



Process Optimization

Mineral Processing Plant Operations Optimization

Paterson & Cooke (P&C) is distinguished by a strong team with expertise in mineral processing operations. With decades of experience in evaluating current practices within mineral processing plants, we are at the forefront of a transformative shift toward operational excellence. Our collaboration with site and technical service teams aims to enhance process selection, production models, and operational strategies.

Our commitment is dedicated to elevating the efficiency of your mineral processing plant, enabling it to realize its full potential and establish new industry benchmarks for excellence. Whether the challenge lies in comminution or in the process plant, our approach fosters a seamless synergy of precision, engineering, and performance within your mineral processing operation.

The foundation of our approach involves a thorough site assessment of your ore, processing operations, and metallurgical accounting. We delve into every facet of your processing operation, identifying bottlenecks and opportunities for improvement from the initial crushing stages through to the final product. Every site brings unique opportunities for the implementation of cutting-edge metallurgical methodologies and innovative practices, all geared toward optimizing on-site metal extraction.

Yamana Gold – Jacobina, Bahia, Brazil Expansion Support, Plant Audit and Optimization

Yamana Gold had been considering the purchase of a third ball mill to achieve a desired 30% production increase in throughput at their Jacobina mine. The expansion project would have required the installation of several new pieces of equipment to accommodate the higher throughput (such as new leaching reactors, new screens, and new CIP tanks). P&C was asked to review the recommended modifications to the processing plant, to increase production from 6,000 tpd to 8,500 tpd.

P&C worked with the site team to review the plant operation data to help identify equipment capacity and other potential bottlenecks. The analysis revealed several low cost opportunities in the operation of both the crushing and grinding circuits that could increase throughput without needing to incorporate a third mill. Between stress testing and P&C's in house laboratory testing capabilities, the plant achieved the expansion throughput target more than twelve months before the initial target date. P&C was later contracted to complete site audits and lead the steering committee overseeing the overall expansion project.

Confidential Client Engineering Design and Flotation Recovery Improvement

The client was exploring process improvements at their fluor spar concentrator. The industrial mineral concentrator has historically suffered sub-optimal flotation performance at two parallel processing plants. The client enlisted

P&C to optimize the existing grind and flotation circuits and complete FEL1 engineering and costing studies of the re-configured process plants with the goal of producing acid grade fluorspar concentrate while reducing losses to the tailings and reducing overall fines content in the process water.

P&C performed a site audit, evaluating the current operating conditions and discussing options with the client. The resulting audit and engineering study optimized the grinding and flotation circuits by reducing overgrinding and associated grinding costs, increasing overall recovery, and minimizing product loss to tailings. The new process flow incorporated a coarsened grind by moving from primary and secondary grinding to a primary grind and concentrate re-grind configuration. Flotation tailings recycle streams were also reconfigured to improve gangue liberation and maintaining the concentrate grade while increasing recovery from 80% to over 92%.

Process Optimization Services

Engineering Services

- Geometallurgical determinations of optimized ore routing and processing
- Flowsheet development from Concept Studies through Detailed Engineering
- In-house laboratory metallurgical and tailings management testing
- Advanced, predictive production modelling

On site/Operational Services

- Commissioning support for new mineral processing equipment
- Process optimization (debottlenecking) and upgrade opportunities
- Site feed trials
- Operator training
- Process auditing, including focuses on Cyanide Code and Safety Compliance
- Qualified Persons (QP) for technical reports

Group Capabilities

- Tailings & Mine Waste
- Slurry Pipeline Systems
- Mine Backfill
- Mineral Processing
- Mine Services
- Marine Pipeline Systems
- Laboratory Services

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