[EE] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-GE Geological & Soil Environment

[A-GE30]Energy-Environment-Water Nexus and Sustainable Development

convener:Ming Zhang(Institute for Geo-Resources and Environment, Geological Survey of Japan, AIST), Ken Kawamoto(Graduate School of Science and Engineering, Saitama University), Xue Qiang(中国科学院武漢岩土力学研究所, 共同), Jet-Chau Wen(National Yunlin University)
Mon. May 21, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
This session provides a broad platform for discussion and presentation of fundamental and up-to-date scientific results related to clean energy production, environmental remediation and restoration, waste management, water cycle, monitoring of water quality, management of water resources and interconnections among them for sustainable development. Presentations on the topics associated with social science that enhance public awareness, stakeholder empowerment and involvement, and policy decisions regarding the management of water, energy and the environment are also encouraged.

[AGE30-P01]Modeling Natural Attenuation of Benzene compounds at an oil/gas Facility

★ Invited Papers
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Keywords:Groundwater contamination , Natural attenuation , Degradation

Groundwater monitoring is currently ongoing at a central oil and gas production facility located in Brook County, Texas. The site consists of manifolds, meters, separators, storage tanks, pumps, a glycol dehydrator, oil and water storage tanks, and a saltwater disposal well placed on a 5.4 acre caliche pad. Groundwater data has been collected at this site since the 2008 when the contamination was discovered. Currently, the site continues to operate as the central oil and gas production facility for the lease. Operations at the site have remained consistent since its initial installation. Constituents of concern (COC) for groundwater contamination include benzene, toluene, ethylbenzene, xylenes, total petroleum hydrocarbons (TPH), and chlorides that exceeded the Railroad Commission cleanup criteria. The goal is that one day the site will receive a certificate of completion from the state, which states that all non-responsible parties are released from all liability to the state for cleanup. The remediation technology that is currently being used at this site is Monitoring Natural Attenuation (MNA). A significant question is whether MNA is efficiently removing COCs in groundwater and how long will this process take to achieve the remediation goals. The objective of this study is to provide an estimate of concentrations of COCs in groundwater at the site using the BIOSCREEN model. BIOSCREEN identified that benzene will degrade in this type of environment, given the proper amount of time. The anticipated rate of decay is slower than initially estimated, however getting below RRC contaminant levels is readily achieved within 29 years of modeling. Therefore, this tool can be used as an identifier with the RRC to prove conditions exist for successful natural attenuation with a foreseeable end.