



Sampling and Quality Management for Geologists

2 Day Professional Development Course

Course Leader: Mike Stewart

Objectives of the Course

This two day course gives participants a thorough understanding of the importance of sampling to the mining value chain. The course attempts to present a holistic view of the management of sampling quality. The financial impact of poor sampling is considered and discussed followed by an introduction to the science of sampling: Gy's Theory of Sampling. The importance of the 'forgotten' part of Gy's Theory – the notion of correct sampling – is emphasised, along with highlighting the role that Quality Assurance plays in ensuring that sampling is indeed performed correctly. The better known half of Gy's theory (Gy's formula) is introduced and explained in easily accessible terms. Good and bad sampling practices in a wide range of applications are discussed with a focus on exploration, resource definition and grade control drilling and sampling techniques.

Managing sampling quality requires that we first define what level of quality we require from our samples. The purpose and limitations of Quality Control sampling are introduced. Specific tools for analysing and interrogating QC data are presented, along with practical examples of 'in-control' and 'out-of-control' sampling and analytical systems. Participants are led through how to integrate these aspects into a sampling quality management system. Critical questions such as "when is a result unacceptable" and "how should I react to a quality problem" are addressed. Participants are encouraged to discuss and assess the relevance of alternative quality management techniques to their situations. Time is devoted to questions, impromptu lectures and discussions.

Who Should Attend?

This professional development program is designed for professionals working in exploration or mining geology including grade control. It is particularly aimed at people with responsibility for designing and implementing geological sampling programs and is strongly focused on giving users a set of practical tools to ensure that sampling programs meet a specified quality level. Participants are introduced to the key concepts of the underlying Theory of Sampling. Non-geologists involved in resource-reserve evaluation or mine-mill reconciliation will also benefit from the program as they will be introduced to concepts such as precision and accuracy and the impact of sampling on resource risk.

Program

Day 1	<p>Introduction to Sampling</p> <p>Sampling in a business context;</p> <p>The financial impact of bad sampling;</p> <p>Sampling statistics;</p> <p>Drill sampling - breaking, delivery and collection;</p> <p>Gy's Theory of Sampling:</p> <p>Correct sampling;</p> <p>Gy's formula;</p> <p>Defining sampling errors;</p> <p>Errors or mistakes? – predictable vs. unpredictable errors;</p> <p>Implications for design and operation of sampling devices;</p> <p>Sample preparation;</p> <p>Brief overview of analytical methods.</p>
Day 2	<p>Sampling and Quality Management</p> <p>Quality Assurance (QA) - procedures and protocols;</p> <p>Quality Control (QC) – understanding the purpose and limitations of QC;</p> <p>Analysing and interpreting sampling QC results (standards, duplicates and blanks etc);</p> <p>Reacting to 'out of spec' QC data - taking appropriate actions;</p> <p>The importance of avoiding mistakes;</p> <p>Isolating the error attributable to individual sampling stages;</p> <p>Predicting the effect that changes to sampling protocols will have on quality.</p>

A full set of PowerPoint slides will be provided to each participant. Additional reference materials including examples and test cases will be provided electronically at the completion of the program.



Course Leader: Mike Stewart

Mike Stewart is a geologist and geostatistician with over 18 years experience of nickel, gold and copper projects, for a variety of deposit types. He has run a number of courses in geostatistics and sampling in Australia and Africa. Mike has particular strengths in mining geology and the application of geostatistics to mining operations. He has been consulting in all aspects of resource estimation and applied mining geostatistics since 2004, particularly focusing on skill transfer (“co-pilot training”) with mine geology and resource teams.

Mike is Principal Consultant with QG and holds both B.Sc and M.Sc (first class honours) degrees in geology from the University of Canterbury, NZ. In addition he holds the CFSG post-graduate Diploma in Geostatistics from the Paris School of Mines (Fontainebleau). He is a member of the AIG and the AusIMM.

Further enquiries: info@qgroup.net.au and see also www.qgroup.net.au