
Concentrator Startup at Stillwater Mining Company's East Boulder Mine

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Stillwater Mining Company's East Boulder Mine (EBM) is located about 30 miles south of Big Timber, Montana at the end of Forest Service Road #205. Stillwater Mining Company has been constructing and developing the EBM since 1996. Low-grade development ore was stockpiled since mid-year 2000 in anticipation of concentrator start up in 2001. Prior to ore introduction, the concentrator was pre-commissioned in February 2001 with waste material. This allowed for ore handling, grinding, flotation, auxiliary systems, and most pumping and piping systems to be brought under load with slurry. Minimal problems were encountered during the pre-commissioning period, the concentrator was brought on line with low-grade ore in June 2001.

The major components of the EBM concentrator flowsheet are essentially the same as for the existing Stillwater Mine (SWM) concentrator located at Nye Montana. The EBM is about 13 miles to the West of the SWM and both concentrators process ore from the J-M Reef. The SWM concentrator has been operated and modified over the last 15 years. The basic design criteria and flowsheet for the EBM concentrator were derived from knowledge gained at the SWM. Some historical testwork was completed in the early 1980's on samples from exploration test mining and diamond drilling above the initial production areas for the EBM.

To confirm this work, and the basic design criteria developed from the SWM concentrator, a comprehensive metallurgical testing program was conducted in 2000 and 2001 on samples from the SWM and EBM. Test samples from the SWM were composites of crushed run-of-mine ore. Samples from the EBM were diamond drill core composites created from new intercepts centered on the preliminary development area. The EBM test results confirmed the validity of most key design criteria. However, overall recovery and concentrate quality were poorer for the EBM sample when compared to the SWM sample. The EBM results indicated problematic differences in mineralogy and base metal content, as compared with historical results at the SWM.

Since start-up the EBM concentrator has been operated at design throughput rates, but on a

campaign basis only. Ore is stockpiled until enough exists for a four-day operating period, typically from a Monday to Thursday, then the concentrator is shut down from Friday through Sunday. One or two campaigns per month were run in 2001. In 2002, a campaign has been run each week. This schedule has allowed a very systematic evaluation of performance, and conditions have been modified weekly as necessary. In this way, a wide variety of operating conditions have been tested in the plant. The patient evaluation of both physical and chemical variables has allowed optimization of plant performance. Key components of the optimization program have included: a finer primary grind; primary cyclone modeling; optimization of Unit Cell performance; evaluation of the mineralogy in various plant product streams; reduction of collector dosages; increase in rougher through scavenger agitator speeds; selection of cleaner circuit flow alternatives; alternative collector selection; and chemical treatment of process water. Current and future investigations include: cleaning of the Unit Cell concentrate; experimentation with regrinding alternatives; pilot testing of gravity concentration; and on-going investigation of higher agitator speeds in various flotation circuits.

References

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