

## Subsurface Contaminant Transport Analysis for Flowpath Direction in Katni Watershed, Madhya Pradesh, India Using GIS and Groundwater Modeling Approach

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### Abstract

The current study aims to identify the pathways of pollutants and travel time of contamination using Remote Sensing and GIS approach. In sight of this, to evaluate hazard, groundwater contaminant transport is analyzed by using the ground water model in Katni River watershed. Darcy flow and velocity have been used for contaminant transport analysis, which is one of the components of Arc GIS in Groundwater module extension. Modeling tools such as Kriging, Darcy Flow/Velocity and Linear Directional Mean were used to identify the groundwater path lines and travel time. The analysis was done by taking into account of vulnerable areas, the location of contaminant sources and infected wells and their well field. The hydro-geological properties of underlying rocks along with surface and groundwater elevation are also considered by simulations, found that flow lines intersect with the Katni River in numerous places and flow lines converge towards wells in the study area, implying contaminated water is carried to these areas from all directions. Consequentially, the quality of the surface and groundwater is determining the quality of water in the wells

**Keywords:** Contaminant Transport Analysis, Pathways and Travel Time, Groundwater Flow Model, Darcy Flow, GIS, Kriging

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