Patrick C. Korths
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EMPLOYMENT

2010 – Present CarriageHouse Consulting, Inc., Natick, MA.
Senior Project Manager

2009 H&S Environmental, Westborough, MA
Project Manager

2004-2008 CAMP DRESSER & MCKEE, Cambridge, MA
Geologist & Project Manager

1998-2004 S E A CONSULTANTS, Cambridge, MA
Senior Project Scientist

1993-1998 HANDEX ENVIRONMENTAL, Marlborough, MA
Hydrogeologist

EDUCATION

M.S., Geology, SYRACUSE UNIVERSITY, Syracuse, NY 2006
Emphasis in Hydrogeology and Environmental Engineering

B.A., Geology, UNIVERSITY OF ROCHESTER, Rochester, NY 1989
Minor in Political Science

Hydrogeology Field Camp, MONTANA TECH OF THE UNIVERSITY OF MONTANA, Butte, MT 1990
Five week course focused on aquifer test analysis at a Superfund mine tailings site

RECENT CONTINUING EDUCATION COURSES

- LSPA one day courses: Wetlands, Wetland Regulations and the MCP (2009); LNAPL Mobility and Recoverability (2008); Slug Test Field Course (2008); Aquifer Test Analysis in Fractured Rock (2007); Hydrogeology of Massachusetts (2003); Surficial Geology of New England (2003)
- Hydrogeology of Fractured Bedrock, Fractured Rock Educational Services, four day course 2005
- Program for Emerging Leaders, American Council of Engineering Companies (ACEC) of Massachusetts 2004

CERTIFICATIONS & MEMBERSHIPS

- Certified Geologist, State of Maine, 2009 Certification requirements included passing of the National Association for State Boards of Geology (ASBOG) Practice and Fundamentals Examinations, and Northern New England Geology Examination (state specific).
- Licensed Professional Geologist, State of New Hampshire 2002-Present
- Certified Hazardous Materials Manager 2007-Present
- Massachusetts Department of Fire Services Approved Third Party Inspector of USTs (2009)
- OSHA Certifications: 8-hour Refresher (2009); 10-hour Construction Safety and Health (2008); 8-hour

- Supervisor (2002); and 40-hour HAZWOPER (2003)
- ExxonMobil Loss Prevention System 8-hour Safety Certification (2004)

PROFESSIONAL AFFILIATIONS

- American Institute of Professional Geologists (AIPG)
- Geological Society of America (GSA)
- Geological Societies of Maine (GSM) and New Hampshire (GSNH)
- Massachusetts License Site Professional Association (LSPA)
- National Ground Water Association (NGWA)
- New England Academy of Certified Hazardous Materials Managers (NEACHMM)
- New York State Council of Professional Geologists (NYSCPG)

EXAMPLES OF RELEVANT EXPERIENCE

Project Manager/Geologist, Assessment and Cleanup of Retail Gasoline Stations throughout New England. Mr. Korths managed regulatory compliance of petroleum releases (gasoline, diesel, heating oil, and used oil) at over 75 retail gasoline stations located in Massachusetts, New Hampshire and Rhode Island for ExxonMobil, Shell, Sunoco, Gulf/CFI, and Mutual Oil. Supervised installation of over 250 monitoring wells; coordinated quarterly and semi-annual groundwater monitoring events to evaluate contaminant plumes in overburden and fractured bedrock flow regimes; conducted over 20 comprehensive site assessments, oversaw over 50 UST closures, and performed remedial design, implementation and O&M management of SVE/AS and P&T systems. Achieved expedited site closures reducing operating costs by >$2M.

Senior Project Scientist, UST Removals, Public Works Facility Expansion Construction and Incinerator Demolition, Watertown, MA. Mr. Korths managed the closure of five underground storage tanks (USTs) related to the expansion of a public works facility and the demolition of the town incinerator. Four of the USTs were not documented in town records or identified during pre-construction activities, and were discovered during construction activities. The UST removal work included management of field personnel, collection of post-excavation samples, management of impacted soil and groundwater, and preparation of UST closure reports and IRA reports. Mr. Korths' management of removal activities minimized potential impacts to construction schedules while meeting MCP and MA UST closure requirements.

Project Scientist, Source Removal and Oxygen Additive Program, Release Abatement Measure (RAM), Burlington, MA. Under a RAM Plan, Mr. Korths supervised a remediation project at a DPW facility that involved the excavation of petroleum-impacted soils and use of oxygen release compounds (ORCs). A substantial area of soil and groundwater was impacted by a historical UST release. The objectives of the RAM were to remove the contaminant source and to remediate the residual contamination that remained along a DPW facilities building foundation. After the excavation of approximately 300 tons of impacted soils, ORCs were added to the open excavation to enhance the growth and activity of the existing microbial population. This cleanup work occurred adjacent to wetlands and required obtaining permits with the Burlington Conservation Commission and the MassDEP Wetlands Department. Post excavation and groundwater sampling results supported a Class C RAO for long-term groundwater monitoring.

Project Geologist, Sewer Separation, Utility-Related Abatement Measure (URAM), Alewife Parkway/Route 2, Cambridge, MA. Mr. Korths oversaw the sewer separation construction work by documenting field activities, monitoring soil and groundwater conditions, and ensuring proper management of impacted soils and groundwater. Mr. Korths was responsible for managing six Release Tracking Numbers (RTNs)/URAMs and the environmental project budget (>$230,000). Mr. Korths worked directly with the contractor and subcontractors to ensure proper soil and groundwater management. Mr. Korths reviewed

contractor requests for payment items related to soil handling and off-site disposal. Mr. Korths designed field procedures to monitor and control contaminant migration. He also prepared URAM Plans, Status and Completion Reports; and USEPA NPDES discharge monitoring reports.

Project Geologist, URAM for Pump Station Construction, Burlington, MA. Mr. Korths completed field activities including the installation of a sewer pump station and associated piping on a public right-of-way adjacent to two MassDEP listed sites. Based on the required depth of the excavation, it was necessary to develop and enforce specifications to minimize the discharge of groundwater. Mr. Korths performed the following tasks: pre-characterization of soil and groundwater prior to construction, defining performance requirements of the groundwater treatment system, monitoring system operation, compliance sampling of the system, coordination of quick turn-around sample analysis to adjust pumping rates to minimize movement of contaminants in groundwater and construction schedules. Mr. Korths prepared a URAM Completion Report which included a Release Notification Retraction. He also prepared USEPA NPDES discharge-monitoring reports.

Senior Project Scientist, In Situ Bioremediation Program at Public Transit Bus Maintenance Depot, Worcester, MA. Mr. Korths designed and implemented a large-scale bioremediation program under MCP Phase III and IV requirements at a public transit bus maintenance depot to remediate a 200' x 75' free-phase plume of No. 6 fuel oil, No. 2 fuel oil, and motor oil. The design involved a grid system of 4-inch diameter access ports placed at approximately 10-foot spacings. The access ports were periodically inoculated with microbes and nutrients. This bioremediation program proved very effective in reducing hydrocarbons to concentrations below applicable cleanup standards, and had minimal interruption to a facility that operates 24 hours a day, 365 days a year. A conventional approach of mass soil excavation and transport to an off-site facility for asphalt batch recycling would have been a costly alternative. In this case, mass soil excavation would have been impeded by permanent structures, and complicated by high water-table conditions (i.e., dewatering and treatment of grossly impacted groundwater). The implemented in situ bioremediation program saved the client approximately $0.5M. Mr. Korths worked closely with the client and the MassDEP to meet all Interim Deadlines associated with several submittals including Phase III, Phase IV and Phase V reports. In October 2004, Mr. Korths presented a poster summarizing this successful bioremediation program at the 20th Annual Conference on Contaminated Soils, Sediments and Water at the University of Massachusetts in Amherst, Massachusetts.

Hydrogeologist, CSA and Remediation, CITGO Bulk Petroleum Storage Terminal Facility, Braintree, MA. As part of CSA field activities, Mr. Korths supervised the installation of over 25 monitoring and recovery wells in unconsolidated and bedrock aquifers. He coordinated semi-anuual groundwater gauge and sample events for approximately 75 monitoring wells. Mr. Korths conducted and analyzed slug and pumping tests. He managed data collection and interpretation, and prepared Phase II CSA and Phase III Remedial Alternative Evaluation for MassDEP submittal. Mr. Korths also managed the terminal's overburden and bedrock NAPL/groundwater recovery system located at the terminal's loading rack. The remedial system included a 4,000-gallon bioreactor used for BTEX treatment. Hydraulic control was maintained using pneumatic pumps and electric submersible pumps. Mr. Korths prepared monthly NPDES discharge monitoring reports and quarterly remedial system monitoring reports for submittal to MassDEP.

Hydrogeologist, Water Supply Redevelopment, Town of Rockport, Rockport, MA. Mr. Korths was the project field hydrogeologist for the redevelopment of a Town water supply comprised of twenty-six, 2-inch diameter wells set in a wetlands. This well field had become inoperable after over 15 years of inactivity. Mr. Korths oversaw all field activities related to this project including: the installation of eight monitoring wells; a geophysical survey to determine the depths of the water bearing overburden units and top of bedrock; pumping tests; and the installation of three 8-inch production wells.

Hydrogeologist, CSA, Champion Oil Corp., Bulk Petroleum Storage Terminals, CT. As part of comprehensive site assessments (CSAs) at Champion Oil Corp. petroleum bulk storage distribution terminals in Bridgeport, New London, New Milford and Stamford, CT. Mr. Korths supervised the installation of over 25 monitoring wells. He collected soil and groundwater samples, conducted hydraulic

conductivity testing, and prepared Phase II CSA Reports for submittal to CTDEP. These terminals were located adjacent to surface waters.

Project Manager, Groundwater Monitoring Program and System Installation, City of Keene PWD, Keene, MA. As required under a NHDES Groundwater Management Permit (GMP), Mr. Korths managed a semi-annual groundwater monitoring program for a former open pit dump/landfill owned by the City of Keene. The program required collection of groundwater samples from approximately ten monitoring wells and four surface water samples. Samples were field-preserved and/or field filtered and analyzed for VOCs, SVOCs including PAHs, metals and general chemistry. Mr. Korths prepared a Baseline Report and three Annual Reports summarizing sampling results during his management of the GMP. Installation of an oil recovery system was also required under the GMP. The system design included six recovery wells using electric scavenger pumps to recover oil and maintain hydraulic control. Mr. Korths managed the construction of system including reviews of shop drawings, project submittals and payment requests.

Hydrogeologist, Extraction Well Installation Oversight, National Grid/Former Niagara Mohawk MGP Site, Utica, NY. As part of remedial system implementation, Mr. Korths oversaw the installation of two, 12-inch diameter, 50-foot deep extraction wells. A cable tool drill rig was used to drill the extraction well boreholes. Mr. Korths was responsible for safety, construction oversight, interfacing with NYSDEC site inspectors, and site security for all activities related to drilling and well installation activities including well development. The extraction well installation activities were completed over three weeks during the winter season. The field project was completed under budget by approximately $10K and without a safety incident.

Project Manager, Construction Oversight and MCP Services, Town of Brookline, MA. Mr. Korths provided construction oversight and MCP services (URAM, RAM, LRA, Phase I and Tier IB Permit Application) during construction activities associated with storm water drainage, surface water improvements, and wetlands creation at a four-acre park with an on-site pond. MCP services included evaluation of contaminants in pond sediments with respect to reportable concentrations and the completion of Tier Numerical Ranking System scoresheet.