
INNOVATIVE REMEDIATION TECHNOLOGIES OF GROUNDWATER CONTAMINATED WITH CHLORINATED SOLVENTS

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Contamination of groundwater with chlorinated solvents such as tetrachloroethene (PCE), trichloroethene (TCE), dichloroethane (DCA) and others is a widespread problem in both developed and developing countries throughout the world. These chemicals are being extensively used in various industrial and manufacturing processes including production of other widely used chemicals such as vinyl chloride. PCE and TCE are also used by small business including dry cleaners and paint shops, and for general-purpose degreasing. Because of their chemical and physical characteristics, relatively small quantities of chlorinated solvents can contaminate large volumes of groundwater, which are then often difficult to remediate with classical technologies such as pump-and-treat.

One of the developing trends in the environmental industry is in-situ remediation of chlorinated solvents, in both free and dissolved phases, that significantly reduces typically high operations and maintenance cost of pump-and-treat systems, and at the same time destroys mass of contaminants in the subsurface. These innovative technologies include bioremediation (bioaugmentation/enhanced biodegradation), chemical oxidation, reactive barriers and monitored natural attenuation. This paper covers technical overview of the technologies and various case studies from the United States.