

**GEOHART is a geotechnical company which provides an efficient geotechnical and geomechanical consulting service through investigations and innovative solutions based on extensive experience in mining and civil projects specialising in the following areas:**

- Ground Control Management Plans (GCMP) / Strata Instability Principal Management Plans
- Ground instability investigation
- Open cut mine slope stability assessments (e.g. high / low walls and waste dumps)
- Tailings and water dam facility (embankment) assessments
- Underground mining rock mechanics reviews
- Shaft assessments / review
- 2D & 3D numerical stress modelling and geotechnical block modelling

GEOHART CONSULTANTS have the capability to develop Ground Control or Principal Hazard Management Plans for both open cut and underground mines. In particular, Geohart Consultants have been involved in the drafting of a number of Ground Control / Principal Hazard Management Plans (GCMP) and ground instability investigations.

Ground support standards are usually developed as a separate document based on the design methodology contained within the management plan.

Each Management Plan is tailored to suit the requirements of the particular mine, however in general, the following process is followed:



**Specific examples of Ground Control / Strata Instability Management Plans Geohart's Consultants involvement include:**

- Ernest Henry Mine – Open Pit & Underground GCMP's
- Hazelwood Open-cut Coal Mine GCMP
- Strait Resources, Tritton Underground Copper Mine GCMP
- Newmont – Tanami void Management Plan
- Xuandong Strata Control Management Plan
- Copperchem, Great Australia Operation GCMP
- CBH Resources, Endeavour Underground Pb/Zn Mine GCMP
- Newmont, Pajingo Operations GCMP
- Apex, Wiluna GCMP
- Barmingo Contractors - Code of Practice for Underground Shotcrete Application
- Xstrata Copper, Mt. Isa Operations - 3rd Annual Review of Ground Control Management Plan - Shotcrete specification assessment
- Loy Yang Open Cut Mine - Overburden dump operational manual and procedure review
- Yallourn Open Cut Mine - Overburden dredge mining operation
- Vaal Reefs Exploration - Code of Practice for No. 2-shaft stoping panels – alternative ground support regime
- Impala Platinum Mines - Code of Practice on combating rockfall and rockbursts
- Pajingo Operations - Standards and procedures pertaining to safety and ground control
- Pajingo Operations Training manuals for underground operators and ground hazard awareness programs

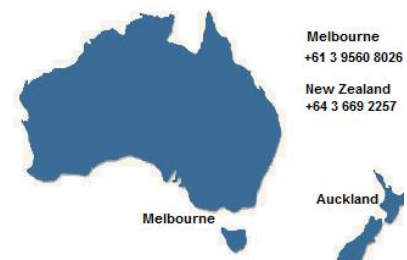
A critical component of all Ground Control is to investigate any unplanned falls of ground / failures. The conclusions from the investigation as well as all other ongoing monitoring form a closed loop when they are incorporated into the site specific data collection process.

Geohart have extensive experience in Fall of

Ground investigations to determine the failure mechanisms, possible causes and remedial actions to be undertaken.

**Specific Involvement in Fall-of-Ground (FOG) Investigations:**

- WorkSafe SA / SA Crown Solicitor - Independent expert witness in BHPB ODO mine fall of ground fatality investigation SA – Prepared an expert witness report for the SA Crown Solicitor
- NSW Crown Solicitor - Independent expert witness in Beltana coal mine fall of roof investigation NSW
- Straits Resources, Tritton Copper Mine - Fall of ground review and Ground Support Standards Review
- Apex, Wiluna Gold Mine - Seismic event fall of ground investigation
- FMR Investments, Eloise Copper Mine - Rockburst site investigation
- Charters Towers Gold, Sons of Freedom - Fall of ground investigation
- Beaconsfield Gold (Tasmania) - Investigation following fall of ground fatal incident for risk assessment
- Collingwood Mine – Geotechnical Review of Airleg Mining – QLD DME Stoppage Directive
- CBH Resources, Endeavour Underground Mine - Fall of ground investigation following failure of stope shoulder
- Pajingo Gold Mine – Newmont - Numerous UG Falls Of Ground (incl. Fatalities)
- Impala Platinum - Numerous UG Falls Of Ground (incl. Fatalities)
- Vaal Reefs Gold Mine – Anglo Gold Ashanti – Numerous UG Falls Of Ground (incl. Fatalities)



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