Explora project: new geochemical exploration tools in Neves-Corvo mine, Iberian Pyrite Belt

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The Iberian Pyrite Belt (IPB) is one of the world largest metallogenic provinces, it includes giant deposits as Neves-Corvo (NC) and Aljustrel in Portugal, and Rio Tinto, Tharsis and Aznalcollar in Spain [1]. The mining activity in NC, developed since 1987 by Somincor, is focused on Cu, Zn, Sn and Pb massive and stockwork ores of Neves, Corvo, Graça, Zambujal and Lombador orebodies. The works are all subterranean and extend until about 900m depth. To expand the reserves, the Somincor/Lundin Mining company has been developing a strong investment in exploration, which allowed the discovery of the Semblana (2010) and Monte Branco (2012) ore lenses. This success boosts expectations that reserves can increase once more.

The NC regional geology is characterized by the presence of large extensions of shale and greywacke outcrops of the Mértola Formation (upper Visean), presenting thicknesses over 700m in some NC areas. Most of the ore is hosted by the Volcano-Sedimentary Complex Strunian age rocks as black shales and rhyolites. The Phyllite-Quartzite Formation (Famennian) forms the base of the stratigraphic sequence.

The EXPLORA project aims to improve the geological, geochemical and geophysical models of the NC region to depths of about 1500m and promote the discovery of new sulphide mineralization favorable horizons, considering a conceptual near mining exploration scenarios. The preliminary results on the analysis of soils above the Lombador, Monte Branco and Semblana deeply buried orebodies will be presented. From these test sites, specific phases will be dissolved using different methods to detect geochemical anomalies. It is expected that the data gathered from these well-known geological sites can be used to discover new buried deposits.

[1] Inverno et al (2015) in 3D, 4D Predictive Modelling of Major Mineral Belts in Europe, SpringerVerlag, pp 191-208.