

SIKA AT WORK GOLDEN ANTIOQUIA

BURITICA GOLD MINE, COLOMBIA



BUILDING TRUST

GOLDEN ANTIOQUIA

PROJECT DESCRIPTION

The Buritica Gold mine development project is located in the mountainous terrain of Antioquia, in the middle of the Colombian Cauca belt, in the countries Northwest. Gold occurences in the area have been known for a long time and artisinal mining activity took place within and around the Buritica project for centuries. The Canadian gold mining company, Continental Gold, started to explore and consolidate the Buritica deposit and early underground rehabilitation works were innitiated in 2012.

Sika Colombia is involved with this project since the very beginning, supplying a wide range of specialised, underground construction products to the mine site. The Buritica deposit is among the world's best in class gold mineralizations that have been discovered and developed in recent history. in 2020, Continental Gold was sold to Zijin Mining of China which will complete mine development and transition Buritica into comercial production. The deposit contains close to 12 million ounces of gold of very high grade, around 10g/t of ore. The two, epithermal, limestone hosted, stacked vein systems, called Veta sur and Yaruga, will be mined using slective cut and fill mining as well as bulk, long hole stoping with cemented paste backfill. Due to the rough topography at the site, several adits will allow underground access and ore will be gravity fed to the lower levels and treated at the leach plant down at te Higabra valley floor some 600 meters below the top portion of the deposit. Tailings will be deatered and transported to the paste plant above the deposit. Capex is estimated to be in the order of USD 512m. The life of mine is projected to be well over 14 years with a daily mill throughput of 3.000 tons

EFFICIENT MINE DEVELOPMENT

Sika Colombia is supplying the Buritica site from it's Medellin plant and supply hub. Sika Colombia is a true construction technology leader in Latin America and is spearheading



infrstructure development above-and underground. Backed by this strong expertise that reaches back for decades, Sika Colombia is today involved with most, large, civil infrastructureand mining projects in the country. The Sika Colombia mining team provides extensive technical support to the Buritica mining team and has assisted the transition from a small scale, selective mining approach to an efficient, rapid mine development scheme, including in cycle shotcrete application with concrete batched at different locations at the mine site. Long haulage distances along the ramp system to the point of use require a long slump retention of the concrete and fast setting after spraying allows for shortened re-entry times for the bolting crews and hence an overall faster installation of the primary support. Sulphide rich host rocks of the Buritica geology cause rapid degrading of steel structures underground including the installed screens. This was one reason the mine decided to go for macrosnythetic, fibre reinfforced shotcrete which resists corrosion and hence maintains the support capacity even over long exposure to ground water. Furthermore, they provide good yielding properties to the shotcrete under dynamic loads at low fibre dosage. Such loads are expected of a mine site of this magnitude with closely allocated underground workings.

SIKA SOLUTION

In order to fulfill the specified requirements for the Buriticaground support, Sika Colombia undertook extensive laboratory testing using the Sika Minishot® tool in the Sika Colombia laboratories where different shotcrete accelerator systems were screened for best cost performance based on the raw materials used at the Buritica mine site. The final shotcrete mix design that passed the qualification procedure includes Viscocrete®, SikaTard and Sigunit®. Especially during the early phase of the project, batching of the concrete for shotcrete application was done largely semi-manually close the the



Veta sur portal which required easy to handle components to batch a good quality concrete with limited concrete produciton infrastructure. Today, a modern, state of the art concrete batch plant is operating at the Higabra valley floor, providing shotcrete through the Higabra portal and tunnel in order to supply and secure the extensive underground development work at Buritica

REQUIREMENTS

- High energy absorption (yielding) under dynamic loads
- Steady shotcrete production also during times of intensive underground development
- Stable mix and low sensivity to raw materialsa
- A minimum dosage of accelerator
- Easy handling and dosage of fibres

SELECTION OF SIKA PRODUCTS

- Sika Viscocrete[®] High range water reducer (HRWR)
- SikaTard®-930 Consist
 - 0 Consistency stabilizer
 - Sigunit[®] L500 AF Alkali-free, high performance shotcrete accelerator
- SikaFiber[®] Force-60 Polypropylene Macrofiber
- Many other Sika construction products

1 Front: Underground development face at Yaruga

- 2 Semi-manual concrete batch plant close to the Veta Sur adit. A truck mixer is loaded with fibre reinforced conrete for wet applied shotcrete
- ${\bf 3}\,$ Looking down at the processing plant construction site at the Higabra Valley floor
- 4 Yaruga vein system and underground infrastructure (source: Continental Gold)
- 5 In cycle shotcrete applied at a development phase
- 6 Sika and the Buritica Mining team underground
- ${\bf 7}\,$ Buritica processing plant construction site with leach tanks and thickening units under construction







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