



**PROJECTS**

**GIS & OTHER PROJECTS**

HydroSOLUTIONS

HydroSOLUTIONS GIS6



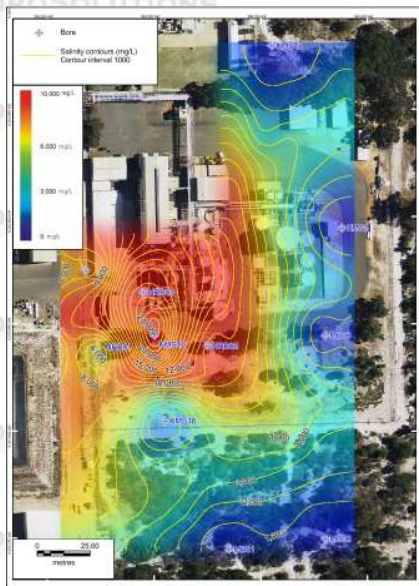
GIS study, Review of Groundwater Remedial Strategy, Saline Plume beneath a Chemical Manufacturing Plant, WA

Groundwater beneath an operational chemical manufacturing plant has been impacted by the loss of process brine over a twenty-year period. This has been managed by recovery pumping with off-site disposal, and a program of leak-sealing and plant maintenance.

Recently concerns have arisen over the effect of on-going groundwater abstraction and dewatering leading to the generation of acid sulfate soil (ASS) impacts on groundwater quality within the superficial aquifer. The regulator has requested that a review of on-going management by abstraction recovery should be undertaken to establish whether it needs to continue or can be scaled back to reduce potential ASS impacts.

Geographical Information System (GIS) data were acquired and generated to assist with the development of a time-dependent database containing the following datasets for analysis:

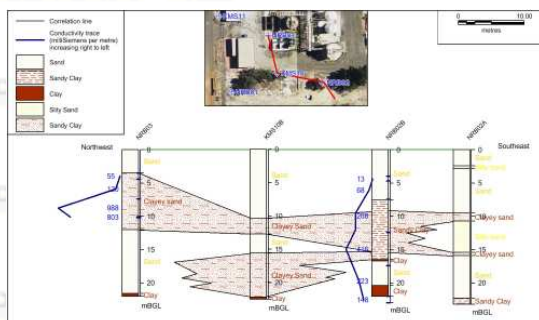
- digitization of infrastructure features and key locations on-site
- compilation of all existing and disused bore location data
- compilation of all available historical groundwater levels
- spatial and temporal cross-referencing of salinity data on-site
- preparation and analysis of salinity concentration contours for the history of the remediation period, using multiple algorithms
- cross-referencing of all available down-hole data and geophysical depth data



The GIS analysis has enabled the most up-to-date estimate of salt losses to the groundwater via volume integration of salinity concentrations over time. Comparison with pumping rates has enabled new estimates of salt recovery efficiency. In addition, spatial constraints on the limits of the plume for various salinity trigger levels were identified. It was concluded that the plume has not been contained in every direction, but has migrated off-site under the influence of nearby abstractions.

Recommendations were made for:

- Further hydrogeological investigation to better characterise the site, including test-pumping and an ASS investigation
- Additional geophysical surveys to locate new monitoring bores
- Collation of data regarding local abstractions
- Construction of a numerical groundwater model to assist in improvements to targeted containment & recovery
- On-going leak sealing
- Risk assessment
- Eventual cessation of pumping



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