

DEVELOPMENT OF NUMERICAL MODELS FOR DETAIL (LOCAL SCALE) SIMULATION OF SOIL WATER DYNAMICS INCLUDING PREFERENTIAL FLOW EFFECTS – TOOL

RIVER BASIN MANAGEMENT ISSUE										
Water Quality					Water Quantity		Alterations		Others	
1	2	3	4	5	6	7	8	9		10
C, T										
(1) Diffuse pollution by agriculture (3) Contaminated sediment and floodplain soils (5) Pollution by organic matter (7) Water scarcity (9) Hydromorphological alterations					(2) Salinisation (4) Large scale pollution due to past mining / industries activities (6) Emerging compounds (8) Floods and low flow (10) Soil erosion					
C = System Characterisation T = System Trend					M = System Monitoring R = System Remediation, Mitigation					
RIVER BASIN										
Danube	Ebro	Meuse	Elbe	Brévilles	Others					
			✓	✓	Not river basin specific					
Spec. : Results specific to selected River Basin										
KEY FINDING TYPE										
Laboratory based				Field based			Modelling			
							✓			
BENEFITS TO END-USERS										
Technical		Management		Policy						
WFD Implementation	Research	River Basin	Compliance	Policy making						
	✓									

INTRODUCTION

COMPUTE 1 deals with small scale modelling of the water flow and solute transport in the unsaturated zone. Models developed by COMPUTE 1 take into account the heterogeneity of the soils by including a **dual porosity (soil matrix and preferential pathways)** approach.

TOOL SUMMARY

S1D integrating double porosity approach (soil matrix and preferential pathways) can model 1D vertical water flow and contaminant transfer in the vadose zone. This model can be used for any contaminant as long as there are single species contaminants. The model enables to model the soil hydraulic processes and the contamination transfer (contaminant breakthrough) very accurately especially during storm event. However, it is very data intensive model and only applicable at the local or site scale. It can only be used by scientists.