



Source identification and allocation of multiple chlorinated contaminants using the seasonal impacts of rainfall events in an industrial complex, Wonju, Korea

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Source identification and delineation of the multiple chlorinated contaminants in groundwater are the essential task to remediate the contaminated groundwater. The identification and allocation of the multiple chlorinated contaminant sources in subsurface were examined using the various hydrogeologic investigations and several rounds of groundwater sampling at an industrial complex, Wonju, Korea. In this study, an illustrative example was presented highlighting the potential impacts of rainfall events as key factors for discriminating the multiple chlorinated contaminant sources, even in the presence of the multiple chlorinated contaminants and relatively low concentrations of sources in the micrograms per liter range. Using the historical approach and chemical fingerprinting, apparent main source of the multiple chlorinated contaminants such as trichloroethene, carbon tetrachloride, and chloroform with high contaminant concentrations was identified at the uppermost area of study site while the other source locations of multiple chlorinated contaminants were identified using the seasonal impact of rainfall events. Based on the monitoring well locations, three source spots of multiple chlorinated contaminants by the contaminant plume distributions were delineated and five more source locations including the main source spot were identified. The seasonal impact analysis demonstrates its effectiveness on the source identification and allocation of multiple chlorinated contaminants.