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# Tian Tang, Ph.D.

## Sr. Environmental Engineer

Dr. Tang is an environmental engineer with expertise in contaminant fate and transport, numerical modeling, and groundwater hydrology. She has provided expertise on numerous projects, including contaminant fate and transport, environmental cost allocations, and site characterizations. She has a strong background in numerical modeling related to fate and transport of chlorinated solvents, spill and infiltration of NAPLs, and soil erosion. She has worked on projects involving a wide variety of contaminants, including per- and polyfluoroalkyl substances (PFAS), chlorinated solvents, polychlorinated biphenyls (PCBs), hydrocarbons, and metals.

Prior to joining Gradient, Dr. Tang completed her doctoral research at Tufts University, where she developed mathematical methods to quantify uncertainties for source zone characterization and down-gradient concentration prediction, conduct data-worth analysis, and design optimal field sampling strategy.

## Areas of Expertise

- Contaminant Fate & Transport
- Numerical Modeling
- Nonaqueous Phase Liquid (NAPL) Remediation Investigation & Design
- Uncertainty Quantification
- Sensitivity Analysis
- Hydrogeology
- Multiphase Flow & Reactive Transport

## Services

- Chemistry/Forensics
- Chemical Fate & Transport
- Remedial Strategies
- Water Resources

## Education

- Ph.D., Environmental Engineering, Tufts University
- M.S., Hydrology and Water Resources, Nanjing University, China
- B.S., Hydrology and Water Resources, Nanjing University, China

## Selected Projects

**Fate and Transport of Emerging Contaminants:** Gathered, reviewed, and analyzed PFAS data to identify potential source locations, evaluate contaminant plume evolution, and estimate potential impact on surface water, groundwater, fish, sediment, soil, and public and private water supply systems for several cases. Reviewed and analyzed regional and site-specific geology and hydrogeology information to better understand the potential fate and transport of certain PFAS chemicals.

**Superfund Site Cost Allocation:** Analyzed past costs allegedly incurred at a Superfund site in New Jersey. Analysis included the review of invoices, environmental reserve tables, and insurance settlement proceeds to summarize the net past environmental response and legal defense costs incurred for different time periods.

**Contaminant Source Identification:** Reviewed reports and databases from US EPA and state environmental/ecology websites to investigate the historical use and potential sources of PCBs in different claimed water bodies; assess PCB concentrations in water and sediment according to water body features; and identify upland PCB sites based on categories of release, discharger, user, and disposal. The results served as guidance for identifying the actions that caused PCB discharges and/or presence within the watersheds.

**Contaminant Transport Modeling:** Performed groundwater flow and solute transport modeling in both unsaturated and saturated zones using Visual MODFLOW and HYDRUS to evaluate potential impact of sulfate, boron, and arsenic from multiple coal ash surface impoundments to groundwater.

**Contaminant Fate and Transport Modeling:** Performed NAPL release and spreading numerical simulations under different scenarios using HSSM to assess NAPL lens sizes. The results were used to evaluate proposed cost allocation between oil and gas parties at a former refinery.

## Selected Publications and Presentations

**Tang, T;** Arshadi, M; Miller, E; Abriola, L. 2018. "Optimal Sampling Design for Down-gradient Flux Averaged Concentration Prediction and Uncertainty Reduction." Presented at the Interpore 10th Annual Meeting, New Orleans, LA, May 14-17.

**Tang, T;** Arshadi, M; Yang, L; Abriola, L; Cápiro, N; Christ J; Miller, E; Pennell, K. 2017. "Source Zone Characterization Methods and Tools Development; Sensitivity Analysis and Uncertainty Quantification." Presented at the SERDP and ESTCP Symposium, Washington, DC, November 28.

Wu, J; Lu, L; **Tang, T.** 2011. "Bayesian analysis for uncertainty and risk in a groundwater numerical model's predictions." *Hum. Ecol. Risk Assess.* 17(6):1310-1331.

**Tang, T;** Wu, J; Yang, Y. 2011. "Analysis of the impact of aquifer heterogeneity simplification to groundwater numerical predictions." *J. Geotech. Eng.* 158(4):34-42.