



**Project: OPHIR ROAD WASTE MANAGEMENT FACILITY  
Hydrogeological Assessment and Investigation**

**Location: Orange, Central-Western NSW  
Client: Orange City Council**

## **Highlights**

- Full hydrogeological characterisation supported by drilling investigations
- Characterisation of contaminants present in underlying groundwater
- Recommendations for containment and monitoring.

## **Background**

Orange City Council managed a waste management facility at Orange as an ongoing landfill operation, and sought to extend its area to the south. Terrasciences Ltd engaged C. M. Jewell & Associates Pty Ltd to undertake profiling of the geology, and to assess depth to groundwater, hydraulic gradient, distribution of hydraulic conductivity and groundwater chemistry.

## **Hydrogeological Environment**

The landfill area is underlain by volcanogenic basement rocks of Ordovician age, comprising tuffs, shales, chert, breccia and dolerite. The basement's fabric is steeply dipping north-west trending foliation pattern. Zones of fractures and deformation, with distinct joint sets, are observed in exposures. Overlying the basement is a residuum/colluvium or regolith, up to 8 metres thick. Variable depths of saturation are observed in the voids and fractures within the basement rocks. The water table follows the topographic profile, albeit in a subdued manner.

## **Objectives and Scope**

An initial desktop assessment utilised data from the Department of Land and Water Conservation, and a subsequent drilling program placed six boreholes on the margins of the active landfill. Each borehole was characterised as follows:

- geological logging of chips and core
- geophysical downhole logging
- installation of a piezometer and correction of water level to common datum
- permeability testing (rising head)
- groundwater sampling for characterisation of water quality

Analysis of the resulting data provided information about the landfill's impact on surrounding groundwater.