AIPG ABSTRACT FOR MEETING IN MILWUAKEE: GEOLOGIC FACTORS APPLIED TO THE SUCCESSFUL DESIGN OF IN-SITU ENVIRONMENTAL REMEDIATION USING JETTING TECHNOLOGY

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ABSTRACT

In-situ environmental remediation is optimized when geologic factors such as lithology, permeability, porosity, contaminant, soil and groundwater chemistry are fully evaluated and integrated into the design and implementation of a remediation program. The largest percentage of environmentally contaminated sites lie on shallow soil and uncompacted soil of alluvial and coastal plains where subsurface conditions consist of complex interstratified sediments. Therefore, a thorough understanding of geologic conditions is critical in designing in-situ remediation processes and in determining the preferred flow pathways and subsequent transportation of contaminants in the subsurface.

Jetting is a remediation delivery technology originally developed over fifty years ago as high-pressure tree-root feeder systems. Improvements and updates in the delivery equipment have allowed jetting to introduce liquids for a variety of chemical and biological processes to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or groundwater. The in-situ remediation is accomplished by adding liquids to oxidize, bioremediate, neutralize or precipitate contaminants in the subsurface without digging and handling of the soil or water.

Jetting is usually a more economical and less disruptive to site activities than the more conventional approaches. The main benefits of in-situ remediation systems over conventional methods are the lower final cost for remediation, minimum cost for operations and maintenance, no moving parts that could break and no discharge permits or waste disposal of liquids for in-situ groundwater treatment. The injection holes are then sealed with cement grout or bentonite, as needed. Jetting can be used for both in-situ, as well as ex-situ applications, such as a treating soil piles. Jetting is especially effective in treating localized areas of high contamination, often called “hot spots.” Case studies using the Remediation Injection Process (RIP®) will summarize the delivery capability in various soil conditions using oxidation and bioremediation technology. Case studies will feature a variety of contaminants, including gasoline, diesel, tetrachlorethylene (PCE), trichloroethylene (TCE), dichloroethylene (DCE), and toluene.

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