

This ITER summarizes the results of an evaluation of the AQUABOX 50 and MARABU Packed Biological Reactor technologies. The evaluation was conducted under a bilateral agreement between the United States (U.S.) Environmental Protection Agency (EPA) Superfund Innovative Technology Evaluation (SITE) program and the Federal Republic of Germany Ministry for Research and Technology (BMBF). The Stadtwerke Duesseldorf AG biological reactor system was demonstrated from July 15, 1999 through August 31, 1999 at the Stadtwerke Duesseldorf AG site in Duesseldorf, Germany.

Two packed biological reactors, operated concurrently in a side-by-side demonstration, were included in the evaluation: the AQUABOX 50 and the MARABU. The purpose was to evaluate the efficiencies of each reactive barrier to remove benzene, toluene, ethylbenzene, and xylenes (BTEX) and polycyclic aromatic hydrocarbons (PAHs) from the contaminated groundwater plume located at the site. The two biological reactors are designed to treat the influent groundwater through biodegradation by microbes that grow on the packed bed media.

Both the AQUABOX 50 and MARABU bioreactors effectively reduced dissolved-phase BTEX and PAHs from the groundwater. The removal efficiencies for the three target PAHs (acenaphthene, fluorine and naphthalene), and BTEX for the total system were all greater than 99 percent. These removal efficiencies exceeded the target removal efficiencies of 60 percent for PAHs and 95 percent for total BTEX.