



Australian Government
Department of the Environment

RESEARCH TO INFORM THE ASSESSMENT OF ECOHYDROLOGICAL RESPONSES TO COAL SEAM GAS EXTRACTION AND COAL MINING

The Office of Water Science has commissioned a multidisciplinary consortium, led by Griffith University and including the University of New South Wales, Edith Cowan University, Subterranean Ecology Pty Ltd and Yorlb Pty Ltd, to carry out a research program in 2015-2016 focused on ecology research to address critical priorities concerning ecohydrological responses to coal seam gas extraction and coal mining.

This project involves an integrated programme of research that addresses key elements within each of four major components:

Component 1 – Ecohydrology of groundwater dependent terrestrial vegetation

This component aims to understand the spatial and temporal variability of the importance of groundwater as a plant water source in the catchments of perennial and intermittent streams. It will also develop a typology of vegetation-groundwater interactions (hydrotypes) to support investigation of responses to altered availability of groundwater as a result of CSG and coal mining developments.

Component 2 – Ecological values of baseflow and surface water-groundwater connectivity regimes in non-perennial streams

This component aims to quantify and describe the functional role of baseflows in sustaining non-perennial stream ecosystems. In particular this component will look at how changes in flow permanency influence primary production and organic matter processing as well as community and food web structure during periods of flow.

Component 3 – Hydrogeochemistry, biogeochemical processes and the hyporheos / stygofauna

This component aims to understand how changes in hyporheic exchange and biogeochemical conditions affect the ecological conditions for hyporheos and stygofauna. More specifically this component will look at how changes in hydrology, especially groundwater drawdown, affect organic carbon cycling, nutrient cycling, redox biogeochemical and microbial processes, and hyporheos/stygofauna.

Component 4 – Composition and resilience of Great Artesian Basin spring communities

This component aims to conceptualise and quantify associations between the hydrogeochemical characteristics and hydrologic connectivity of GAB spring wetlands and their ecological community composition. The resilience of spring communities to hydrological change (including water drawdown and change in water quality) will be explored.

The first three components will be carried out at two field sites: i) the established NCRIS (National Collaborative Research Infrastructure Strategy) Groundwater Infrastructure field site in an upper tributary of Maules Creek (NSW) and ii) the Bremer River (Qld) catchment.



Stygofauna image © Subterranean Ecology 2015

The research components were scoped at a workshop in July 2014 attended by university researchers and state agency staff. Researchers from the consortium will have continuing contact with state government scientists during the course of the research to ensure that their work complements state government projects and that the outputs are targeted to best meet the needs of potential users. The research is scheduled to be completed in December 2016.

For more information contact the Project Manager, Dr Nick Marsh: nick.marsh@yorb.com.au