

# QUARRY TROUBLESHOOTING

**GWP Consultants LLP (GWP) has considerable expertise in troubleshooting quarry problems. The problems that arise in working quarries take many forms:**

- Small and large scale slope instability;
- Diggability;
- Inadequate haul roads;
- Insufficient tipping space;
- Surface or groundwater pollution;
- Excessive blast vibration.

Solving these problems requires expertise in a number of different fields, notably quarry design, geotechnics, equipment selection, blasting, hydrogeology and hydrology. GWP staff have the requisite range of expertise with which to tackle all these problems and find the most cost effective solution.

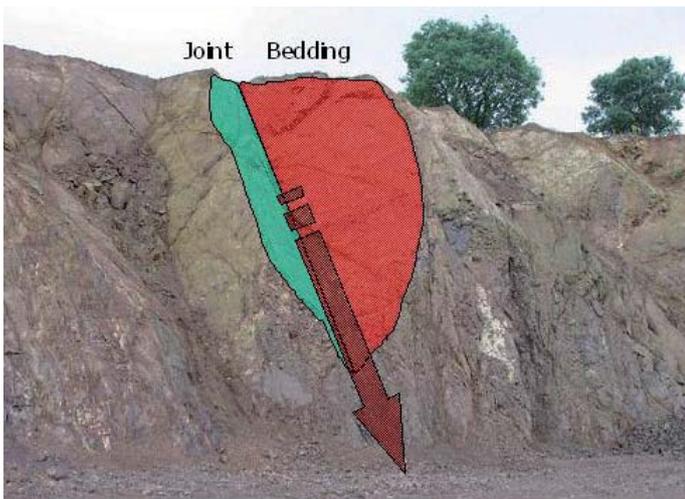
## Some recent projects

### Stability

Many GWP troubleshooting projects have been related to stability of quarry slopes. Recent projects have included a large quarry in Somerset where major face failures were giving rise to serious safety concerns. GWP advised on methods of working and face alignments to minimise the risk.

Other sites where GWP has recently undertaken troubleshooting on stability matters include a Gloucestershire landfill site and several large quarries.

GWP was also called in to advise on causes and remedial measures for a large landslide adjacent to a gypsum quarry in Romania.



Major wedge failures



Large landslide causing silos to tilt

### Diggability

A slate mine in Ireland had problems with the cutting of slate due to thin hard sandstone bands. GWP advised as to the best method of excavating the slate using the existing equipment.

Other diggability problems addressed by GWP have included advice on blast design to optimise fragmentation.

## Selective experience

### Haul road design:

Selecting the correct haul road gradient, width and curvature is an important matter in the economics and safety of quarry operations.

GWP has advised a number of operators on optimum haul road layouts and how these may be fitted into the quarry. The haul road width and gradient also impacts on the available reserves



Haul road too steep and narrow

### Water pollution:

Increasingly strict environmental standards mean that many quarries find it difficult to comply with discharge consent requirements. Failure to comply can lead to heavy fines from environmental protection agencies.

GWP has designed and supervised the construction of numerous low maintenance lagoon systems that discharge water of the requisite standard for major international construction materials producers and smaller independent operators.



Dirty water from inadequate pond

### Blast vibration:

GWP has recently teamed up with Leeds University to form a new company, Blast Log Limited. Central to the work of Blast Log Limited is the application of, a blast vibration compliance monitoring package, BLAST LOG®. This is a comprehensive service offered to operators principally to enhance blast performance and provide compliance monitoring factual reports to meet planning regulations.

BLAST LOG uses a database holding blast design information and blast vibration monitoring results from quarries and opencast coal sites throughout the UK. This is a unique consultancy and compliance tool offering a very fast turnaround of data and near instant solutions to real problems.

It has been demonstrated that blasting performance can be improved and problems reconciled through BLAST LOG by analysis of a site's historical and current blasting data



New road under construction at flatter gradient



Clean water from properly designed pond



Results of poor blasting technique

## Key contacts

For details and to discuss your requirements, please contact one of the following:

**Dr. Alan Cobb**, Joint Senior Partner and Chief Geotechnical Engineer. Responsible for designing tips, lagoons and excavated slopes and structures. Involved in blasting studies and materials handling. E-mail: [AlanC@gwp.uk.com](mailto:AlanC@gwp.uk.com)

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