GEOLOGY

Geological investigation is a core skill area that forms the foundation for much of the work carried out by GWP Consultants LLP (GWP). Geological studies range from large-scale geological assessment for the exploration of mineral deposits to small-scale works designed to resolve specific problems.

Desk studies are carried out to provide a comprehensive understanding of an area's geological, geotechnical and hydrogeological regimes. These studies may include reviews of published literature and historical maps, previous site investigation work, remotely sensed data and land use searches. This information is used to design effective site investigation programmes, to prepare data packages for marketing reviews and for the selection of mineral exploration areas.

Deposit evaluation studies require a detailed understanding of the geology of both the mineral and waste components of a deposit. GWP has wide-ranging experience in this area having carried out resource and reserve evaluations for cement raw materials, bulk minerals, coal, iron ore, and base and precious metal deposits. GWP uses LSS software for volumetric calculations and Datamine for block modelling and the evaluation and visualisation of complex deposits.

Site Investigation: Rotary drilling

Geological and geotechnical mapping

Site investigations are conducted to acquire data for mineral exploration, resource evaluation and construction projects. GWP has extensive experience in the design, implementation and supervision of site investigation programmes, including geological and geotechnical mapping, borehole drilling, trial excavations, geological and geotechnical logging, *in situ* testing and sampling, geotechnical and hydrogeological installations, and geochemical and geophysical surveys.

Quarry Design is central to GWP's activities. A thorough understanding of the geological regime is the essential foundation for a robust quarry design. GWP excels in the design of large quarries and opencast mines to the highest standards. Our clients are offered a complete service in relation to quarry design, including site evaluation, product appraisal, conceptual and detailed designs, scheduling and phasing of operations, and restoration design.

Selected projects

Evaluation design and Support

- Re-evaluation of all of the UK mineral resources for a cement operator.
- Design of two major quarry extensions as part of successful planning applications to secure 40 to 50 years of operation for established and expanded cement works.
- Providing operational support in relation to the safe disposal of cement kiln dust (including planning, licensing, environmental and health and safety risk assessments, supervision of the works and construction quality assurance), optimum working layouts, hydrogeological impacts of quarrying, and detailed surveying and reserve audits.
- Raw materials related inputs to feasibility studies for a major cement works expansion project in Ethiopia.

This work required:

- Review of locally produced regional exploration mapping & site selection for limestone, clay, sandstone and gypsum quarries.
- Analysis and modelling of geological and geochemical data from the drilling programmes.
- Estimation and reporting of raw material reserves to international standards.
- Specification of drilling requirements at each deposit and advice on standards for logging, sampling and laboratory sample preparation.
- Design of the mineral operations including detailed design of quarry layouts, accommodation of overburden/ waste rock, specification of working methods, health and safety, and equipment selection.

Design and management of a drilling and sampling programme at a greenfield site with potential for establishment of a new cement works in India. GWP undertook all geological and geochemical modelling, prepared reserve estimation reports and conceptual working layouts, and assisted the client to present the project to established cement makers.

Geological Support to Due Diligence Studies for international cement and aggregate clients, including verification of the reserve base, assessment of mining methods, mining economics and key environmental issues.

Site Investigation and Desk Studies at numerous sand and gravel and hard rock sites within the UK and Ireland including design and implementation of drilling investigations geological modelling and reporting.

Estimation of reserves and statistical analysis of coal quality in an independent assessment leading to feasibility decisions at an open cast coal site in Scotland. The work included geological and geotechnical logging of coal measures (specifically to identify coal seams and the presence of intraformational shear zones), evaluation of coal seam stratigraphy and the distribution of heat affected coals.

Key contacts

For details and to discuss your requirements, please contact:

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