risk-based cleanup values to aid in negotiation of clean-up levels.

Prepared a sampling and a chemical analysis plan for a sediment sampling event for a client in Portland Harbor. The client's objective was to obtain preliminary data on the sediment quality in support of sediment cleanup decisions. Coordinated with the analytical laboratory for the analysis of the samples, validated the data, and prepared a final report for the sampling event.

For Portland Harbor client, prepared a regulatory trend analysis report for strategic planning for sediment cleanup. The client's objective was to analyze how Portland Harbor's Superfund listing would impact their sediment cleanup efforts and maintenance dredging plans.

## **Peer Reviewer**

- Environmental Science and Technology
- Environmental Toxicology and Chemistry
- Journal of Environmental Engineering and Science
- Environmental Forensics

## **Professional Affiliations**

- American Chemical Society
- Water Environment Federation
- Pacific Northwest Clean Water Association