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35 years of experience · Walnut Creek, California

Amy currently manages Stantec's remediation practice in Northern California, with approximately 95 staff located in seven offices. She brings 35 years of experience in numerous large- and small-scale projects for industrial, government, and municipal clients.

Her expertise encompasses overseeing projects conducted at a California refinery by the historical environmental liability work group, including current and past refinery owners. Her work has included investigations, designs and/or closure of 12 historical waste sites under Title 27 regulations. She has designed landfills closure covers including closure and post-closure maintenance plans, detailed closure drawings and specifications, observed closure construction activities for compliance with plans and specifications, prepared post-closure monitoring plans and overseen post-closure operations and maintenance. Her knowledge also includes remedial investigation/feasibility studies (RI/FSs), remedial design, construction, and due diligence support during property acquisition and divestitures, including supporting PBF during acquisition of the MRC Refinery in Martinez.

She has extensive remediation, project management, construction management, client management and business management experience.

EDUCATION

MS/MSc, Civil and Geotechnical Engineering, University of California, Berkeley, California, 1993

BS/BSc, Civil Engineering, University of California, Irvine, California, 1990

REGISTRATIONS

State of California

Professional Engineer #C54377

MEMBERSHIPS

Member, Society of Women Engineers

Member, Association of Women in Water, Energy & Environment

Board Member, Industrial Association of Contra Costa County, 2017-Present

Alternate Seat, Contra Costa County Hazardous Materials Commission

PROJECT EXPERIENCE

Environmental Liability Support

Environmental Liabilities Assessment, PBF Martinez Refinery | California | Principal Engineer

The project included acquisition support for a Refinery in California, including review of publicly-available records, regulatory files, and file room documents. We compiled detailed summaries of about 60 liability site histories, evaluated compliance with federal and state regulatory orders and identified data gaps. We developed an understanding of environmental impacts and prepared estimable and probable environmental liability estimates. We supported the client during pre-acquisition and continued to support through establishment of opening balance for environmental reserves.

Assessment of Environmental, Regulatory and Financial Liabilities for Southern California Refinery and Logistical Assets | Carson, California | Principal Engineer

The assessment program involved detailed evaluations of existing and potential environmental conditions at a large number of facilities that store and distribute crude oil, refined products, and other chemicals. Properties included a refinery, 9 terminals, and hundreds of miles of pipelines. Assessment of state and federal regulations addressing the mitigation and restoration of identified environmental conditions were conducted so that regulatory and financial impacts on facility operations for corrective actions and post-closure work could be accurately estimated. The project included a summary report documenting environmental findings and estimating costs for remediation, system upgrades, and operations and maintenance, and summarizing findings.

Assessment of Environmental, Regulatory and Financial Liabilities for Southern California Refinery and Logistical Assets | Principal Engineer

The program involved detailed evaluations of existing and potential environmental conditions at a California Refinery. Work included evaluating Refinery tank and pipeline assets prior to dropping-down the assets from the Refining branch to Logistics branch. Stantec summarized environmental findings and estimated costs for potential liabilities, including system upgrades, and O&M. Presentation slides summarized findings.

Waste Management Units and Impoundments

Active Class II Surface Impoundment Evaluation | Marathon | Martinez California | Project Manager/Lead Engineer

The evaluation included a detailed site investigation to characterize two ponds for compliance with California Code of Regulations (CCR) Title 27 construction standards. The ponds cover a cumulative 128 acres of land with a holding capacity of approximately 220 MG of wastewater. The site investigations included installation of soil borings within the pond bottoms and berms and installation of perimeter groundwater wells. The Evaluation Report included geologic and hydrogeologic conditions of the impoundments and geotechnical calculations which were used to evaluate the compliance of the impoundments with regulations.

Stockpile Closures | Exxon | Benicia, California | Design Engineer

Ms. McTigue was the design engineer for two waste site closure at the Exxon Refinery in Benicia, California. She designed and wrote specifications for soil covers, drainage channels, erosion control blankets, and revegetation. Remedial action at one site included grading to reduce the potential for erosion and installing a topsoil cover; the other site was graded to reduce erosion, and a compacted clay layer and topsoil layer was installed. Site drainage was controlled through terraces, cap channels, perimeter channels, erosion control blankets, and revegetation. Ms. McTigue performed construction observation with periodic site visits to document that closure activities were conducted in accordance with project plans and specifications, and the City of Benicia Grading Permit requirements. Following construction activities, she prepared a closure documentation report, including as-built drawings.

Fort Irwin Landfill Closure and Post-Closure Maintenance Plans | U.S. Army Corps of Engineers | Fort Irwin, California | Design Engineer

Ms. McTigue was the design engineer for the CERCLA closure of two abandoned landfills (FTIR-02 and FTIR-04) at Fort Irwin, California. The selected remedial action for the landfill sites included the installation of a 2-foot native soil cover. CAD tools were used to generate the grading maps for the landfills and to optimize the cut and fill operations in order to reduce cost. She performed watershed modeling and designed perimeter drainage channels to control surface water run-on and run-off. She prepared the Closure and Post Closure Maintenance Plan, including detailed design drawings and specifications.

Environmental Site Remediation

Marathon Projects | Marathon | Martinez, California | 2007-Ongoing | Program Manager

Amy oversees work performed at the Marathon Martinez Facility, including LNAPL management and reporting, groundwater compliance monitoring and evaluation, Waste Management Unit (WMU) characterization, closure design and construction, and operations and maintenance (O&M) of closed WMUs. She reviews work and reports conducted by other consultant teams and provides guidance for projects that could potentially impact Facility operations.

Amy provides support for liability estimates for historical liability projects. She reviews quarterly consultant estimates and prepares quarterly adjusted updates to the

liability estimates and reserves, supporting budget planning activities

River/Napa Creek Flood Protection Project | U.S. Army Corps of Engineers | Napa, California | Project Manager/Design Engineer

The U.S. Army Corps of Engineers (USACE) and the Napa County Flood Control and Water Conservation District (NCFWCWD) implemented flood management features along a 7-mile stretch of the Napa River through and south of the City of Napa as part of the Napa River/ Napa Creek Flood Protection Project (Project). About a half mile stretch of the project included nine properties in the area of current and former bulk fuel facilities. Because these sites were in the area requiring soil excavation to construct flood and marsh plain terraces the flood protection improvement and soil remediation efforts were conducted simultaneously with regulatory oversight from USEPA Region 9.

Consolidated Remedial Action Plan | NCFCD | 2000-1
Stantec proposed and negotiated the contaminant clean-up levels for the project with the USEPA. NCFWCWD prepared a Consolidated Remedial Action Plan (RAP) with support from Stantec. The RAP described the conceptual remedial action approach, as part of the Flood Project terracing. The work included a Pre-Construction Site Investigation field program, preparation of volumes estimates, cost estimates, and a 3-year project schedule. We presented to the public, regulatory agencies and property owners, which was essential to negotiations during land acquisition for the project.

George Air Force Base Multiple Projects | Air Force Center for Environmental Excellence | Victorville, California | 1993-1998 | Project Engr/Design Engr

Ms. McTigue was the design engineer for CERCLA closure of five landfills at George Air Force Base (GAFB), California. Design objectives included minimization of impact to surrounding vegetation and habitat, and utilization of oversized drainage channels to provide soil for the landfill covers. Ms. McTigue also prepared the Long-Term Monitoring and Maintenance Plan for the landfill in accordance with Title 27 regulations.

Ms. McTigue conducted the pre-design for the expansion of the Operable Unit (OU) 1 groundwater extraction, treatment and disposal system. She analyzed groundwater modeling results for 15 extraction, treatment, and disposal scenarios and presented the results to the client and the regulatory agencies. The modeling scenarios were optimized to maximize TCE mass removal and to contain the contaminant plume. She was involved in the design of pipelines, pumps, and a percolation pond to discharge treated effluent.

She was the primary author of the GAFB OU 3 RI containing 60 discrete sites, including landfills, disposal sites, waste pits, spill sites, fire training areas, and other disturbed areas.

Presidio of San Francisco Building 637 Corrective Action Plan | U.S. Army Corps of Engineers | San Francisco, California | Project Engineer

Ms. McTigue prepared a corrective action plan (CAP) for a former gasoline station site. The CAP utilized local regulatory guidance that has not been applied at many military installations in the San Francisco Bay Area. The guidance recommended the implementation of a "low-risk" approach for evaluating fuel-contaminated groundwater at the site. This approach resulted in the recommendation of a groundwater monitoring program to protect receptors in a nearby wetlands. Ms. McTigue also evaluated various treatment alternatives for the fuel-contaminated soil remaining at the site.

**San Fernando Valley RI/FS | City of Los Angeles
Department of Water and Power | Glendale, California |
1991-1992 | Engineer**

Ms. McTigue was a project engineer for the preparation of RI/FSs for the Los Angeles Department of Water and Power. She was involved in the preparation of one RI and two FSs for two VOC-contaminated groundwater sites located in Southern California. The FSs evaluated groundwater extraction, treatment, and disposal options for remediating VOC-contaminated groundwater. Ms. McTigue was involved in the human health risk assessments and the cost analyses for the various remedial options. She also addressed regulatory and client comments on the documents.

George Air Force Base Landfill Closure and Post-Closure Maintenance Plans | Air Force Center for Environmental Excellence | Victorville, California | 1995-1996 | Design Engineer

Ms. McTigue was the design engineer for CERCLA closure of five landfills at George Air Force Base (AFB), California. The selected remedial action for two of the landfill sites included the installation of a 2-foot native soil cover. The selected remedial action for the other three sites was the rehabilitation of the existing soil covers to provide at least a 12-inch soil cover. In order to reduce infiltration into the landfills, the soil covers were designed to promote surface water run-off by maintaining at least a 3 percent slope, and perimeter drainage controls were designed to divert surface water run-on around the landfill boundaries. Design objectives included minimization of impact to surrounding vegetation and habitat, and utilization of oversized drainage channels to provide soil for the landfill covers. CAD tools were used to generate the grading maps for the landfills and to optimize the cut and fill operations in order to reduce cost.

George Air Force Base Operable Unit 3 Feasibility Study | Air Force Center for Environmental Excellence | Victorville, California | 1996-1997 | Design Engineer

Ms. McTigue was involved in the conceptual design of two bioventing systems and one soil vapor extraction system at George AFB. The bioventing systems were designed to remove hydrocarbons and BTEX constituents from vadose zone soils. The SVE system was designed to remove hydrocarbons, BTEX constituents, and TCE from vadose zone soils. She also prepared the work plans for the construction and closure of the treatment systems. The work plans included a remediation and management, site preparation, spill and discharge control, emission control, excavation, transportation, and demobilization and closure plans.

Removal Action at Installation Restoration Program Sites 1, 4 and 11 | Department of the Navy, Navy Facilities Engineering Command | Point Mugu, California | 1996-1997 | Engineer

Ms. McTigue was the project engineer for closure of two sites at NAWS Point Mugu, California. The sites included a landfill (Site 1) and a maintenance/storage yard (Site 4). The selected removal action for the landfill was construction of a riprap wall to protect further erosion of the shoreline and contamination of the lagoon with landfill materials. Additionally, a new storage yard was constructed on the landfill. The selected removal action for the maintenance/storage yard was excavation of the metals- and PCB-contaminated soil. Upon completion of the removal action, the maintenance/storage yard was demolished, and a mud flat, sand island, marsh and tidal creek was constructed at the site to provide wetlands habitat for endangered bird species. Ms. McTigue prepared the Site 1 removal action plan and designed the riprap wall and storage yard. She also prepared the limits of excavation and sampling drawings for Site 4 and participated in the design of the wetlands habitat.

Presidio of San Francisco, Landfill Design Summary Report | U.S. Army Corps of Engineers | San Francisco, California | Project Engineer

Amy served as project engineer to develop the Presidio of San Francisco Landfill Design Summary Report. She researched historical documents and records to determine site history and usage. Historical topographical maps were used to estimate landfill boundaries and volumes of waste in Microstation.

George Air Force Base Landfill Post-Closure Maintenance Plans, USAF PA/RD DO50 | Air Force Center for Environmental Excellence | Victorville, California | 1998 | Design Engineer

Ms. McTigue prepared the Long-Term Monitoring and Maintenance Plan for the landfill in accordance with Title 27 regulations. The plan included requirements for monitoring and maintenance of the landfill cover-integrity, and for groundwater monitoring. The cover-integrity requirements included descriptions of the landfill site inspections, maintenance and repairs, reporting requirements, and five-yearly iso-settlement maps.

George Air Force Base Operable Unit 3 Remedial Investigation | Air Force Center for Environmental Excellence | Victorville, California | 1993-1996 | Engineer

Ms. McTigue was the primary author of the George AFB Operable Unit (OU) 3 RI that consists of approximately 60 discrete sites. These sites include landfills, disposal sites, waste pits, spill sites, fire training areas, and other disturbed areas. She prepared site histories, discussions and results of field investigations, and contamination assessments. She was also involved in the vadose zone contaminant transport modeling and the site-specific and basewide human health risk assessments.

Culvert Assessment and Improvements | Tosco Refining Company | Port Costa, California | 1996-1997 | Design Engineer

Ms. McTigue performed a surface water hydrology assessment to evaluate the hydraulic capacity of an existing 36-inch diameter culvert section that extends under a railway line. She evaluated various options for repairing or replacing the culvert section so that hydrocarbon product that was entering the stormwater system from between the joints in the existing culvert would be sealed outside of the culvert. A cured-in-place pipe (CIPP) was selected as the preferred alternative for repairing the culvert.

Vapor-Enhanced Extraction System Optimization | Viavi (formerly Optical Coating Laboratory and JDS Uniphase) | Santa Rosa, California | 2002-2004 | Project Manager

Groundwater and vapor sampling was performed for the Vacuum-Enhanced Extraction (VEE) System periodically from 2000 to 2004. All available system operation and maintenance (O&M) and sampling data was summarized in the VEE System Performance report (2003), and recommendations to enhance system operation were presented. VEE system performance data is summarized annually, and system operation optimization recommendations are made annually.

Data Gaps Assessment and Investigations | Southern California | 2003-2005 | Project Manager

Ms. McTigue oversaw compilation of site history and environmental data for sites at a historical testing facility. The existing site data and available facility records were assessed to determine if nature and extent of potential or known chemical impacts could be assessed adequately in the RFI reports for the sites in the various reports. Data gaps were identified and presented and summarized for the client and other responsible parties. Field investigations were scoped and detailed proposals were developed for the data gaps investigations. Ms. McTigue managed the field investigation team and data management teams during the investigations and through completion and upload to the client data management system.

Remedial Investigation Report | Southern California | 2003-2005 | Project Manager

Ms. McTigue managed the RFI report for a group of three sites at a testing facility in Southern California. The report documented chemical use at each of the sites and summarized available chemical data for each of the chemical use areas. Historical data and historical site use were evaluated and data gaps were identified. Work plans were prepared to prepared and investigations were conducted to close the identified data gaps. Historical investigation results were summarized and evaluated along with the data gaps investigation. Risk assessments were performed for each of the sites. The report recommended chemical use areas for consideration in the Corrective Measures Studies (CMS) report.

Confidential Project in Response to California Water Code Section 13267 Order | Confidential Client | Bakersfield, CA | Project Director

Amy managed Stantec's support for a confidential client response to a California Water Code Section 13267 Order that required information about injection wells, fluids injected into the aquifer, quality of groundwater in the aquifers, lateral and vertical extent of groundwater impacts from injected fluids, and water supply wells completed in the aquifers. Stantec worked with the client to prepare a work plan outlining the proposed tasks and schedule to comply with the Order requirements. Stantec reviewed and compiled into a technical report submitted to the RWQCB, the required historical data and new data required by the Order. The technical report included a list of active, inactive and abandoned injection wells completed in the named formation along with construction information, logs and analytical data, historical and current injection fluid analytical data, formation pressure data from injection zone(s), water supply well construction information and analytical data within 3 miles of injection wells. Stantec also reviewed and compiled mechanical integrity tests and other required compliance data. Amy relied on technical subject matter experts (SMEs) including geologists, hydrogeologists, groundwater modelers, geochemists, chemists, GIS and database managers to prepare a conceptual site model for two oil fields, which included groundwater quality evaluation, water budget analysis, and lateral and vertical extent of impacts.