ENVIRONMENT AGENCY

The University of Birmingham

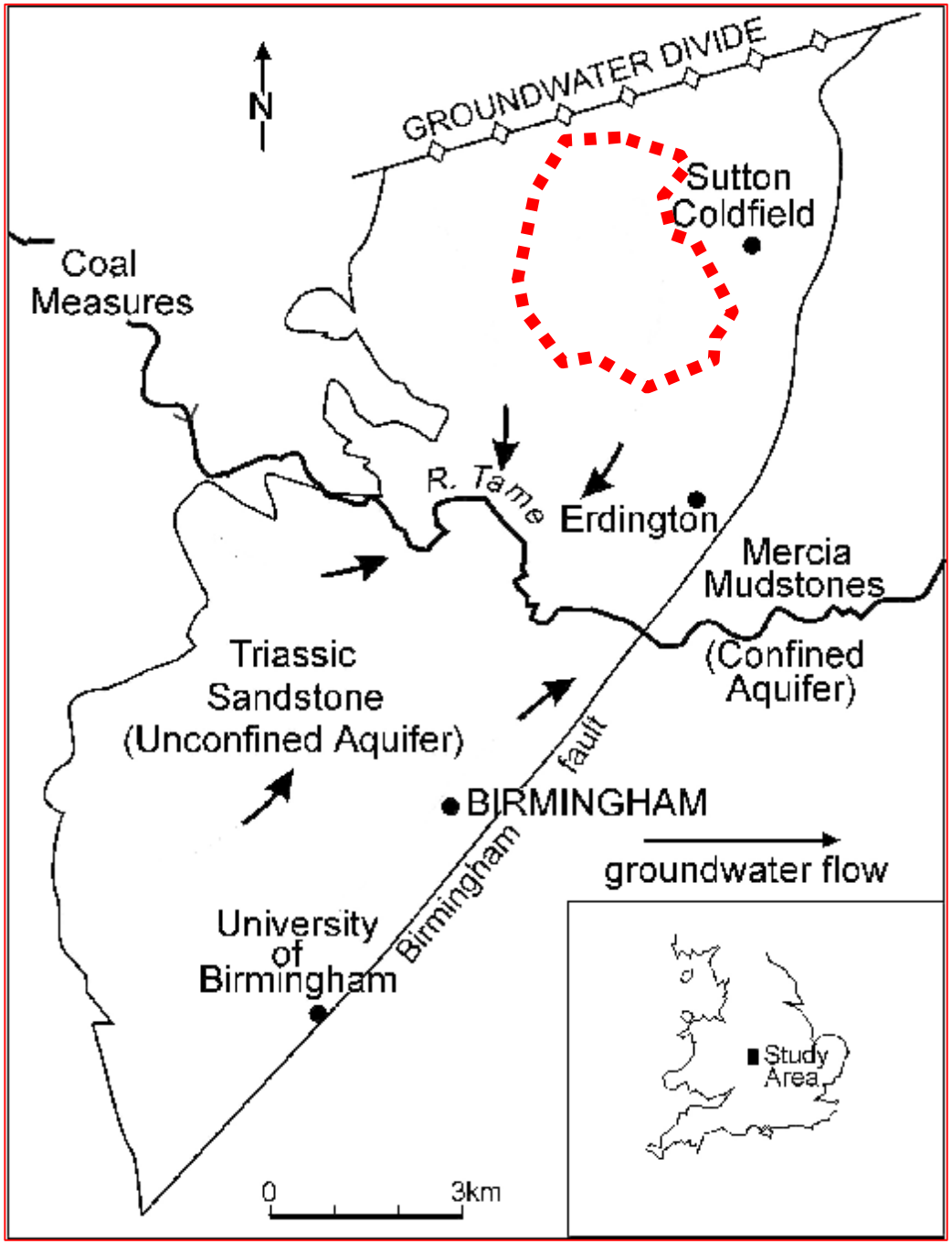
Modelling urban river-aquifer interactions, an industry perspective

Dr Paul Ellis

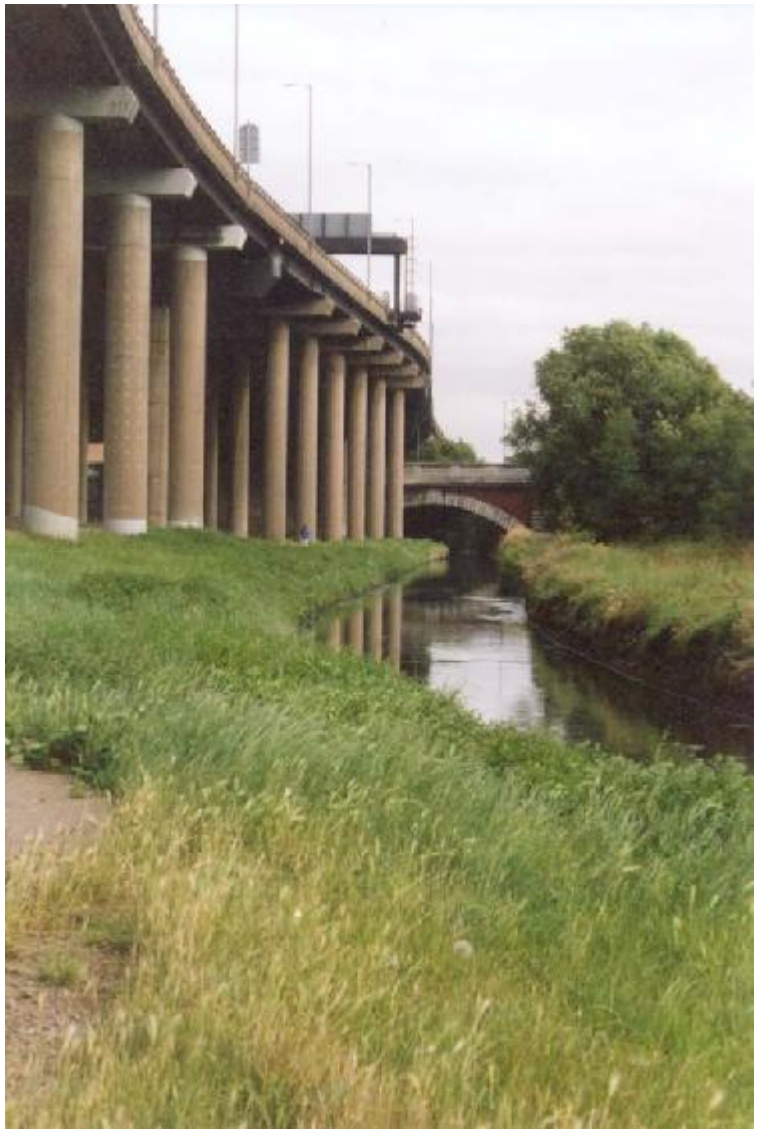
Hafren Water

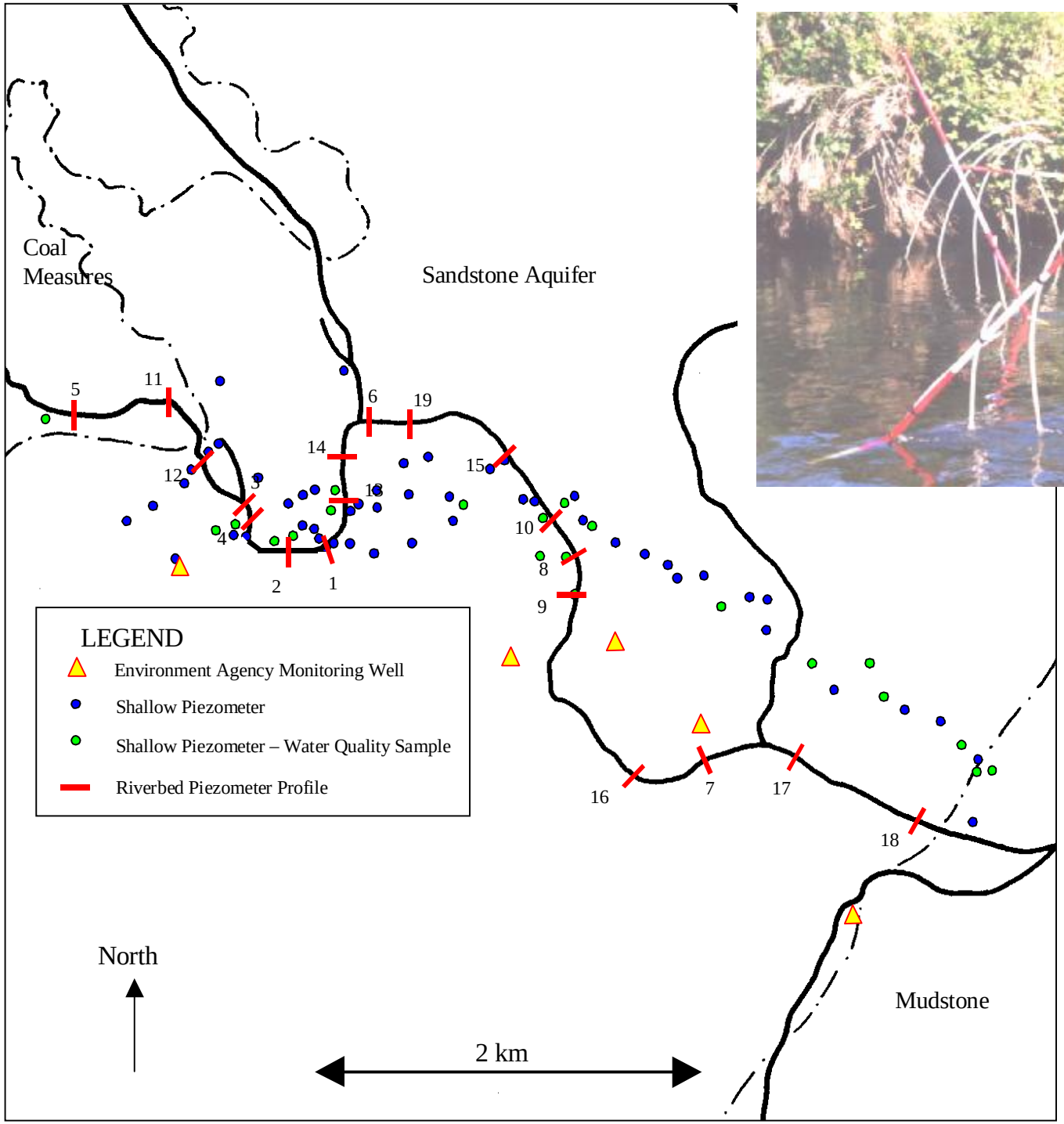
Objectives

- To examine the impact of urban groundwater upon surface water quality
- To present a selection of field data to illustrate some of the groundwater surface water quality interactions taking place
- Discuss management applications of HZ modelling



River Tame



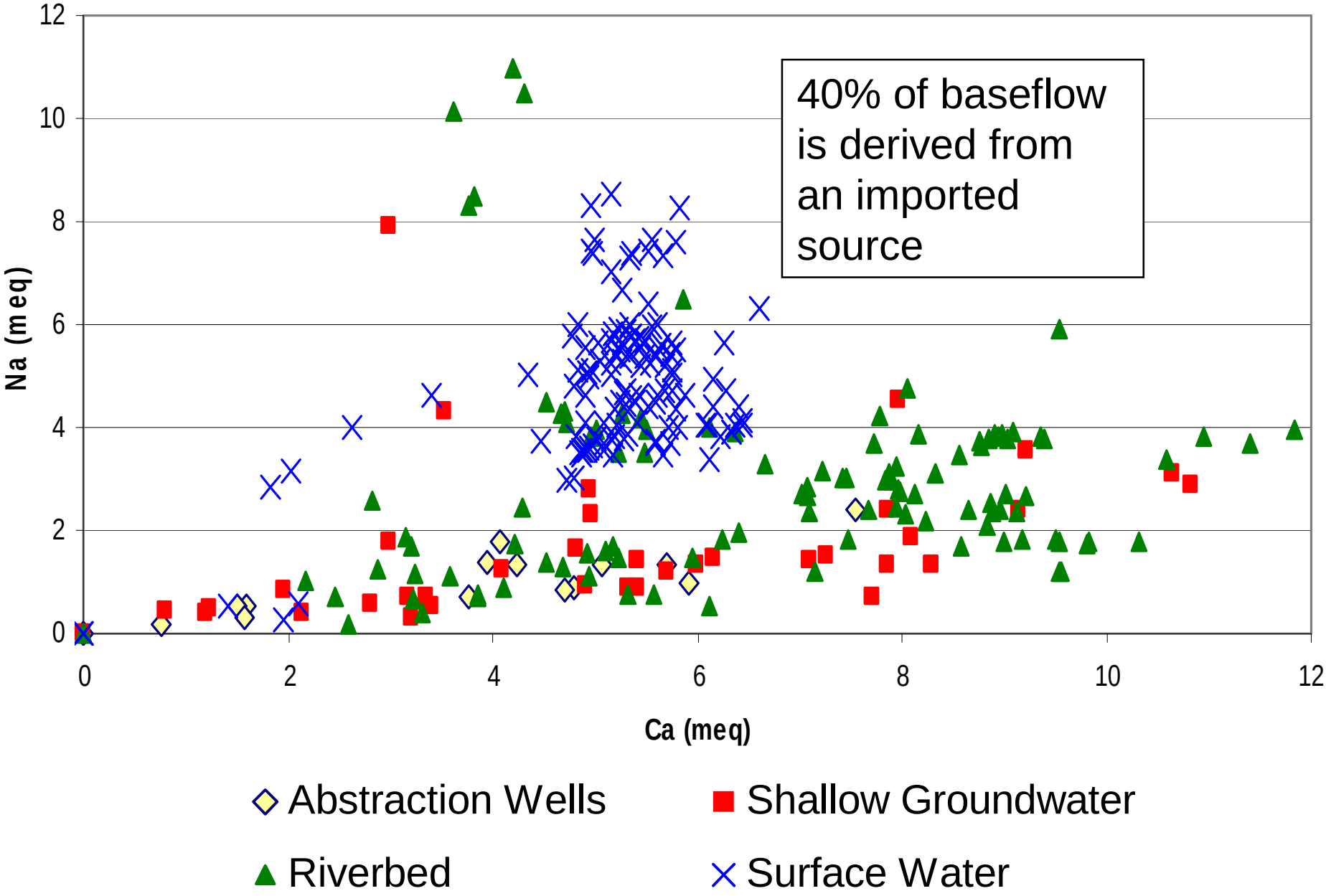


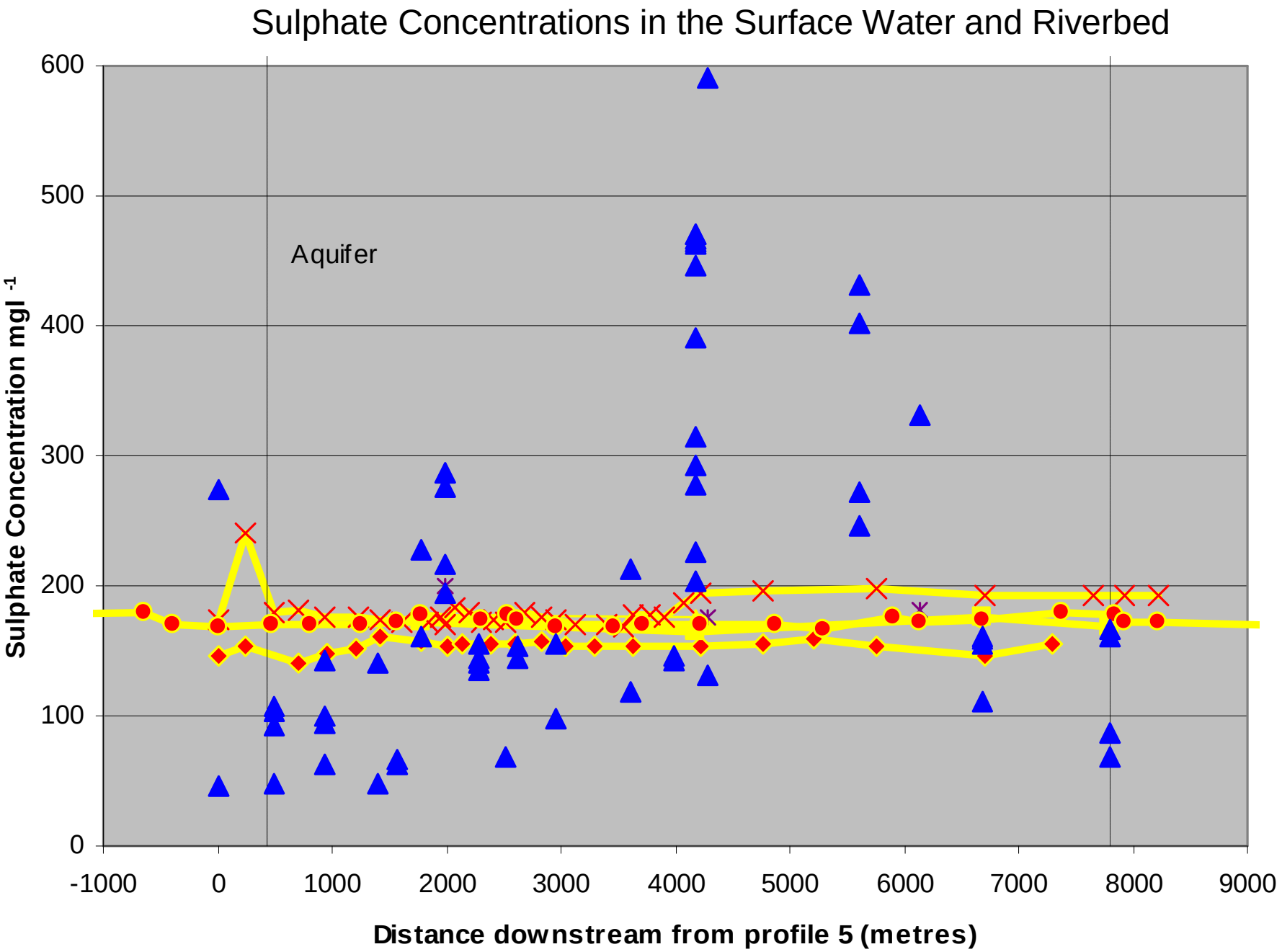
408 km^2

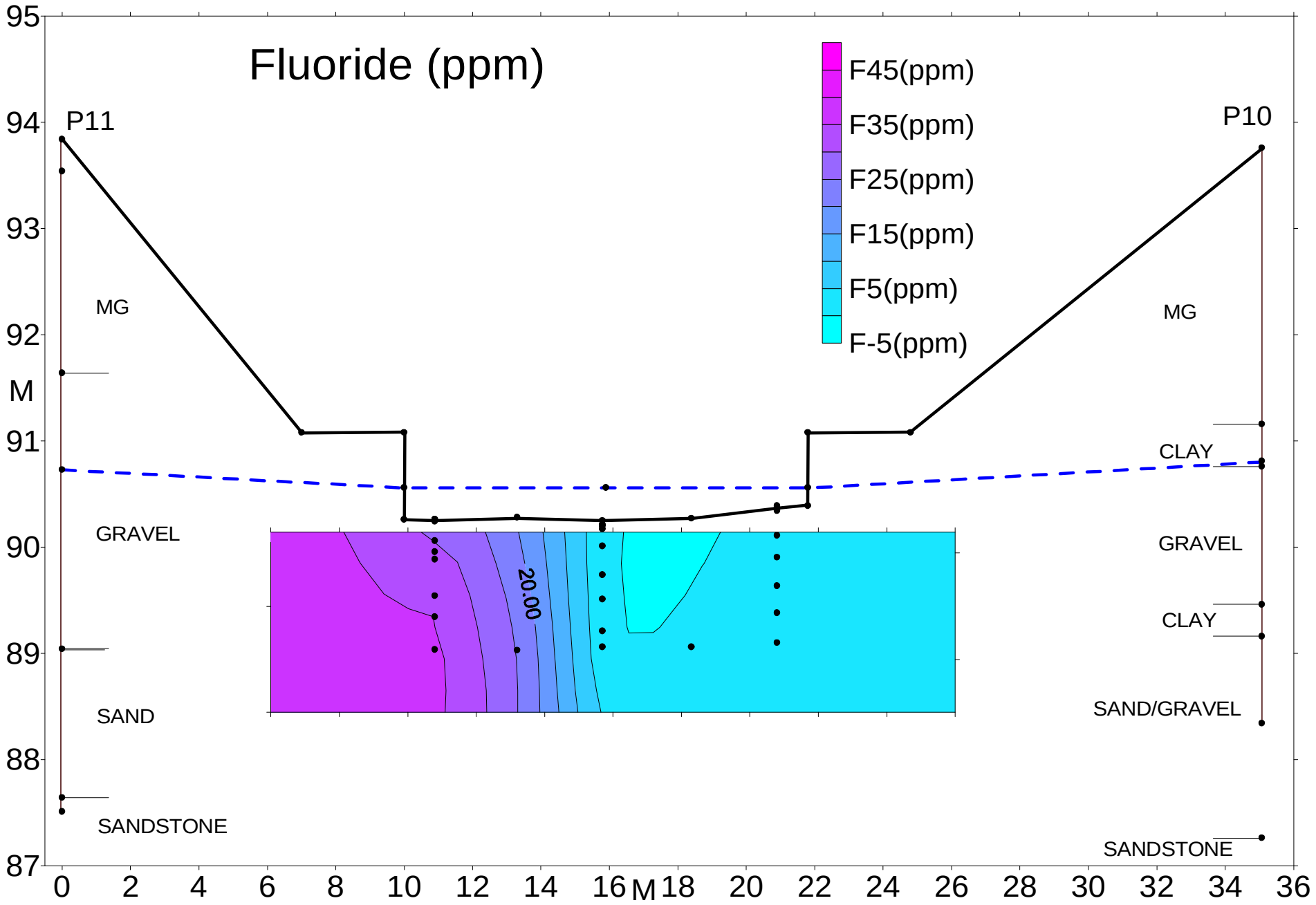
6% Base flow

300 ML/d

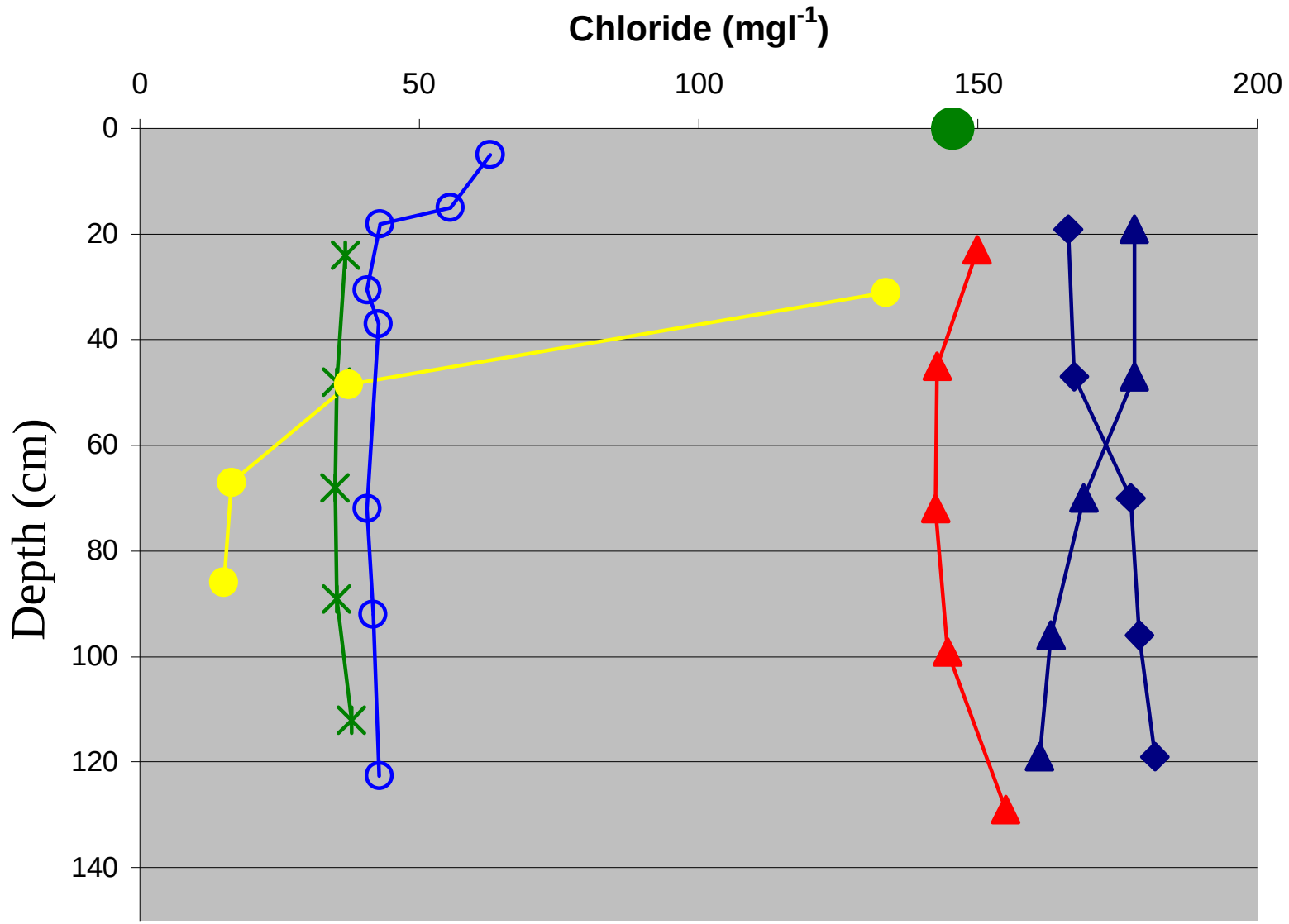
Water Quality Data 2000 and 2001





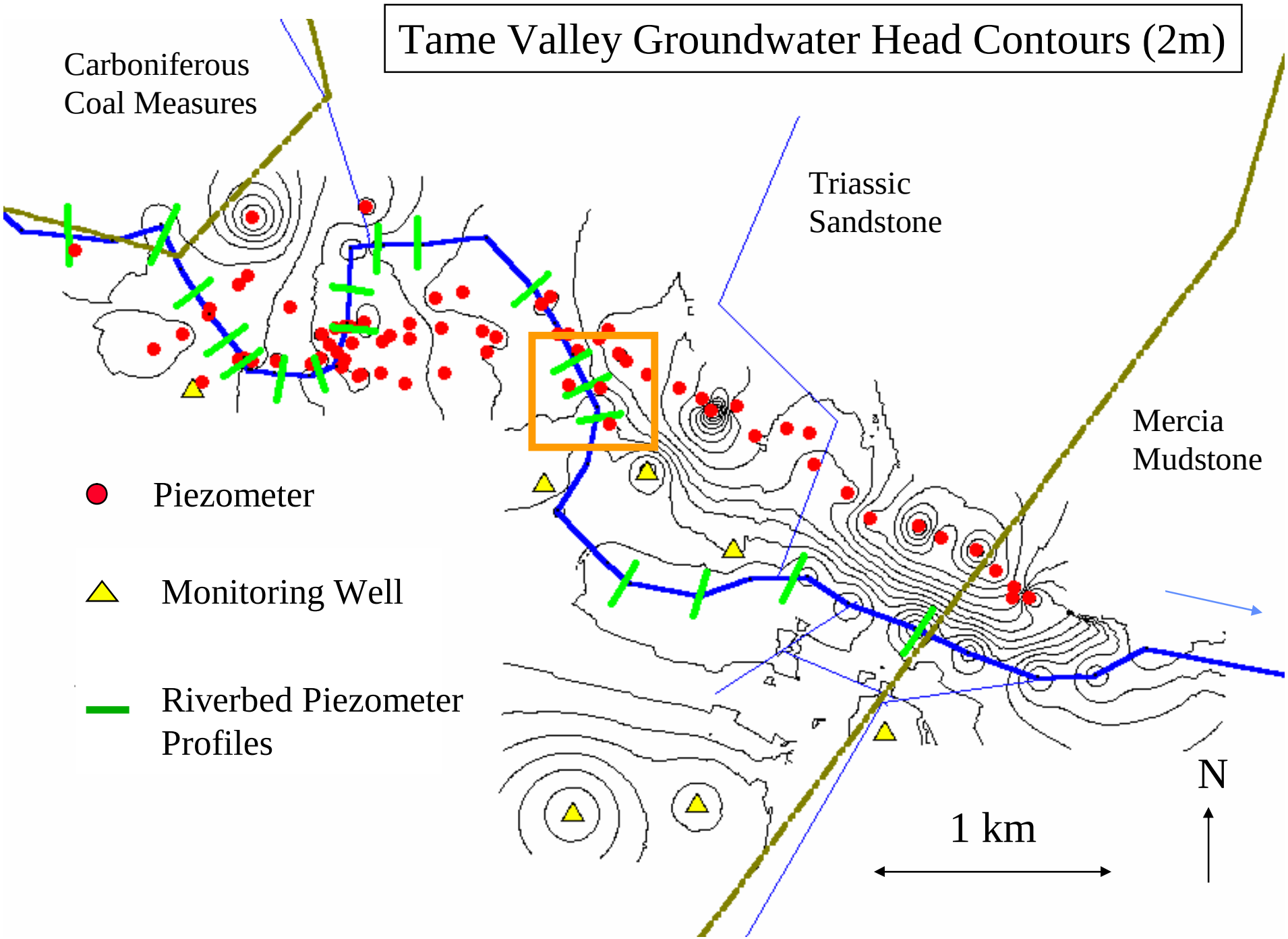


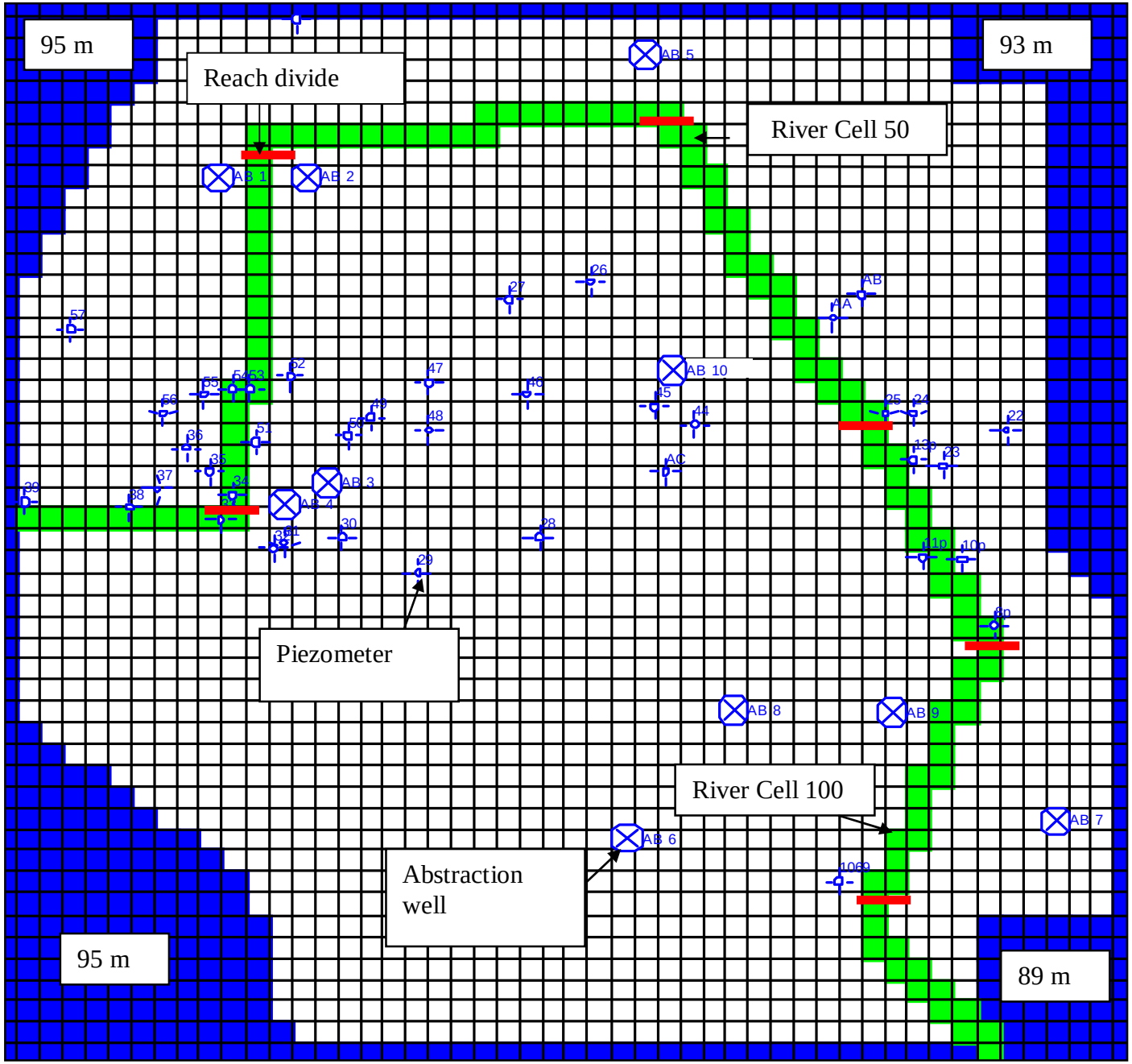
Multilevel Piezometer Concentration Profiles within the Riverbed



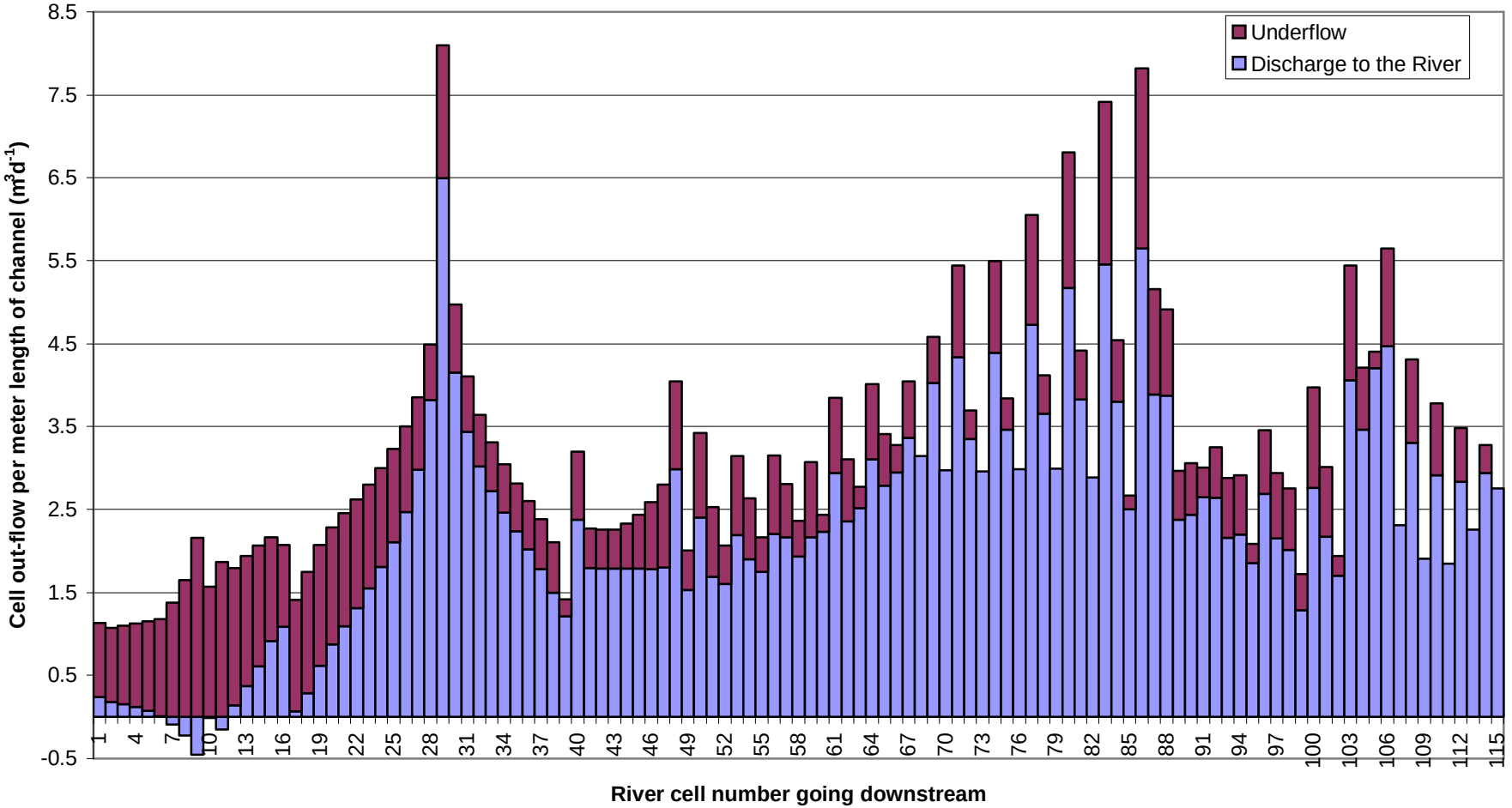
5 m^3/day per meter of channel

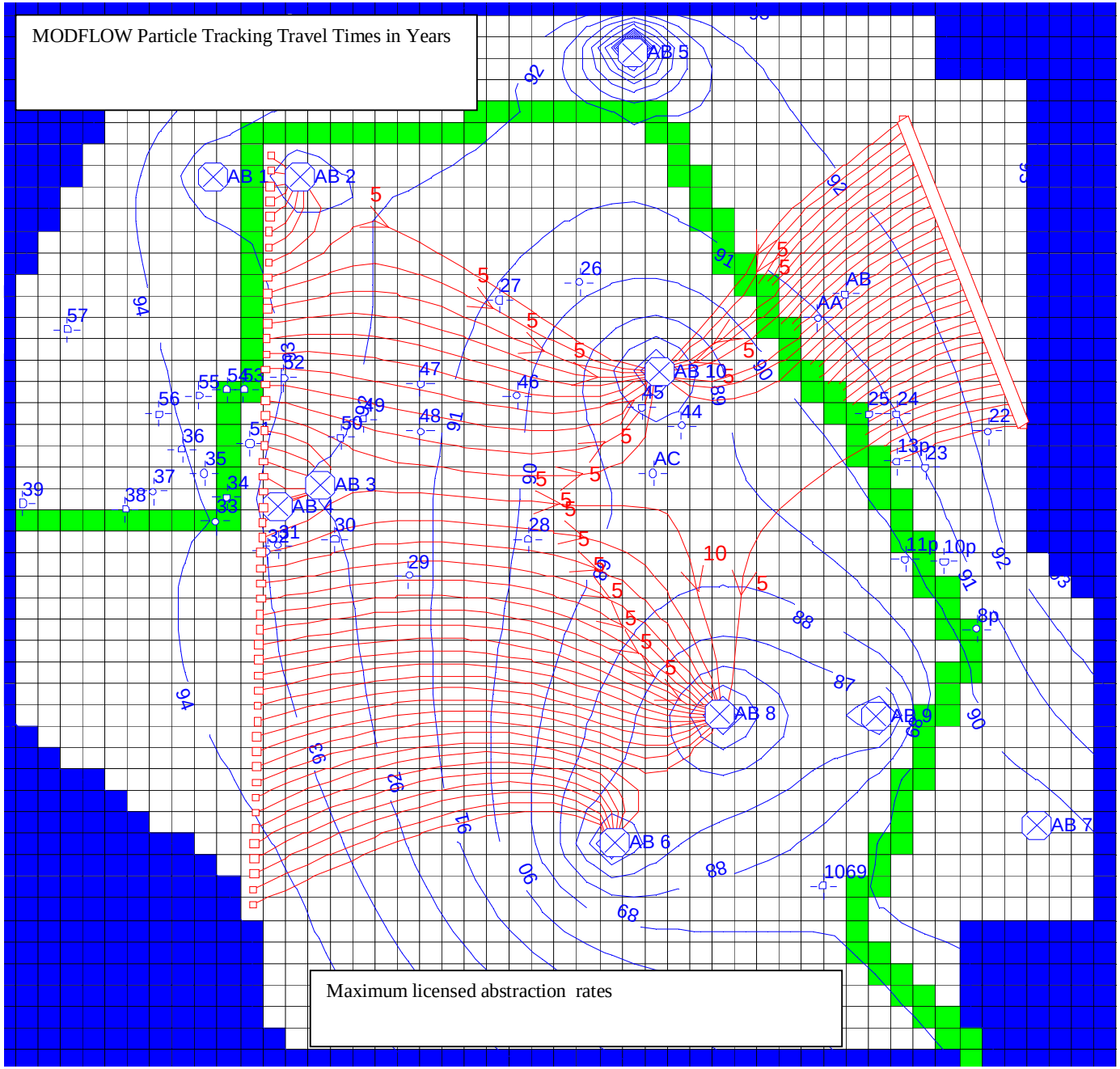
Max Specific discharge 0.43 m/day

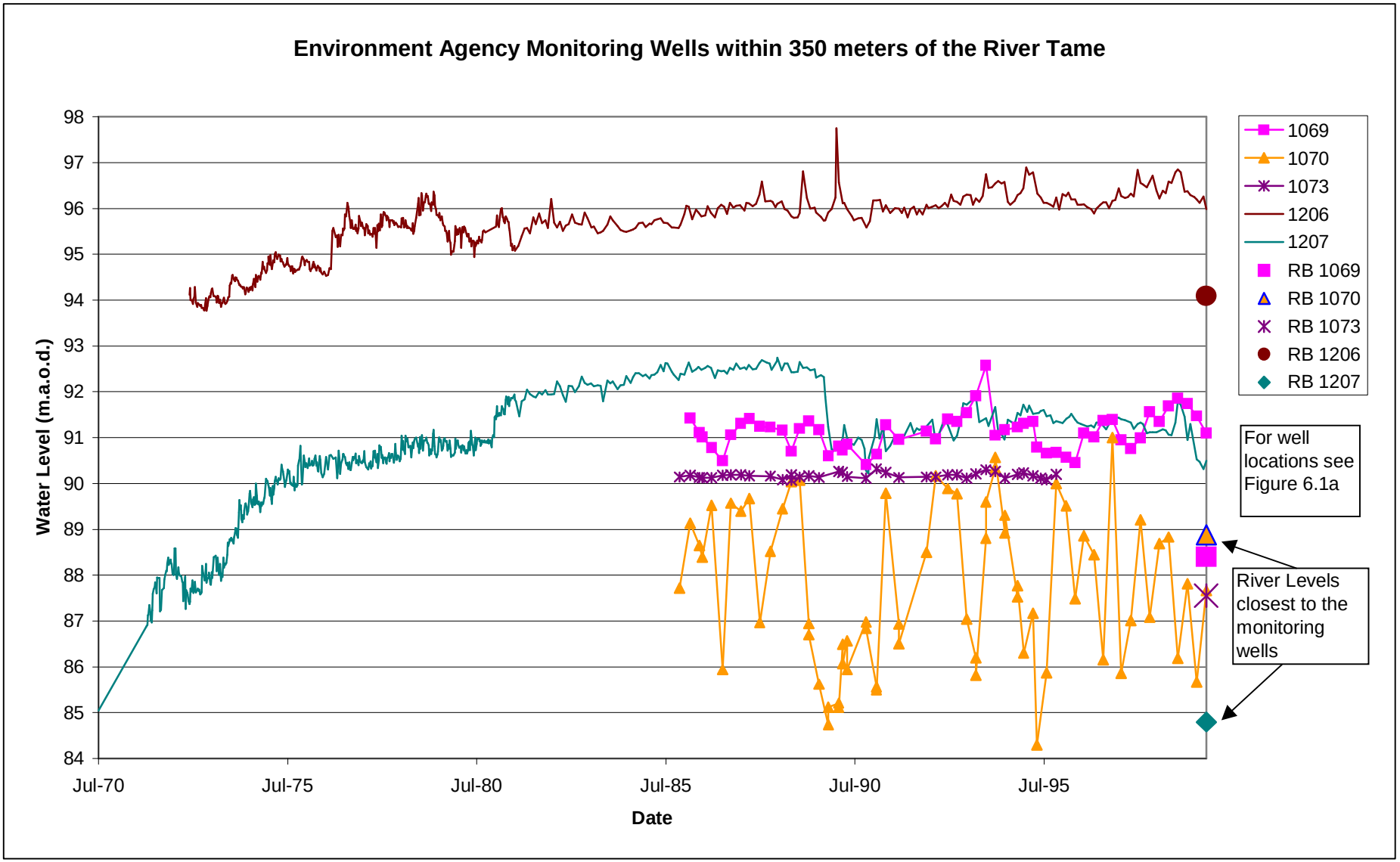


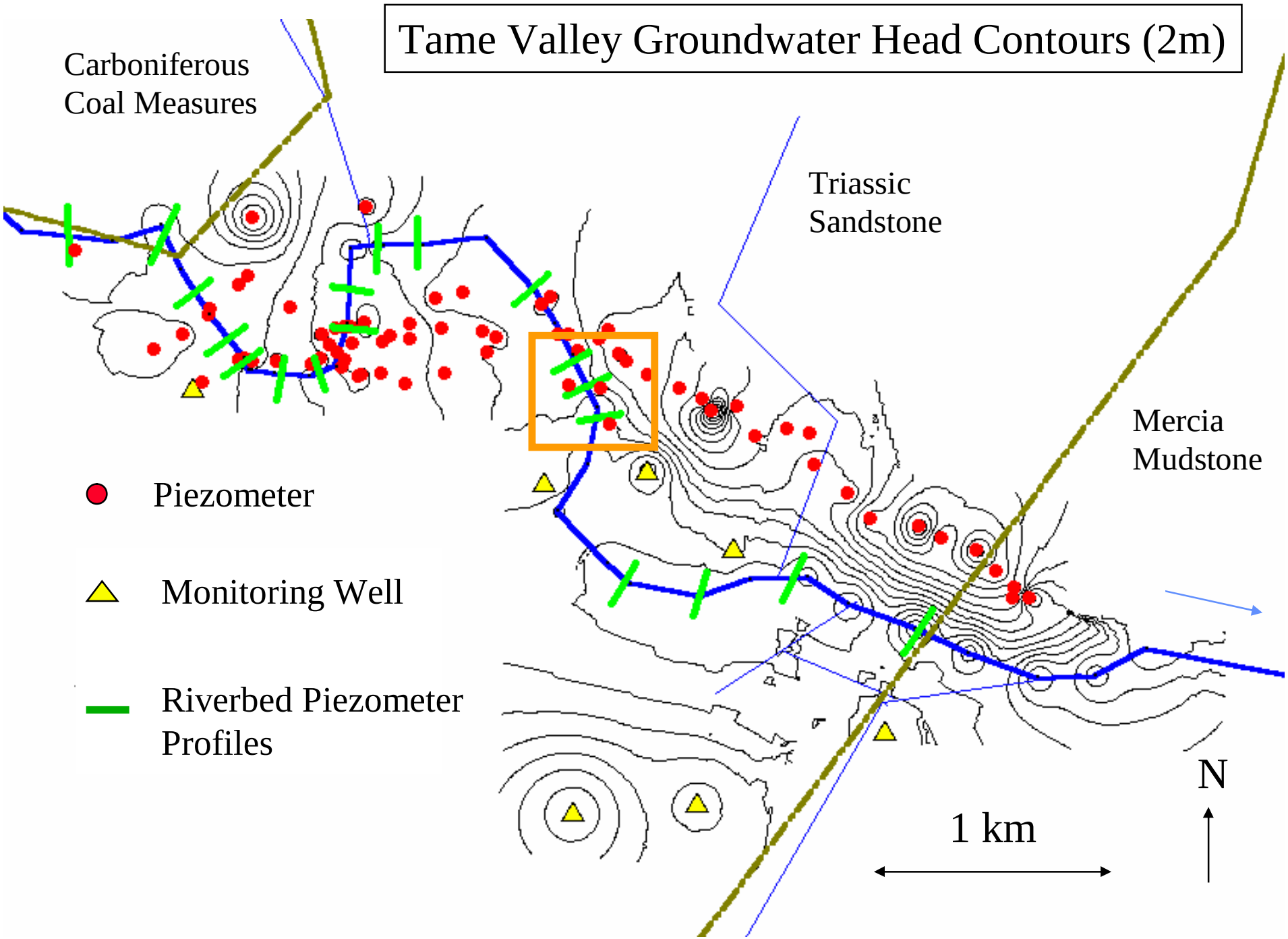


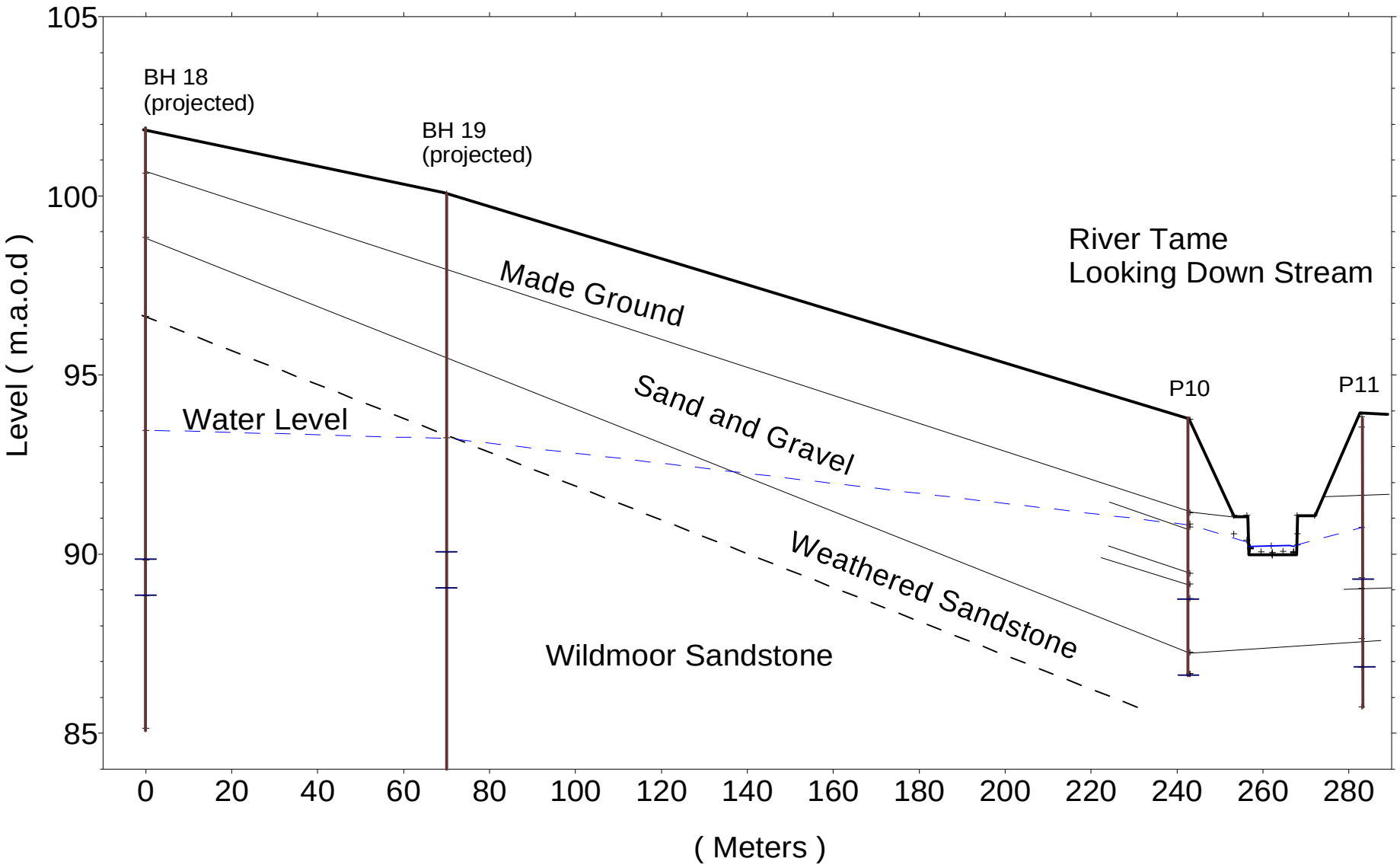
Total river cell out-flow expressed as underflow and discharge to the river per meter length of channel

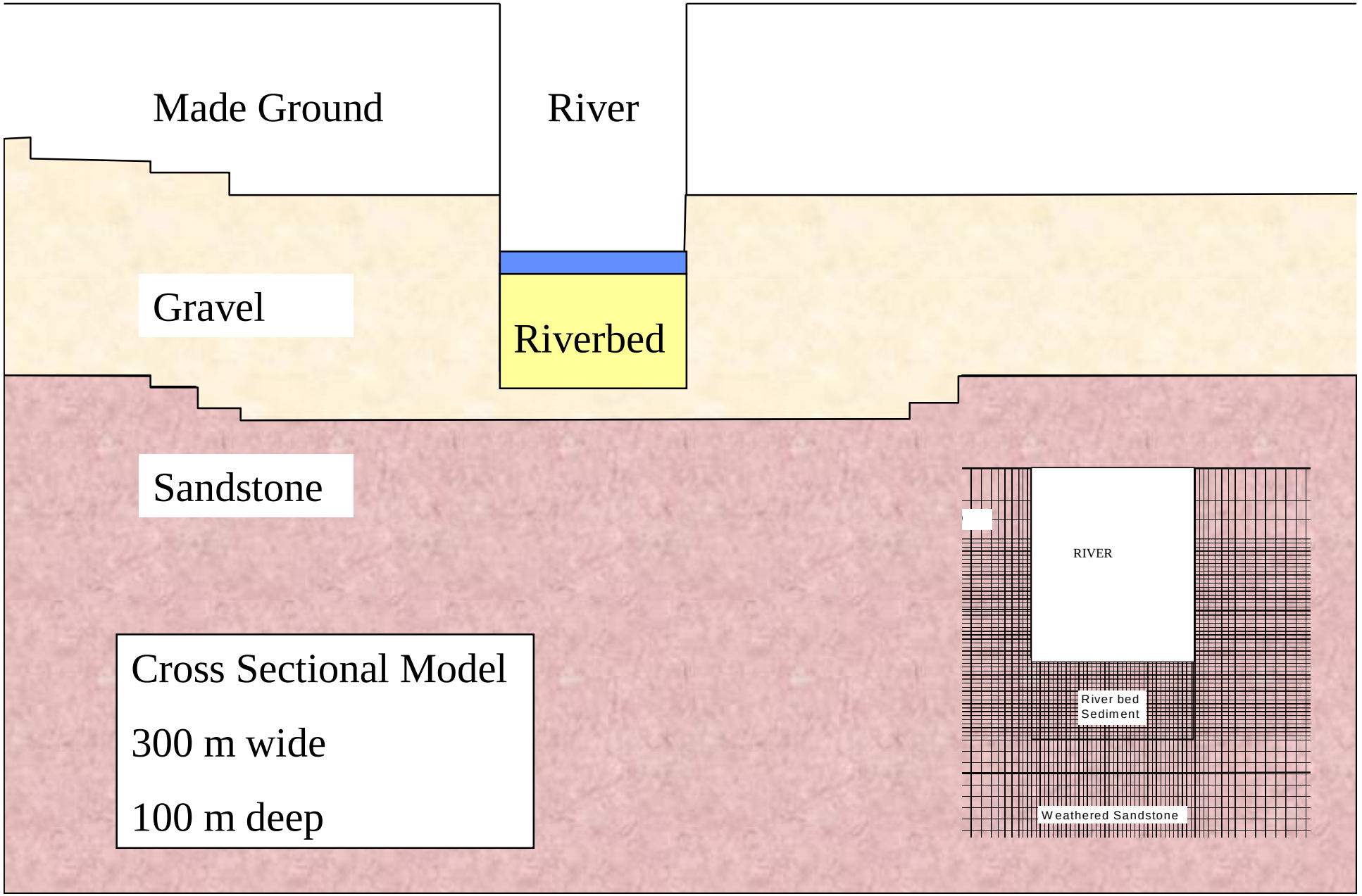




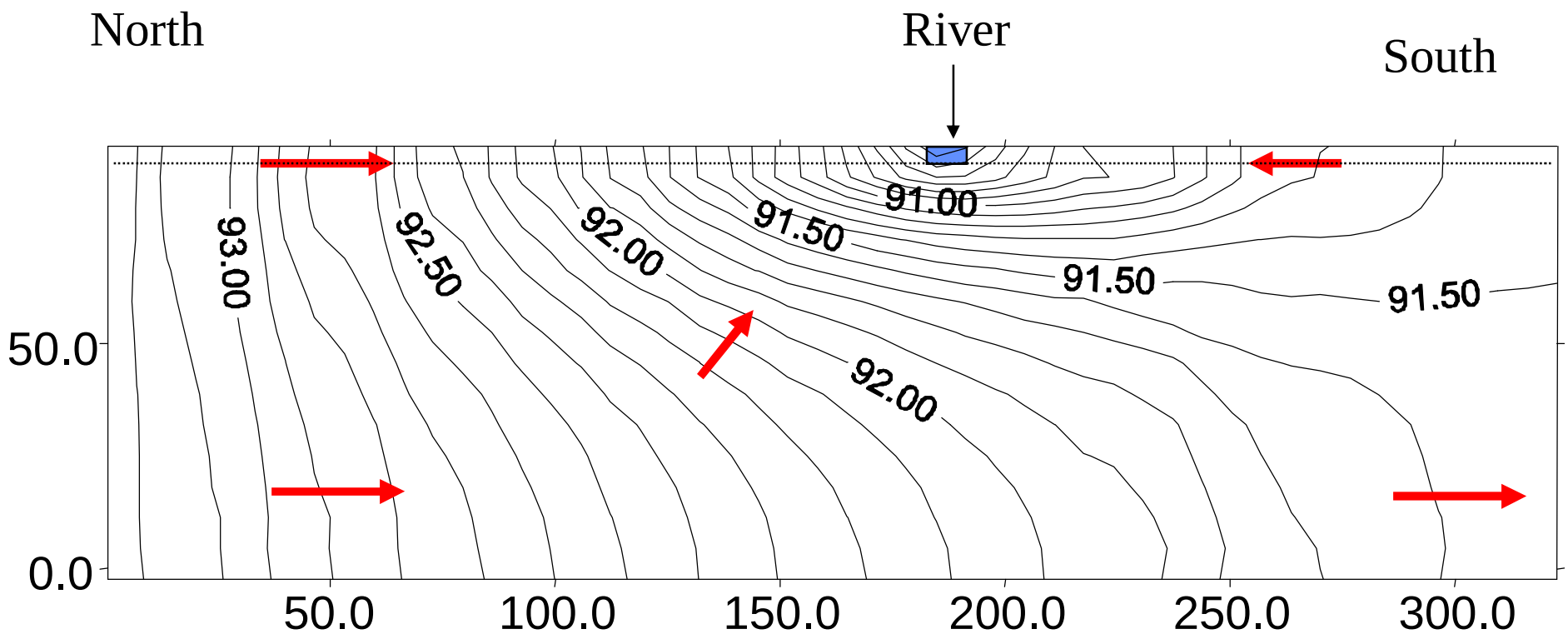




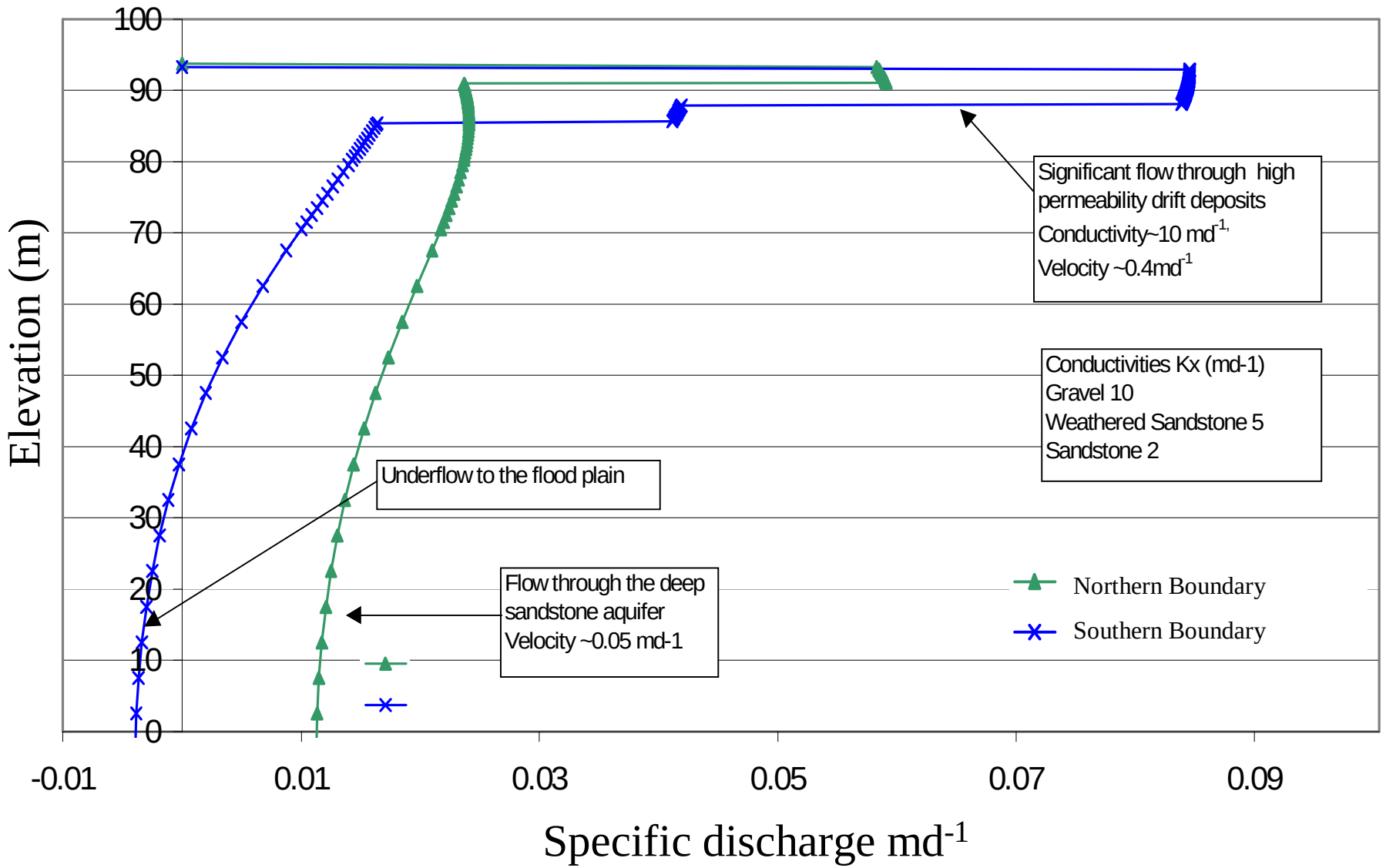


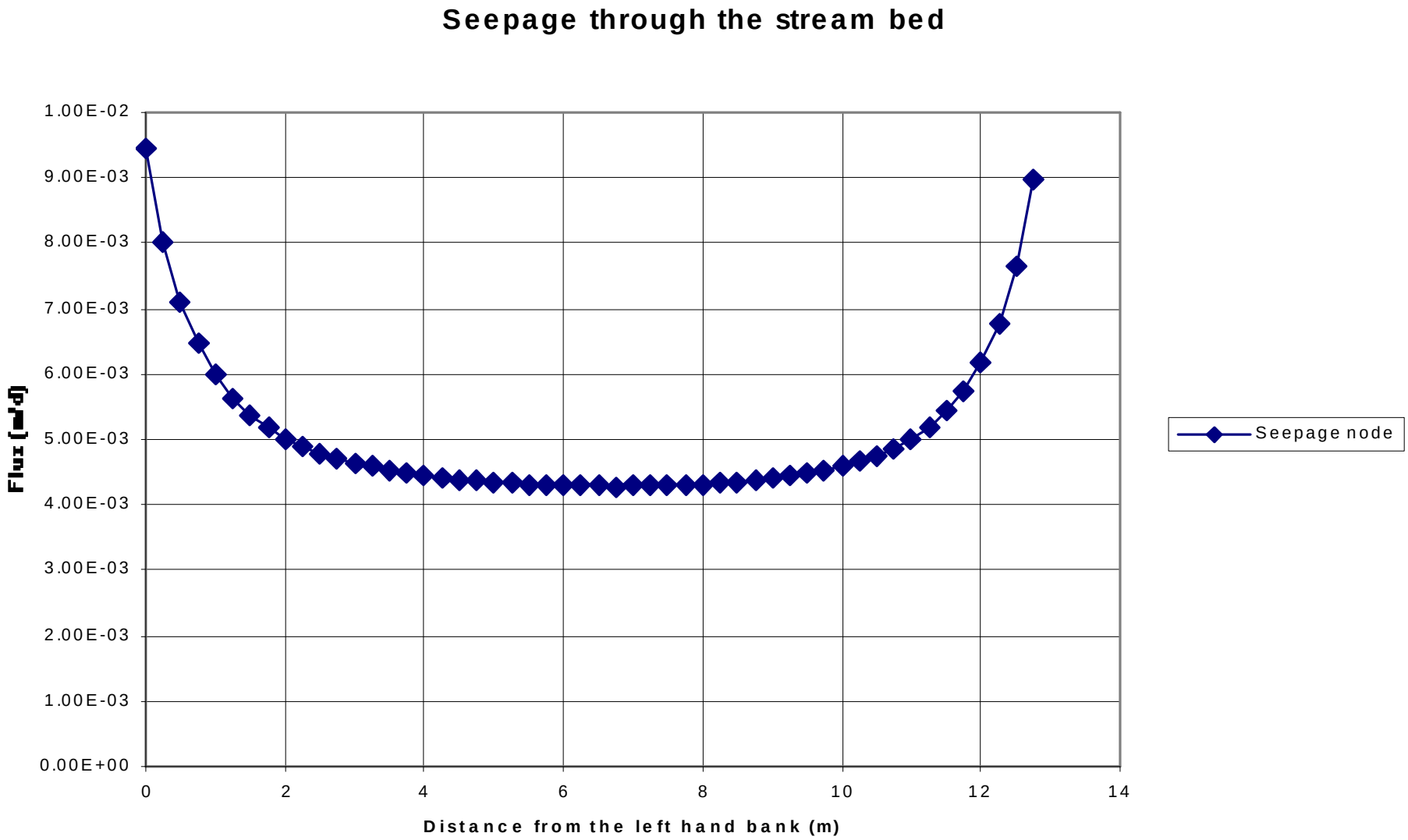


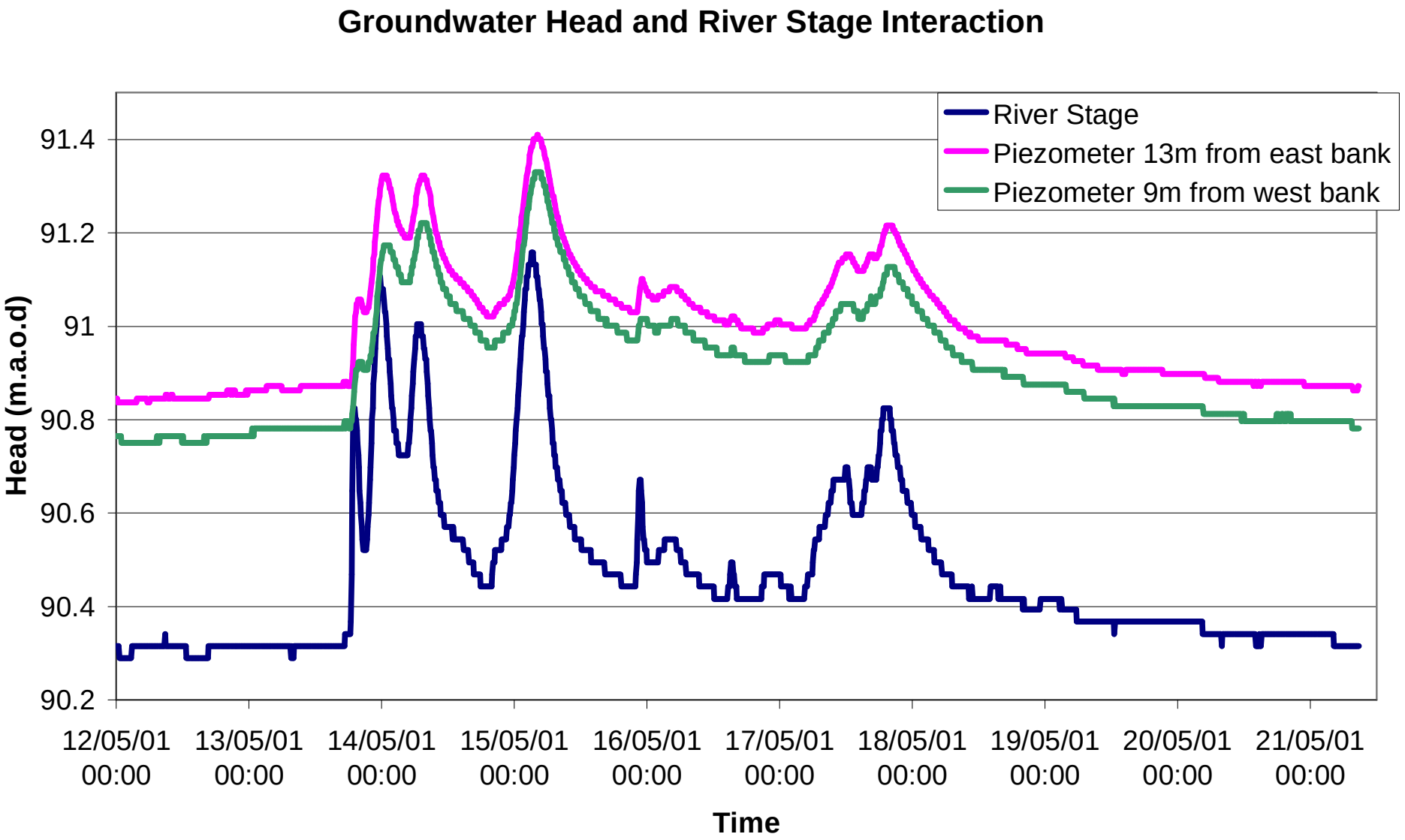
Model cross section showing head contours and flow directions

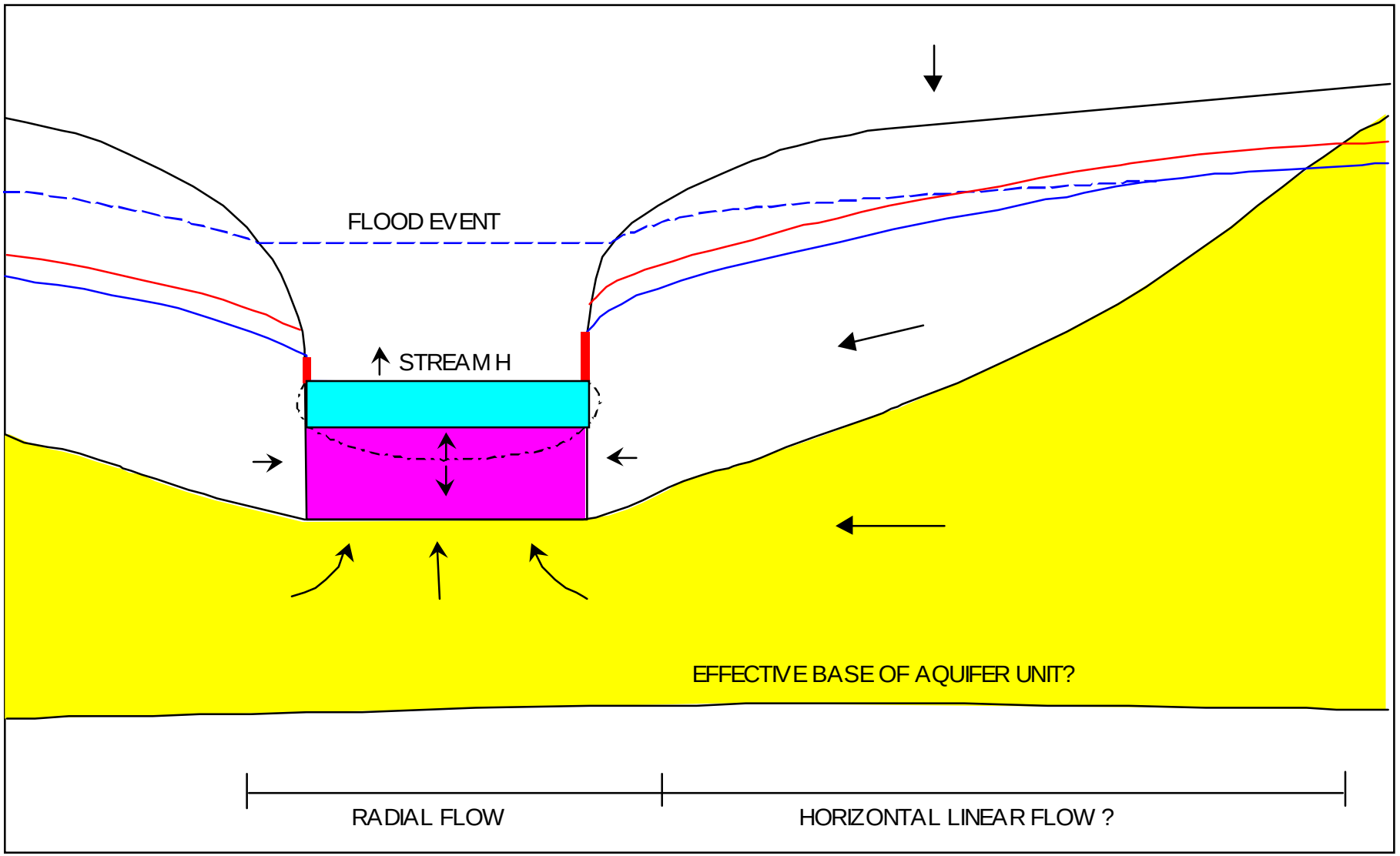


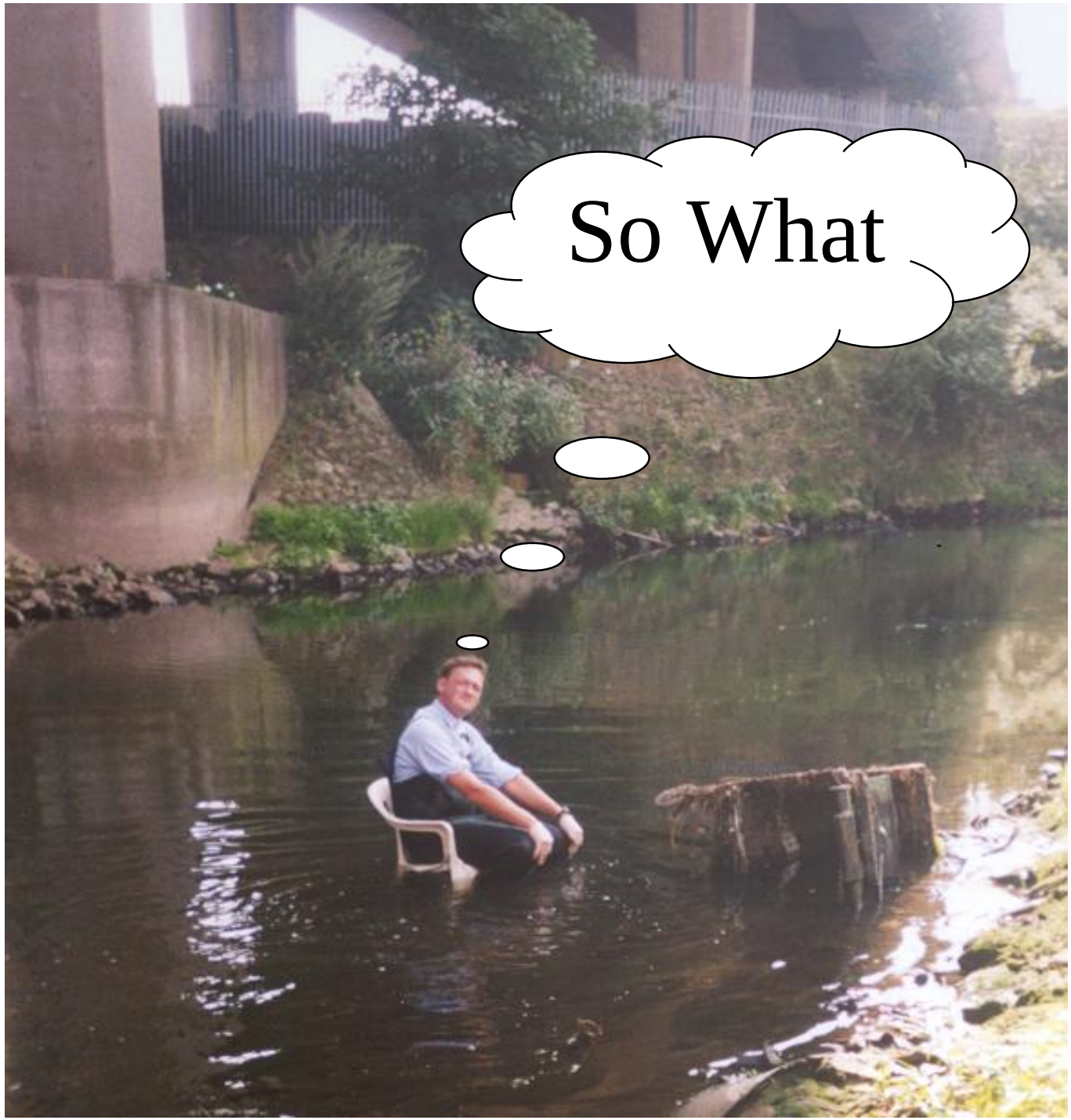
Specific Discharge Across Model Boundaries











Why should managers be interested?

- Industry – will be interested if drivers are set eg in Abstraction licence, discharge consent.

- Regulators – WFD, river status (part of the puzzle)

Management requirements

- Prediction,
- Requires coupled models, SW&GW
- Flow, Quality, Levels,
- Impacts, limits on stresses, sensitivity
- Who caused the problem
- Remediation Strategies

Conclusion

- HZ a small part of GSI which is important to managers, need to recognise/quantify a value.