



MUSSELWHITE AUTOMATED SAMPLE PREPARATION SYSTEMS

The Musselwhite mine is situated in north-west Ontario, Canada, and is an underground gold mine in the Placer Dome group. The original sample preparation equipment followed a normal procedure i.e. crush in a jaw crusher, re-crush in a rolls crusher for a fine crush, riffle split out about 300 grams and pulverise in a ring and puck mill.

The drawbacks with this procedure were dust loss leading to possible biasing and health problems, insufficient sample weight being pulverised to provide a representative sample and possible strain injuries.

The new equipment was designed to fit into the existing room that had a **ceiling height of only 8 feet** and was small in area. The procedure was improved to pulverise a larger sample weight, splitting by RSDs, not riffle, and the manual work minimised.





- The first of a kind ROCKLABS Automated System with an electronic balance connected to the PLC
- It has a user-friendly interface and a clear control panel display for ease of use
- Safety Switches are also implemented into the system for emergency purposes

Two parallel Automated Systems are required to process the throughput of up to 900 samples per 24 hour day.

The two Automated Systems are similar but System 1 has an extra large crusher, the Big Boyd, at the beginning, to handle samples with lumps up to 150 mm. After this preliminary crush, the process is identical in both Automated Systems. The process is:

- 1) Crush the whole sample finely with a Boyd crusher and deliver the product with a belt conveyor to a Rotating Sample Divider (RSD)
- 2) Split out 3 kg of the crushed sample, from any sample weight going in, and feed this to a single stage CRM for a fast, coarse pulverise
- 3) Split the 3 kg in a second RSD, to present a set amount, e.g 500 grams, for re-pulverising in a two stage CRM and retain the remainder in a plastic bag held in a plastic pail. The fine product is collected in a cup for transfer to a sample bag and the CRM is cleaned with air flowing through it

All samples are weighed at the beginning of the process and the weight is used to control the RSDs.

One sample is produced every three minutes on each Automated System. One Operator can operate the two Systems. There is no inwards or outwards stacking of samples.