



**Project: PEAK HILL REGION
Hydrogeological Investigation**

**Location: Bogan River, north-western NSW
Client: Peak Hill Gold Mines**

Highlights

- Integrated geological and geophysical regional evaluation of groundwater potential
- Test well drilling, geophysical logging and construction
- Test pumping and determination of safe yield.

Background

The need to identify alternative water supply sources for the Peak Hill gold mine led to a series of staged geological and hydrogeological studies.

C. M. Jewell & Associates Pty Ltd was commissioned to identify and prove the availability of sustainable groundwater supply for the mine. The studies covered three prospective zones selected on the basis of desktop evaluation, geological inference and regional-scale geophysical surveys. Initial scoping studies of each site indicated that the fractured sandstones of the Herveys Range offered the best prospects of providing the required water supply.

Hydrogeological Environment

The Herveys Range is composed of Palaeozoic metasediments and intermediate volcanic rocks. These are both folded into a synclinal feature, and faulted and fractured under tectonic stresses. Groundwater yield is related to the density and intersection of faults and joints, and is primarily determined by fracture sets.

Scope

Following selection of the Herveys Range site – a process that included evaluation of existing geological maps, an aeromagnetic survey of the district, and mapping of inferred fracture lineament – drilling site locations were chosen. Five boreholes were drilled to depths of between 79 and 115 metres. Three boreholes were developed as wells, and pump-tested so that long-term yield could be assessed. Analysis of test results led to the adoption of an optimal, cyclical pumping schedule for long-term production.