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SEMINAR

GROUNDWATER PROTECTION FROM VIRUS CONTAMINATION IN THE NETHERLANDS

Jack F. Schijven
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Protection zones of shallow unconfined aquifers in The Netherlands were calculated that allow protection against virus contamination to the level that the infection risk of 10^{-4} per person per year is not exceeded with a 95% certainty. An uncertainty and a sensitivity analysis of the calculated protection zones were included. It was concluded that protection zones of 1 to 2 years travel time (206–418 m) are needed (6 to 12 times the currently applied travel time of 60 days). This will lead to enlargement of protection zones, encompassing 110 unconfined groundwater well systems that produce 3×10^8 m^3 y^{-1} of drinking water (38% of total Dutch production from groundwater). A smaller protection zone is possible if it can be shown that an aquifer has properties that lead to greater reduction of virus contamination, like more attachment. Deeper aquifers beneath aquitards of at least 2 years of vertical travel time are adequately protected because vertical flow in the aquitards is only 0.7 m per year. The most sensitive parameters are virus attachment and inactivation. The next most sensitive parameters are grain size of the sand, abstraction rate of groundwater, virus concentrations in raw sewage and consumption of unboiled drinking water. Research is recommended on additional protection by attachment and under unsaturated conditions.

Jack Schijven is a Research Scientist at the National Institute for Public Health and the Environment in The Netherlands. He received a Ph.D. from the Delft University of Technology, with honors. His research involves a combined approach of experiments and modeling, aimed to help understand the transport and removal of viruses and other waterborne pathogens in the natural aquatic environment.

Thursday, June 08, 2006
Downtown Campus, Trottier Building, Room 2100
4:00 – 5:00 pm

EVERYONE WELCOME

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