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ORE CONTROL AT THE INGERBELLE PIT

Separation of ore and waste at Similkameen Mining Company's Ingerbelle pit is being aided by the use of an x-ray fluoresence analyzer. This method was initially developed in order to reduce dilution along ore-waste boundaries but has now expanded to check all areas that has or could possibly have any mineralization.

The previous practice for ore control was to survey-in, after a blast, a line that is centered between blastholes drilled in ore and those drilled in waste. The line is marked by stakes and flagging to inform the shovel operator of his position with respect to ore. This method is satisfactory in orebodies where ore is uniformly distributed over relatively large areas and boundary dilution is therefore minimal. At Ingerbelle however, chalcopyrite occurs in very irregular vein networks with weak to moderate dissemination occurring locally. Between the vein networks the rock is barren. The cutoff between ore and waste is generally sharp and may be inches beyond an ore blasthole or the contact may be adjacent to a waste hole. If the ore-waste cut-off is surveyed "down the middle" between ore-waste holes as is usual the gain or loss of ore (or dilution) can become quite significant. With the XRF unit being used on a continuing assay basis the ore-waste boundaries are accurately located, thereby reducing dilution to a minimum. The boundaries are still marked as a general guide to blast hole indicated ore.

In practice the XRF unit is used as follows:

1. The shovel operator is notified by radio when the ore control

technician wants to sample the working face.

2. The shovel operator will then skim the face on either side and deposit two piles of rock on his right hand side near the base of the face. (Right side for safety.)

3. The O.C.T. then fills a bucket with fist-size samples, picked at random from each pile.

4. The samples are crushed to minus quarter inch using a portable jaw crusher.

5. The sample is then split down to two or three pounds and cuts are taken for analysis.

6. The sample is assayed on the XRF unit and the results recorded. The shovel operator is informed of results and will then signal the trucks of their destination be it crusher, stockpile or waste dump.

The process takes about 10 minutes to collect the samples, assay them, and notify the shovel operator of the destination. It takes approximately 3 minutes to load a 100 ton truck, therefore the control afforded is approximately an assay every 300 tons. (It takes less than 30 seconds for the shovel operator to collect two samples from the face.)

The Spectrographic x-ray fluoresence analyzer unit used at Ingerbelle is a Nuclear Chicago, 9200 series portable analyzer (a subsidiary of G.D. Searle & Co.). The analyzer consists of three units.

1. a scintillation detector 2. a source head assembly which contains a plutonium/ceasium radioisotope source and absorption filters and 3. a digital analyzer.

The digital analyzer consists of a linear pulse amplifier, a variable high voltage supply for the detector, a single channel pulse height analyzer, and a scaler w/selectable timer and neon decade display. Radiation is 30 millicurries.

In summary it can be said that the use of the XRF unit is eliminating waste in ore areas, accurately defining the ore boundaries, and allowing recovery of ore that was not indicated by the blast holes in waste areas. Before the XRF unit became operational at Ingerbelle the mill grade was consistantly less than the calculated grade and now, by using the XRF analyzer, the mill grade is consistantly higher than the calculated grade and ore tonnage has been increased.

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