

JAMES TWIFORD, P.E.

Education and Professional Development

- B.S., Chemical Engineering, University of California, Berkeley
- Professional seminars and company classes, including project cost estimating, hazard communication, process plant safety, wastewater treatment, Proposition 65 compliance, hazop analysis, soil and ground water remediation, and plant environmental compliance
- Occupational Safety and Health Administration 40-Hour Hazardous Waste Operations and Emergency Response Training
- Grade I Water Treatment Operator's Certificate
- Bay Area Training Corporation Safety Program for Refineries



Registrations and Professional Affiliations

- California Professional Chemical Engineer #CH5946
- American Institute of Chemical Engineers

Summary of Professional Experience

Mr. Twiford is a California Registered Professional Chemical Engineer with 29 years of chemical industry and environmental consulting experience including process and project engineering, environmental compliance oversight, and remediation project management. His areas of expertise include:

- Remediation and risk assessment for regulatory closure of petroleum and chemical release sites
- Design, construction, and operation of soil and ground water remediation systems
- Process improvements and cost control in chemical manufacturing, waste treatment, and environmental compliance operations
- Chemical plant and Resource Conservation and Recovery Act (RCRA) facility environmental compliance, safety audits, and hazard training.

Representative Experience

Remediation and Risk Assessment for Closure of Petroleum and Chemical Release Sites

- Mr. Twiford served as Project Manager for a former petroleum distribution terminal site where risk assessment obtained regulatory closure despite remaining hydrocarbon concentrations in ground water.
- Mr. Twiford served as Project Manager for a former airport shuttle service site where risk assessment was performed to recommend regulatory closure despite remaining hydrocarbon concentrations in ground water. The regulatory agency is currently reviewing the closure request.
- Mr. Twiford served as Project Manager for a refinery site where risk assessment was performed to convince the regulatory agency that further remedial action was not required at a specific operating area.
- Mr. Twiford served as Project Manager for a former medical device manufacturing site where regulatory closure was obtained by fate and transport modeling to convince the regulatory agency that perchloroethylene detected in ground water samples poses limited risk.
- Mr. Twiford served as Project Manager for seven locations of a wood products client where diesel underground storage tanks were removed followed by remedial excavations, onsite soil remediation, and follow-up drilling and sampling as required by regulatory agencies to achieve closure at each site.

Design, Construction, and Operation of Soil and Ground Water Remediation Systems

- Mr. Twiford performed all in-house environmental engineering as Supervisor of Technical Services for a chemical manufacturing company. Projects included ground water characterization, feasibility studies, a Remedial Action Plan, and the design, construction, and operation of ground water remediation and process wastewater treatment systems. Chemicals of concern included solvents (dense nonaqueous phase liquid [DNAPL] suspected), wood preservatives, dioxin, metals, and gasoline.
- Mr. Twiford served as Project Manager for design, construction, and operation of one soil and three ground water remediation systems at a refinery site. Work included pilot testing and development of a Remedial Action Plan.
- Mr. Twiford served as Project Manager for design, construction, and operation of 400 and 600 gallon per minute air strippers for treatment of irrigation water from agricultural wells containing solvents.
- Mr. Twiford served as Project Manager for design, construction, and operation of a ground water remediation system at a trichloroethylene release site with suspected DNAPL. Work included pilot testing.

- Mr. Twiford served as Project Manager for design, construction, and operation of a ground water remediation system at a perchloroethylene release site. Work included pilot testing and development of a Remedial Action Plan.
- Mr. Twiford served as Project Manager for design, construction, and operation of a vapor extraction system remediating aviation gasoline releases at an airport site. Work included pilot testing.
- Mr. Twiford served as Project Manager for design, construction, and operation of a vapor extraction system remediating gasoline and diesel releases at a fruit cannery site. Work included pilot testing and development of a Remedial Action Plan.
- Mr. Twiford served as Project Manager for design, construction, and operation of an air sparging system at an operating petroleum distribution terminal site.
- Mr. Twiford served as Project Manager for design, construction, and operation of remediation systems at numerous petroleum retail service station sites, with systems including ground water extraction, soil vapor extraction, and air sparging. Work included pilot testing and development of Remedial Action Plans.

Process Improvements and Cost Control

- As Plant Manager at a continuous operations chemical plant, Mr. Twiford increased production volume by more than 20 percent and decreased unit product cost by more than 15 percent through a series of process improvements and de-bottlenecking projects over a period of three years.
- As manager of operations at a newly-constructed RCRA wastewater treatment facility, Mr. Twiford decreased operating costs more than 20 percent in 1 year through process modifications and operating improvements.

Environmental Compliance of Operations

- Mr. Twiford served as Manager of Operations for three RCRA wastewater treatment facilities at a major aerospace company with no environmental violations. In addition to RCRA regulation, compliance included discharge permits to air, sanitary sewer, and surface water (National Pollutant Discharge Elimination System [NPDES]). Regulatory oversight included annual audits by the California Environmental Protection Agency.
- Mr. Twiford managed environmental compliance at two chemical manufacturing plants in California for different companies. Issues included air discharge permits, NPDES surface water discharges, sanitary sewer discharges, and stormwater management plans. At one of the companies, Mr. Twiford also updated the stormwater management plan for a plant in Ohio.
- Mr. Twiford served as Project Manager for development of Stormwater Pollution Prevention Plans at an ordnance manufacturing facility and an aircraft controls manufacturing facility.

- Mr. Twiford developed RCRA ground water monitoring plans for two client-operated RCRA units.
- Mr. Twiford served as Project Manager for implementation of a ground water Containment Zone Management Plan at a former heavy truck manufacturing facility adjacent to San Francisco Bay.

Process Safety

- Mr. Twiford served as Project Manager for installation and maintenance of carbon adsorption treatment units at 12 residential water systems served by domestic wells containing solvents.
- Mr. Twiford served as Project Engineer for a nationwide program of safety improvements for oxygen pipelines at an industrial gasses company.
- Mr. Twiford conducted hazard communication training at chemical plants in Alabama, California, Georgia, and South Carolina, including Proposition 65 training in California.
- Mr. Twiford developed and/or revised Hazardous Materials Management Plans at three California chemical plants for different companies. Also, Mr. Twiford served as Project Manager for development of a Hazardous Materials Management Plan at an aircraft controls manufacturing facility.