

GEOSCIENCE, WATER AND SALINITY IN WA RURAL TOWNS

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Western Australia has serious salinity problems both in the agricultural lands of the WA Wheatbelt and also in the Rural Towns which serve the Wheatbelt. A major multi-disciplinary, multi-agency project: Rural Towns – Liquid Assets began in mid 2005 to address salinity and water issues in sixteen of the most salt affected towns. Salinity affects the infrastructure (roads, railways, buildings) and also affects the water supply. The project is designed to mitigate the effects of salinity, find more water for these towns and more uses for the water to encourage new industries. The project includes social surveys of what the individual communities want, geology, geophysics, hydrogeology, engineering design work, and construction of water management plans. The management plans also contain an economic evaluation of the various options included within the plans.

This paper provides an overview of the Rural Towns Liquid Assets project and includes examples of the integrated work from various towns within the project.

The Water Management plans, delivered to each participating Shire, have four main components aimed at water abstraction and re-use (Pridham et al, 2004):

- Groundwater control strategies to alleviate the impacts of salinity and water logging on natural and built assets.
- Analysis of groundwater treatment and disposal options.
- *Evaluation of water use options, including economic analysis of water use / reuse.*
- *Social benefits derived from increased water availability*

Remediation strategies include groundwater pumps, improved surface drainage, trees and desalination.

Geophysics is being used to provide information on the geology of regolith and bedrock. And also to assist the construction of hydrogeological models. Working in town environments is challenging in terms of electrical interference, vehicles and people. However practical cost-effective ways of using geophysics have been worked out. Gravity surveys has been widely used in this project and have proved very useful for determining depth to bedrock and siting new boreholes for groundwater pumps. This is supplemented by other geophysical methods such as time domain electromagnetics, seismic and borehole geophysics.

This project has achieved various outcomes including:

- Building successful integrated multi-disciplinary team across agencies
- Finding more sources of water in project towns
- Identifying suitable sites for groundwater pumping
- Delivering Water Management Plans
- Integrating regolith geoscience with hydrogeology
- Creating opportunities for student involvement

REFERENCES

- PRIDHAM, M., BARRON, O., PLUSKE, J., 2004. Rural Towns – Liquid Assets. Turning a threat into a resource. Conference proceedings, 1st National Salinity Engineering Conference, Perth, November 2004, p302-307