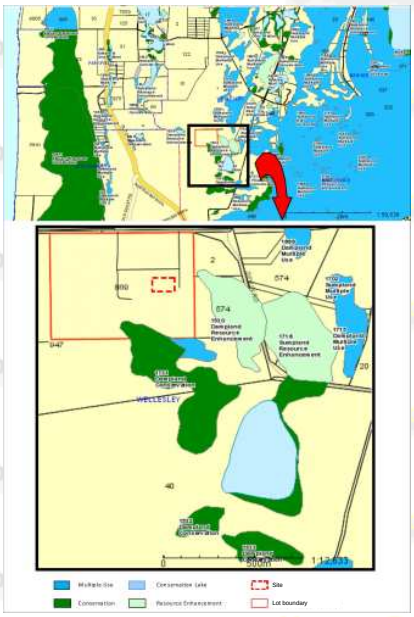
HydroSolutions Pty Ltd

Hydrogeological & Environmental Consultants

PROJECTS

SITE REMEDIATION

SiteRem7

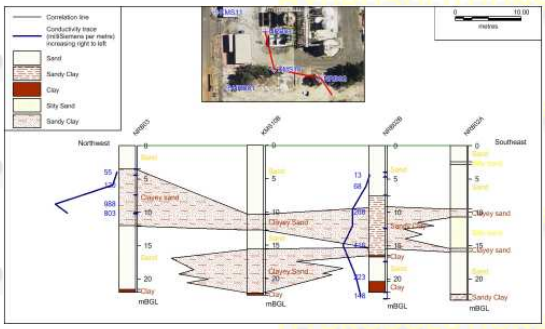


Review of Groundwater Remedial Strategy, Saline Plume beneath a Chemical Manufacturing Plant, WA

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.

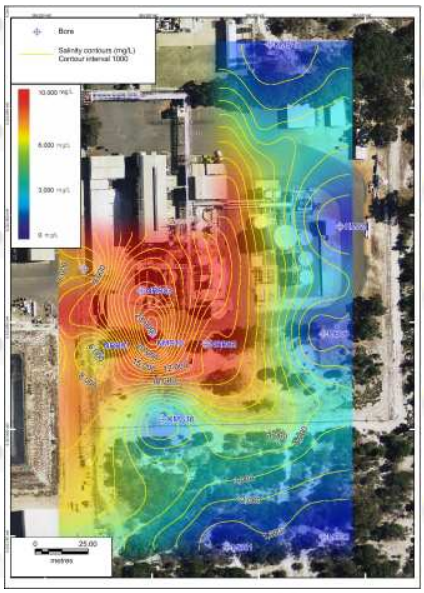
Recently concerns have arisen over the effect of on-going groundwater abstraction and dewatering leading to the generation of acid sulfate soil (ASS) impacts on groundwater quality within the superficial aquifer. The regulator has requested that a review of on-going management by abstraction recovery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

Unconfined groundwater flows to the southwest and discharges into fresh water wetlands and other surface water features. Groundwater within the superficial sands and clays is in hydraulic-continuity with the underlying unconfined or semi-confined Leederville aquifer. Groundwater abstraction occurs from both units locally and regionally for contaminant management, process and potable water supplies.



The history of brine and salt loss was reviewed, and estimates were made of the historical and current rate of loss from monitoring records.

Historical and on-going abstraction recovery was reviewed and estimates of the salt recovery efficiency were made. The net salt mass remaining and the ongoing rate of loss were estimated.



The effectiveness of the abstraction to hydraulically contain and recovery the salinity was examined through numerical modelling. It was concluded that the plume has not been contained, 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 to minimise/ prevent salt losses
- -Risk assessment
- -Eventual cessation of pumping

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