Analytical Techniques – North Australian Laboratories

Sample Preparation:

1. Jaw Crusher

Procedure
This device crushes the sample to a nominal 10mm by the repeated compression of two steel plates. When used it is let to run continuously and is cleaned with compressed air in-between each sample.

Comments/Problems
This method of cleaning appears to be sufficient in eliminating contamination as the jaw crusher's workings are fairly simple.

2. Roller Crusher

Procedure
Samples are then inserted into the roller crusher. It consists of two closely spaced rollers through which the sample is fed through and crushed. The sample is crushed to a nominal 2-3 mm, however tabular chips have been seen as long as 20mm. The machine is let to run continuously and is cleaned in-between each sample using compressed air.

Comments/Problems
Though apparently free of loose particulate matter, a very thin but suspicious crust lines the rollers which may possibly affect sample purity.

3. Splitter

Procedure
Crushed sample is then fed into a splitter that splits the sample 50:50. 1kg of sample is then retained for testing while the rest is bagged and returned to the client as coarse rejects.

4. Drying

Procedure
The sample is then bagged and dried in a kiln at 80 to 130 deg. Celsius.

5. Keegor Mill

Procedure
This is the final stage of the grinding/crushing process. The process is similar to the grinding of flour in a stone flour mill.
The 1kg sample is fed into the hub of two oppositely rotating mild-steel plates (somewhat reminiscent of the stone wheels found in a flour grinding mill) and the resultant crushed material is expelled from their rim and collected via a schute and into a pulp reject bag. The controlling factor of discharge is size, so no sample leaves until crushed down to 100 microns. This may mean long grinding times for very hard rock samples.

Of the original 1Kg of material inserted into the Keegor mill, 400g is retained for testing and the rest is discarded. The Keegor mill then is flushed with stream sediments after each sample. An assay of the stream sediments is taken for each load received, and is generally below 10 ppb Au.

Analytical Methods

All the drill and rock chip samples analysed by portable Olympus X-Delta XRF and those deemed necessary or interesting were sent to North Australian Laboratories assaying for Cu, Pb, Zn, W, Au, Ag, W, Sn, and U. Gold (Au) was analysed by Fire Assay using 50 gm charge. Ag Cu, , Pb, Zn, Bi As , Fe and Mn were assayed by ICP-OES and W, Sn, U by ICP-MS.