

EGU22-5660

<https://doi.org/10.5194/egusphere-egu22-5660>

EGU General Assembly 2022

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



## Challenges in modelling radionuclide transport in the German nuclear waste repository search

**Christoph Behrens**, Elco Luijendijk, Phillip Kreye, Florian Panitz, Merle Bjorge, Marlene Gelleszun, Alexander Renz, Shorash Miro, and Wolfram Růhaak

Bundesgesellschaft für Endlagerung mbH, Bereich Standortauswahl (Site Selection)

The current phase of the site selection procedure for a high-level nuclear waste repository in Germany includes representative preliminary safety assessments of potential suitable areas that cover approximately half of the territory of Germany. These safety assessments rely in part on numerical models of radionuclide transport. The modelling of radionuclide transport faces several challenges: 1) Estimation of radionuclide transport for a large set of potentially suitable areas with different hydrogeological settings and 2) scarcity of site-specific hydrogeological data for the parameters that govern radionuclide transport. To overcome these challenges we discuss potential workflows that combine the analysis of hydrogeological data and numerical models of radionuclide transport. We introduce a suite of numerical model codes that combines computationally efficient one-dimensional codes with more computationally demanding 2D and 3D codes. The 2D and 3D codes will be employed to simulate regional groundwater flow fields. These are subsequently combined with large sets of 1D model runs to quantify the effects of parameter variation and future geological developments on radionuclide transport. We discuss methods to combine site-specific data with global data to constrain the bandwidths of hydrogeological parameters and the range of radionuclide transport. Our contribution aims for an open discussion of model strategy and exchange with the scientific community.