

MASOM to carry out Radiological Impact Assessment (RIA) of NSDF through Groundwater Drinking Pathway

The low level solid radioactive waste is generally disposed in Near Surface Disposal Facilities located within the NPP site. Depending on the waste characteristics, the disposal is carried out in different disposal units such as stone lined trenches (SLT), Re-enforced concrete trenches (RCCT) and tile holes. For RIA of such waste disposal modules, a Multiple Area Source Model (MASOM) is developed which includes a source term model for the estimation of activity leaching out from these different disposal modules and a two dimensional advection dispersion model for the migration of radionuclides with the groundwater. The model also incorporates the progeny production in case of radionuclides involving long decay chains where it estimates the activity of the daughter products produced due to decay of the parent in the source as well as during transport at different time frames using Bateman equation.

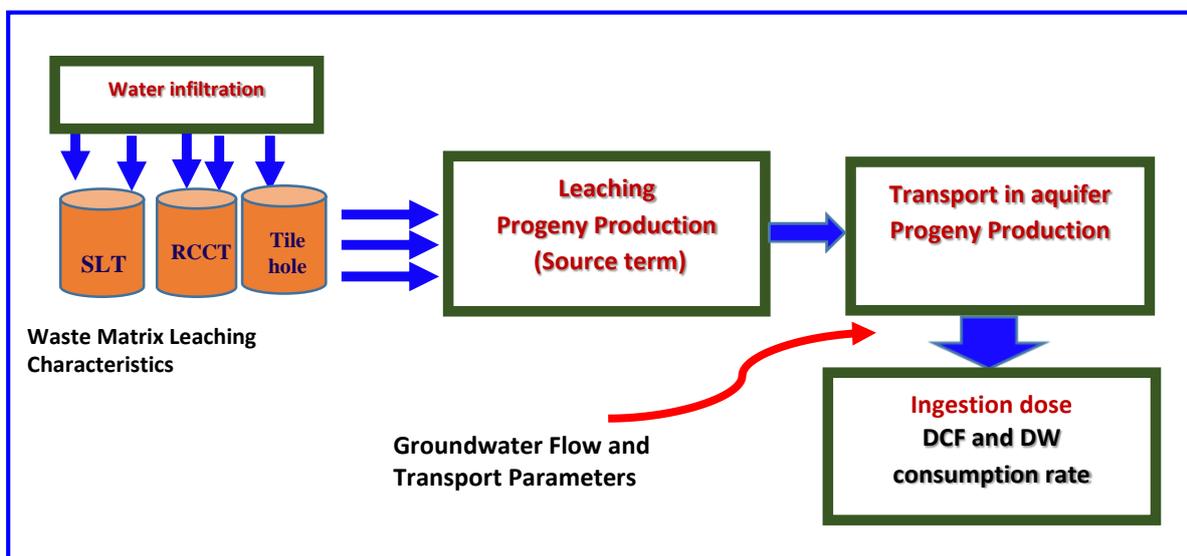


Figure-6: Block diagram for Radiological Impact Assessment through groundwater pathways

Numerical modeling for radiological impact assessment (RIA) of Turamdih tailings pond in Jharkhaand, India

Tailings ponds are the above surface waste disposal facilities close to mining sites where the waste generated during the milling process is disposed. The numerical modeling study was carried out for such tailings pond at Turamdih, Jharkhand, India. The watershed area comprising the tailings pond was characterised by carrying out hydrogeological characterization of the area. Then the generated hydrogeological data was utilized in simulating the probable leaching of radionuclides from the tailings pond and their further transport along with groundwater using a Finite Element subsurface FLOW (FEFLOW) model. The production of progeny radionuclides from parent uranium was also incorporated. The spatial and temporal profiles of concentrations of radionuclides were estimated and these are then translated into dose to the members of the public through groundwater drinking pathway. Through this study, it was demonstrated that in an unlikely event of leaching of radionuclides from the tailings pond, the resulting dose to the public will be well within the WHO guideline of 0.1 mSv/year.

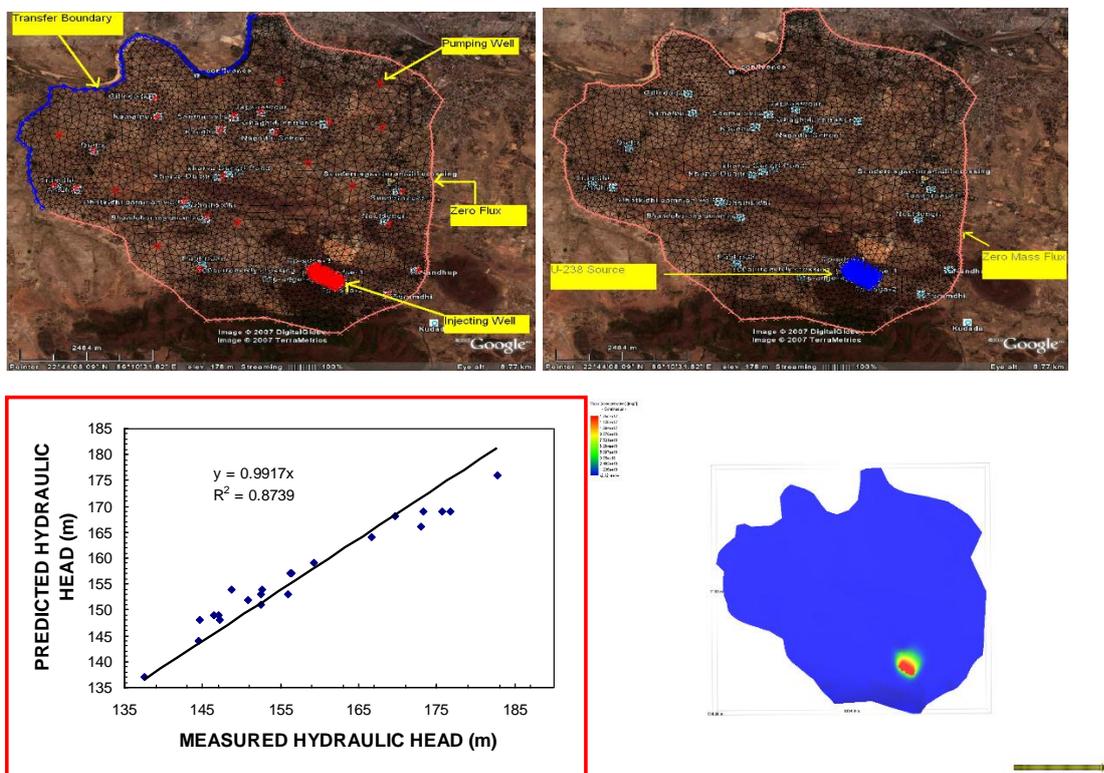


Figure-9: Numerical modeling for radiological impact assessment (RIA) of Turamdih tailings pond in Jharkhaand, India