Sample Preparation Quality Control

Providing exceptional quality is a cornerstone of the ALS Geochemistry business. To achieve this, the ALS quality control program is an integral part of day-to-day activities that involves all levels of staff.

Checks and balances are included at each critical step of the sample preparation process with real-time feedback to operators, monitoring through all management levels, and reporting via independent QC groups. By transparently providing this information, clients can be assured that preparation requirements are met.

Sample preparation quality control

The first stage for samples arriving at ALS is sample preparation, and quality at this initial processing point is particularly important to ensure best results from the analytical procedures that follow. Quality control at ALS starts with sample entry-point barcode capture into the Laboratory Information Management System (LIMS) for chain of custody and to allow for tracking throughout the laboratory. This is followed by protocols to ensure sample order, comminution fineness requirements are met, and sample to sample carryover is prevented.

Sample preparation fineness

A key indicator of crushing and pulverising quality is sample fineness. At a frequency of at least 1/50 samples, crushing and pulverising processes are monitored by sieving the prepared material to ensure fineness specifications are met.

Typical preparation methods include the following specifications, however, many other fineness options are available and may be recommended in specialised cases where coarse particles (Au, Ag, Cu) may cause difficulty in obtaining a representative sample for analysis.

- Crush: >70% of the crushed sample passes through a 2mm screen.
- Pulverise: >85% of the pulverised sample passes through a 75-micron screen.

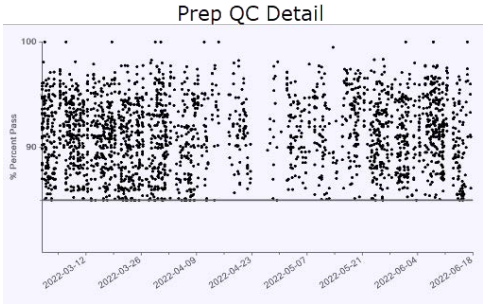

Figure 1: Sample preparation pulverising fineness data.

Real time measurement and evaluation of sample preparation QC data enables the identification of equipment, operators or processes that are not performing within specifications, and corrective actions such as adjusting equipment or timing can be made. Quality control charts are posted and reviewed on a routine basis.

Sample preparation cleanliness

To ensure no batch to batch carryover occurs, standard quality control procedures include passing barren wash material through crushing and pulverising equipment at the start of each new batch of samples.

Within a batch, equipment is cleaned thoroughly with compressed air to remove any remaining loose material.

Requests can be accommodated to include barren material washes between mineralised samples within a batch to reduce or eliminate carryover between samples. This is highly recommended for cases where extremely high-grade samples have been submitted for preparation.

Sample preparation duplicates

In addition to fineness tests, sample preparation quality is monitored through the insertion of sample preparation duplicates. For every 50 samples prepared, an additional split is taken from the coarse crushed material to create a pulverising duplicate. The additional split is processed and analysed in a similar manner to the other samples in the submission.

It should be noted that the precision of the preparation duplicate results is highly dependent on the individual sample mineralogy, analytes of interest and procedures selected for sample preparation. Therefore the data is most relevant at the client project level.

Independent quality control department

Commitment to quality control at ALS is provided by an independent quality control group. This group reports outside of Operations Management with a mandate to assure quality for clients and to monitor, track and resolve quality issues.

This group regularly reports on quality control metrics to ALS Management and in addition to the routine QC tests, independently verifies samples that have been prepared at branch preparation locations.

Geochemistry facilities are also audited on a regular basis to assure consistent quality across the network of ALS facilities.

At ALS, we believe that data quality is the foremost requirement of our business and as such, prioritise all quality activities.

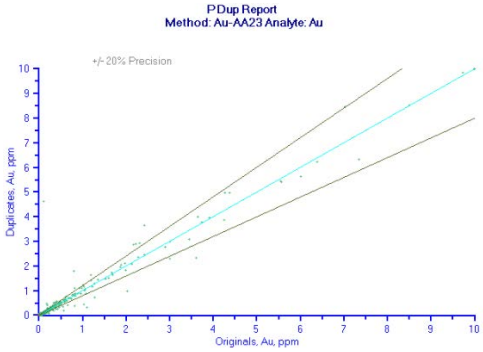

Figure 2: Sample preparation duplicate Au data

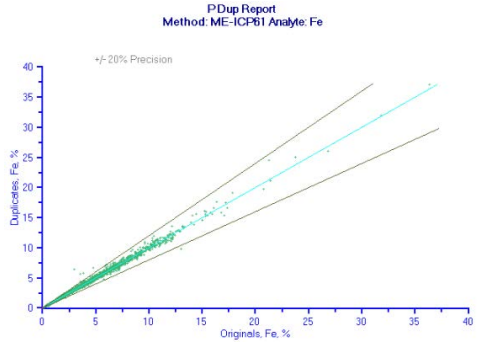

Figure 3: Sample preparation duplicate Fe data

Quality control data availability

All sample preparation quality control data is automatically captured and retained in the ALS QC Database, and is available on Webtrieve™ for client review. The data can also be provided with each sample batch's Certificate of Analysis.

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