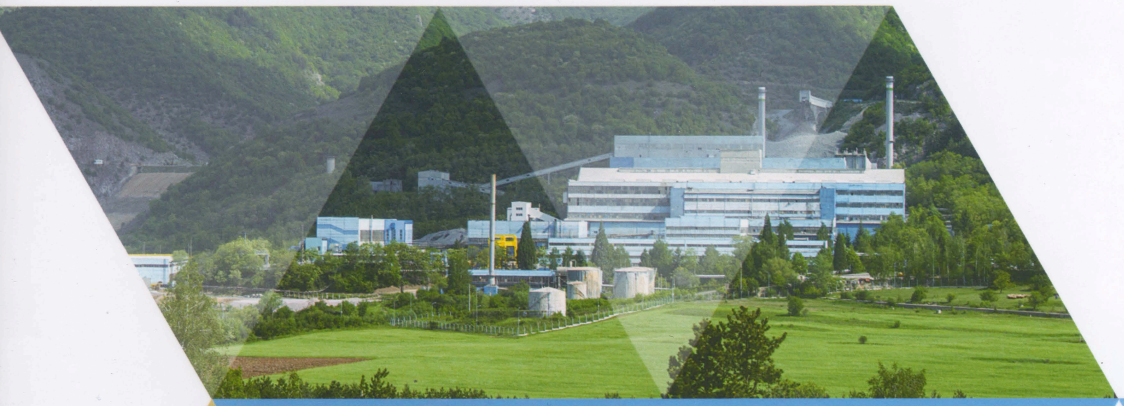
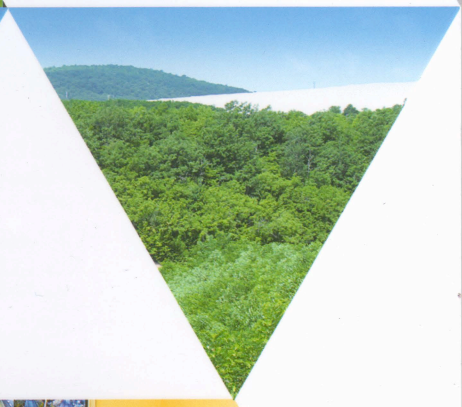
ellatzite med AD





THE ORE COURSE

Sustainable development - standard for true quality of life

MINE COMPLEX

The Mine Complex uses conventional open-pit mining methods including drilling, blasting, loading, hauling, and crushing.

Technologies

Ellatzite deposit is being operated as an open-pit mine. During its operation, an excavation and relocation of large quantities of rock material (overburden and ore) are carried out, as a result of which mining area is formed (open pit). The activities performed in Ellatzite mine include: drilling and blasting, loading and haulage, waste rock dumping, primary crushing and transportation of the extracted ore material to the Flotation Complex.

Drilling

The Mine Complex uses rotary and rotary-percussion with DTH hammer diesel-powered drill rigs produced by REEDRILL, TEREX, Cubex and Atlas Copco (Epiroc). The drilling rigs are used for performing exploration, production and pre-splitting operations. Some of the drilling machines are equipped with a ProVision® high-precision positioning system from Modular Mining Systems.

Blasting

Emulsion explosives are used. They are produced on site, under the licence of the US company AUSTIN POWDER. The initiation of the charges is performed by the non-electric Nonel®Unidet system as well as by an Austin Detonator electronic system.

Loading

The main excavating machines in Ellatzite mine are produced by TEREX and HITACHI (diesel and electric) hydraulic shovels with a bucket capacity from 8 to 15 m^3, equipped with ProVision® high-precision positioning system from Modular Mining Systems.

Haulage

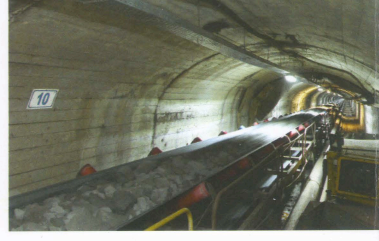
The coordination, management and control of mine haulage operations are performed using the Dispatch® system developed by Modular Mining Systems. The haulage is carried out with 130-tonne dump trucks Belaz 75131 and 100-tonne dump trucks Euclid-Hitachi EH 1700.

Primary Crushing

The ore is crushed into two crushing units: Primary Crushing Unit-1 (KET-1) with a two-stage crushing scheme and Primary Crushing Unit-3 (KET-3), built up inside the mine pit, with a one-stage crushing scheme. The operation of KET-3 has achieved significant reduction in haulage costs, machine fleet wear, maintenance costs and diesel fuel consumed. Furthermore, this investment has a great social impact in terms of environmental protection.

Transportation of crushed ore to the Flotation Complex in Mirkovo village

Crushed ore is transported by a rubber conveyor belt through an underground tunnel to Open Stockpile No.2 in the Flotation Complex in Mirkovo village. This unique facility – the rubber conveyor belt – has a single drive station and is one-of-a-kind in the Balkans.



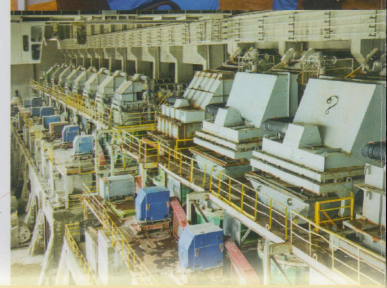
FLOTATION COMPLEX

Ore comminution, ore beneficiation, dewatering and stockpiling of flotation products are performed in the Flotation Complex.

Secondary and Fine Crushing

Secondary Crushing is performed in four crushing lines where the incoming ore is crushed to a size of 60-0 mm. In addition to crushing the ore mass by cone crushing aggregates, two pre-screening and control screening operations by linear vibrating screens are also included at this stage. The screened material is transported to an intermediate warehouse for the next process - grinding, while the residue is transported to the next crushing stage – Fine Crushing.

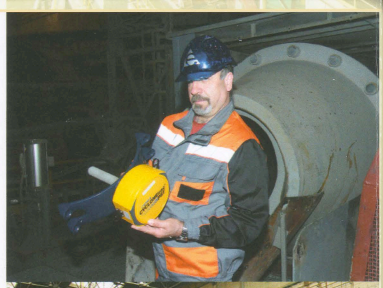
Fine Crushing is performed in nine crushing lines. After the crushing, a control screening of the crushed ore is carried out to ensure the fragmentation size required for the next process – grinding. The screened material is transported to an intermediate warehouse for the next process – grinding, while the residue is returned for reprocessing in the Fine Crushing stage.



Grinding and screening of the ore material

For the first time in Europe, Ellatzite-Med has received a customer appreciation award for the implementation of the innovative production system CiDRA Minerals Processing. This system allows the particle distribution size in the pulp to be monitored, thus increasing the productivity and the technological performance of the plant.

The ore grinding scheme consists of one-stage operation with classification. Grinding is carried out in 11 ball mill units. Classification is performed by centrifugal sand pumps and hydrocyclones operating in closed circuit. The technology of grinding requires the particle size distribution to be kept within certain predefined ranges. In order to increase productivity, the sands from the hydrocyclones of Mill No. 2 or Mill No. 3 are fed into another mill for re-grinding.



Ore flotation

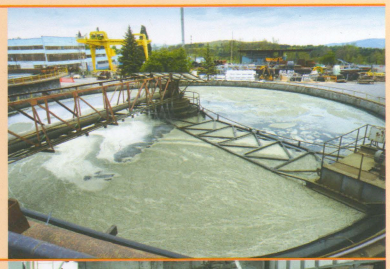
Ore flotation utilises an open cycle flowsheet, producing a collective final concentrate. The process of re-grinding the pulp is followed by three or four re-cleaning stages with additional control regrind at the first re-cleaning.

The main flotation flowsheet includes four stream lines equipped with pneumatic- mechanical cell type, Denver-500 cells, while the re-cleaning is completed with Denver-300 ones. The flotation reagents supply is multi-pointed aiming at intensifying the whole flotation.

THE ORE COURSE

Copper concentrate thickening

The thickening is carried out in peripheral drive thickeners. The technological concentrate containing a certain percentage of solid phase is thickened to a pre-defined density which is most suitable for the next stage of dewatering – namely filtration.

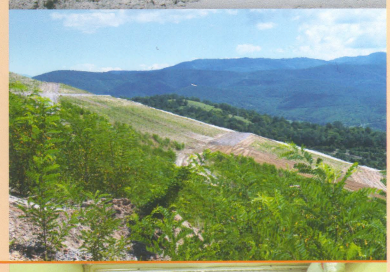


Copper concentrate filtration

The thickened product proceeds into a buffer sump where constant density is maintained. From there, by means of pumps, the thickened product is fed into a dispenser feeding a horizontal filter-press Metso or a vertical filter-press Larox. The filtration of the molybdenum concentrate is carried out by a horizontal filter-press. Automated dryer is used for limiting the moisture and oil content of the final molybdenum concentrate.

Storage of mineral processing wastes

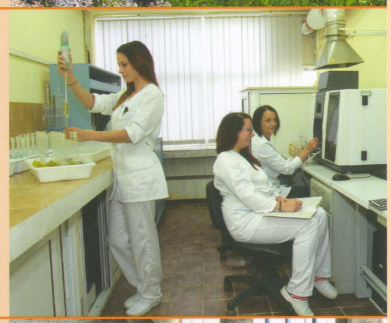
Benkovski-2 Tailings Pond has been operating since 1998 by using the natural landscape and building up the dam by coarse residue material. It is divided into two separate sections: Ay Dere and Suludzha Dere. The residue coming out of the Flotation Complex is gravitationally transported. The residue separation is carried out by hydrocyclones in Benkovski-2 Tailings Pond. The separated coarse particles are deposited downstream. The remaining fine particles are impounded upstream where they settle down (precipitate) in the decant lake. In 2018, at Benkovski-2, we introduced an innovative technology for dewatering and consolidation of tailings by a specialized MudMaster machine. As a result, the tailings density in the areas treated by the machine has rapidly increased. In addition, a long period of natural residue consolidation has been skipped. All this has made a positive impact on the stability and safe operation of the tailings pond as a facility.



Sampling and control

Continuous control over the products of the technological process is performed in the Flotation Complex. The metal content and particle size distribution of the ores, concentrates and tailings are controlled. The sampling in the flotation unit is automatic and the results of the express analyser are displayed on a dashboard, which continuously monitors the key performance indicators of the process.

Incoming control of the supplied materials, reagents and fuels is performed.



End product realization

The final product – copper concentrate – is traded on domestic and international markets.

ellatzite med AD

Ellatzite-Med AD is a leading company in the mining industry of Bulgaria, operating in open-pit mining and primary processing of porphyry copper gold-bearing ores from Ellatzite deposit. The company is part of GEOTECHMIN GROUP.

Ellatzite-Med conducts its activities on the territory of two mine sites – a Mine Complex and a Flotation Complex. The extracted ore is transported from the open-pit mine located near the town of Etropole to the Flotation Complex in Mirkovo village on a 6.5 km underground rubber conveyor belt under the ridge of Stara Planina Mountain.

Over the years, various programs have been elaborated for ensuring the company's long-term operation and for improving the financial and technical parameters of copper ore extraction and processing.

Today Ellatzite mine ranks among the top copper-producing companies with the largest production capacities in Europe. The company invests significant funds in new technologies and state-of-the-art equipment, as well as in continuous improvement of staff qualifications. By doing so, it strives to achieve sustainable development of the mine complex and continual improvement of working conditions and environmental performance.

The company is a member of prestigious trade associations such as the Bulgarian Chamber of Mining and Geology, the Scientific and Technical Union of Mining, Geology and Metallurgy, Srednogorie Industrial Cluster, the Confederation of Employers and Industrialists in Bulgaria. It is the founder and member of the Management Board of the Bulgarian Federation of Industrial Energy Consumers.

Ellatzite-Med contributes to the sustainable social and economic development of Etropole Municipality and the municipalities of Srednogorie Region where it operates.

ELLATZITE MINE

It is considered that Ellatzite porphyry copper deposit was formed during the Laramian metallogenic period (more than 65 million years ago). The deposit is composed of three major groups of rocks: Paleozoic metamorphic and intrusive rocks (phyllites, shists, hornfelses and granodiorites) and Late-Cretaceous intrusive rocks (quartz-monzodiorite porphyries and granodiorite porphyries). The mineralization type of the deposit is veinlet-disseminated. The main ore minerals are: chalcopyrite, pyrite, bornite, molybdenite. It is situated on the southern outskirts of the Western Balkan structural-metallogenic zone, in close proximity to Sredna Gora Mountain.

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