

Heather Fields
Supervising Environmental Scientist
Waterstone Environmental, Inc.

Ms. Fields is a Supervising Environmental Scientist at Waterstone Environmental and has been involved in the environmental industry since joining Waterstone in 2007. Her primary responsibilities include due diligence research and reporting, implementation and management of environmental site assessments, design and management of remediation projects, and litigation support. Ms. Fields has conducted work for numerous commercial and industrial properties both in the private sector and under the oversight of local and federal agencies, with the goal of working towards site closure. The majority of her responsibilities have included preparing and implementing sampling workplans and remediation approaches for soil, soil vapor, indoor air, and groundwater.

Ms. Fields is experienced in pre-field planning of numerous types of investigation activities; including preparing characterization and remediation workplans, preparing project proposals and budgets, procuring permits, working with laboratories performing analytical testing, and coordinating with drilling and construction subcontractors. Ms. Fields has extensive experience involving soil sampling, groundwater monitoring well installation and sampling, soil vapor well installation and sampling, indoor and outdoor air sampling, and oversight of an assortment of crews in relation to hand augering, grading, hollow stem drill rigs, direct push drill rigs, and Cone Penetrometer (CPT) units. In addition to executing the fieldwork, Ms. Fields is experienced in data management and evaluation, soil logging and preparation of geologic soil borings, preparation of figures and cross-sections, report preparation, interpretation of regulatory framework to work towards site closure, and interfacing with environmental agencies.

Education

- B.S. Earth Sciences, Minor in Environmental Studies, California Polytechnic State University, San Luis Obispo, CA, 2006, graduated *summa cum laude*.
- Environmental Management Certificate, University of California-Irvine, Irvine, CA, 2009.
- Geologist In Training (G.I.T.) Certificate #1281.

Specialized Training and Certifications

- OSHA 40-HR HAZWOPER Training, 2007-Current
- First Aid Training, 2007-Current

Project Capabilities

- Due diligence and ASTM-compliant Phase I Environmental Site Assessments (ESAs)
- Installation and sampling of groundwater monitoring wells and soil vapor wells
- Soil sampling, logging, and electronic boring log preparation
- Indoor air sampling and building surveys
- Soil remediation oversight and sampling, including Rule 1166 monitoring

- Installation and O&M of remediation extraction systems
- Hazardous waste management and disposal profiling
- Preparation of Phase I, Phase II, Remedial Action Workplan, and Remedial Action Completion Reports
- Regulatory research and guidance
- Computer-aided drafting and modeling programs
- Data management and processing
- Project management and budget tracking
- Litigation support

Key Projects and Experience

Environmental Site Assessments

- Ms. Fields has conducted numerous diligence investigations and E1527-21 ASTM-compliant Phase I Environmental Site Assessments at residential, commercial, industrial, and oil field properties throughout California and other states for a variety of clients; including banks, land development companies, local government, and local school districts. Each of these projects required research of the potential environmental concerns at the property and adjacent properties, conducting file reviews at local agencies, conducting site visits and performing interviews, review of historical aerial photographs and maps, evaluation of previous environmental reports, and preparation of a report that identifies and summarizes the potential for environmental impact to the property, as well as provide recommendations for further evaluation.
- Ms. Fields participated in the identification and research for a historical database of potential lead emitting industries located within a defined search radius of a closed battery recycling facility. Ms. Fields conducted extensive historical research at multiple properties to identify the regional contribution to aerially-deposited lead to provide multiple lines of evidence for the widespread responsibility for the presence of lead identified in nearby residential areas.
- Ms. Fields directed characterization sampling and preparation of a PEA-equivalent report under the oversight of the Department of Toxic Substances Control (DTSC) for a new development project in Rialto, California with historic underground storage tanks and vehicle repair activities. Previous sampling conducted by a prior consultant at the property had identified PCE in soil vapor which could not be reproduced in multiple subsequent sampling episodes, so working with DTSC, Ms. Fields successfully removed PCE as a primary contaminant of concern for the property. A Human Health Screening Evaluation was prepared for the site to evaluate petroleum-hydrocarbons identified at depth from a historic tank release and the site was granted No Further Action with a Land Use Covenant for future commercial usage.

Site Characterization and Fieldwork Capabilities

- Ms. Fields has designed, conducted, and managed a variety of field work activities for Phase II Environmental Site Assessments for evaluating known or potential sources of contamination on commercial, industrial, residential, and school properties throughout

Southern California. Phase II projects have included sampling and evaluation of results for soil, soil vapor, indoor air, and groundwater impacts. Chemicals of concern encountered on sites include, but are not limited to, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), polyaromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), metals, and pesticides. During each sampling activity, Ms. Fields was responsible for ensuring proper collection, preservation, and handling of samples; classification and logging of soil; and making decisions for additional sampling at each field location. Additionally, Ms. Fields was responsible for assuring proper utility clearance was conducted prior to all subsurface investigations and for monitoring the health and safety for herself and subcontractors during all sampling events.

- Ms. Fields has performed oversight activities in association with groundwater sampling and groundwater remediation for both discrete and quarterly/semi-annual groundwater monitoring events. Ms. Fields has supervised single and multi-nested groundwater well installation and well development activities, directed the collection of grab groundwater samples using Hydropunch samplers, and overseen and collected groundwater samples from wells using both standard and low-flow purging techniques. Ms. Fields has been involved with groundwater remediation strategies, including operation of ozone injection, pump and treat, air sparge, and dual phase extraction remediation systems. Groundwater remediation O&M responsibilities overseen by Ms. Fields include collection of samples, measurement of groundwater conditions, performance of system maintenance, and collaboration with subcontractors to optimize the remediation system performance.
- Ms. Fields has successfully exhibited the ability to supervise multiple subcontractors and project team members, uphold a good rapport with tenants and the local community, and confidently interact with lead agencies while performing project tasks to completion in a timely manner. Her professional relationship and open line of communication with facility owners and operators has helped increase and maintain the trust and confidence of clients.

Vapor Intrusion Evaluation

- Ms. Fields has extensive experience in performing soil vapor surveys in accordance with the DTSC/LARWQCB *Advisory for Active Soil Gas Investigations* (July 2015) for soil vapor well installation and sampling. She has completed numerous soil vapor surveys under these guidelines for both VOCs and methane, and is experienced in the evaluation of soil vapor data relative to various regulatory screening levels and attenuation factors.
- Ms. Fields is well versed in performing indoor air sampling in accordance with the DTSC *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance)* (October 2011), as well as the *Final Draft Supplemental Guidance: Screening and Evaluating Vapor Intrusion* published by DTSC/RWQCB in February 2023. She has conducted numerous indoor air sampling events and building surveys under these guidelines both for due diligence and under the oversight of local agencies. Ms. Fields has assisted clients in identifying the source for chemicals identified in indoor air as well as evaluate and implement options for mitigation.

- Ms. Fields aided in the identification of the source of vapor intrusion concerns in an office building resulting from groundwater treatment activities at an offsite property which resulted in a preferential pathway allowing vapors with elevated BTEX compounds to affect indoor air almost 200 feet away from the treatment area. Ms. Fields worked with the offsite property's consultant to stop the spread of vapors onto the Subject Property and to determine an approach to resuming their remediation efforts with no effects on offsite properties.

Remediation Projects

- Ms. Fields has prepared removal action workplans, long term budgets for implementation of remediation activities, and removal action completion reports for remedial soil excavations and *in-situ* soil vapor and groundwater remediation sites. These workplans have been designed and conducted under agency oversight to remediate concentrations in soil, soil vapor, and groundwater to either background concentrations or concentrations that are protective of human health.
- Ms. Fields has managed and performed sampling for both small and large scale soil remediation projects for refineries, oilfields, and industrial properties. Remedial activities managed by Ms. Fields have included the oversight of multiple crews conducting excavation using backhoes, excavators, scrapers, large-diameter auger equipment, shoring, and daily slurry backfilling. Ms. Fields has directed excavation crews to separate and stockpile materials based on hazardous characteristics, collected confirmation samples, overseen the placement and compaction of backfill material, maintained a daily photo log and sketches of continually changing site conditions, and maintained open channels of communication with clients, subcontractors, laboratory personnel, and oversight agencies. Throughout each project, she maintained updated data tables of all analytical results, as well as documentation of soil quantities being disposed of and transported into the site. Ms. Fields has additionally overseen large scale soil grading projects for the purpose of identifying and remediating environmental concerns that were previously unidentified and addressing them under a Soils Management Plan.
- Ms. Fields has been directly involved with air monitoring of VOCs under the Air Quality Management District (AQMD) Rule 1166 at multiple excavation sites in Southern California. By keeping organized and detailed notes, she has been prepared to present all necessary field documentation to agency representatives that visit the field site. She has written and submitted status reports and the necessary permit amendments as project situations change. Ms. Fields has also trained onsite subcontractors to thoroughly and accurately conduct air monitoring under their own Rule 1166 permits.
- Ms. Fields has been involved with the design and installation of both pilot test and full-scale *in-situ* remediation systems, including soil vapor extraction (SVE), air sparging, and pump and treat systems to address properties with vapor intrusion and impacted groundwater concerns. Ms. Fields has conducted and managed routine operation and maintenance (O&M), data management and evaluation, progress reports, and agency communications regarding remediation extraction systems.

- Ms. Fields has prepared comprehensive Soils Management Plans (SMP) for multiple sites, both independently and under agency oversight. Tasks associated with implementation of SMPs has included conducting training with onsite personnel, remote evaluation of features identified during grading activities, site visits to evaluate potential areas of concern and collect samples, implementation of construction response activities and waste disposal, and preparation of construction response reports.
- Ms. Fields oversaw and directed the sampling and remediation at two former oilfield properties in Placentia, California with historic oil wells, truck loading areas, and tank farms. Approximately 800 tons from one site and approximately 1,100 tons from the second site of TPH-impacted soil was transported offsite for disposal. Confirmation sampling and soil vapor sampling was performed under the oversight of Orange County Health Care Agency. The first property received a No Further Action Certification and was redeveloped with residential housing. Due to access constraints from existing utilities, a small area of impacted soil was left in place to be addressed at a later date at the second property; however, conditional closure was obtained to allow for redevelopment of the site for residential use.

Industrial Compliance

- Ms. Fields was in charge of conducting extensive characterization sampling and evaluation of PCBs present within the concrete walls and floor of an active steel manufacturing facility. Working closely with the EPA and the client, Ms. Fields helped facilitate a risk-based TSCA approval in accordance with Title 40 of the Code of Federal Regulations (40 CFR) Section 761.61(c) for encapsulation of affected building materials which allowed the facility to continue manufacturing processes without endangering worker safety. Ms. Fields designed and coordinated sampling strategies which are conducted as part of an annual monitoring program under EPA oversight to ensure the continued effectiveness of the remediation strategy.

Litigation Support

- Ms. Fields has worked on multiple expert witness testimony presentations for litigation cases nationwide. She has been responsible for preparation of exhibits for trial and expert reports, database management and analysis, document management and review, cost allocation strategies, expert report preparation, and the production of presentation materials for expert witness testimony. Ms. Fields has been involved in the implementation of innovative modeling techniques used for determining cost allocation over time for historic releases to be used in assessing future site remediation efforts by different historical contributors and during varying insurance policy periods. She has been involved in litigation projects based in California and Federal courts for properties including oil refineries, nuclear facilities, and large parcels slated for development.
- Ms. Fields has developed innovative allocation costing approaches for proposing settlement costs for multiple litigation projects. The allocation cost spreadsheets were designed to be adjusted in real time for mediation and settlement discussions to provide maximum flexibility for legal counsel and judges to address cost allocation options.

- For an industrial property in Whittier, California, Ms. Fields conducted extensive historical research and sample collection to establish multiple definitive lines of evidence to support the argument that the concentrations of PCE identified in soil vapor on a client's property was the result of solvent releases and vapor encroachment from a rug cleaning business on the adjacent parcel.