Bie-Bessoba Ore-Bearing Area (Polymetals)

Location

The Bie-Bessoba ore-bearing area is located in southern Kazakhstan, near Lake Balkhash. The railway station is located 30 km from the area. The Astana-Almaty highway runs along the border of the area, 4km to the east. There is also a power transmission line running along the highway.

Valuable Components

Within the ore field, several deposits and ore occurrences are distinguished.

The valuable components are copper, silver, lead, zinc, and tin.

Subsoil Use Contract

The current Subsoil Use Contract for Geological Prospecting is concluded for 6 years.
The signature bonus has been paid.
The work programme is executed in full within 2 years.
The area of the geological allotment is 1,374 km^2.

Intended Purpose of Investments

Searching for a potential joint venture partner to develop a project on the Bie-Bessoba ore-bearing area.

Overview of the Bie-Bessoba Area

Discovery of a large number of mineralisation objects and mineralisation points at the formerly closed Sary-Shagan military training ground, re-evaluation of materials from previous years and prospecting and evaluation work conducted by 2 Key LLP, allowed 9 potential ore-bearing zones to be identified: Maloshakshagayly (Sn, Pb, Zn, Bi, Cu, W, Mo), Ortazhartas (Cu), Balateniz (Cu), Ayakzhartas (Sn, Pb, Zn), Biye (Sn), Korgassandy (Sn, Pb, Zn, Bi, Cu), Uyssembay (TR, Pb, Bi, W), Karaungur (Fe), Shakshagayly (Fe).
At the same time, Ortazhartas and Balateniz areas are promising for the discovery of a large copper-porphyry structure.

The proximity of the deposit to the railway, Almaty-Astana highway, power transmission lines, flat terrain, and the presence of a large water body – Lake Balkhash – are very favourable for the mining development in that area.

The geographical and geological features of some parts of the Bie-Bessoba area are so diverse and attractive that they can serve as a place for geological tourism development.

Mineral Deposits and Occurrences

Rare-Metal Group

The **Bie Deposit**. The Bie area has a tin deposit with reserves of 15,000 tonnes of C1-C2, which have been confirmed by 3D modelling using modern tools. During test drilling, an increase in reserves of up to 25% is expected since the previous drilling was carried out using a chilled-shot method with all the ensuing consequences from selective abrasion to low core recovery. In the same area, works conducted in 2017 identified a zinc geochemical anomaly of up to 15% in individual samples. The size of the anomaly is estimated to be 200*200 metres and requires verification work.

The **Ayakzhartas Deposit** is located in the north-eastern exocontact of the Kaiba granite massif among conglomerates with interlayers of siltstones and sandstones of the Kashkanteniz Suite. The rocks have a northwest strike and dip to the southwest at an angle of 50-75°. A series of ridges of granites of the Kyzylray Sequence can be traced here. They are parallel to each other; their outcrops are 0.5-30 m wide and extend from 50 m to 4 km; tin-ore mineralisation is spatially related to them.

The 1.5 x 2.5 km ore-bearing zone contains a series of quartz-sulphide and quartz-carbonate veins of north-eastern (to near-latitudinal) strike. A total of 29 tin-bearing veins extending from 60 to 930 m with varying thickness and irregular ore mineralisation are distinguished in the area.

The **Karaungur Deposit** is a representative of the tin-polymetallic skarn deposits. Skarns were studied for the tin only from the surface in the western stripe of the ore field within 500 m between granite dikes.

Copper-Ore Targets

The **Ortazhartas Area** has indirect evidence of a large, buried copper-porphyry structure. Prerequisites for its detection:

- Presence of ancient mine workings
- Geochemical zoning
- Presence of secondary quartzites.

The **Balateniz Area** is promising for discovering a large copper-porphyry structure. Prerequisites for its discovery:

- Presence of ancient mine workings

- Geochemical zoning
- Extensive outcrops of copper mineralisation with copper content ranging from 0.8 to 19%, silver up to 56 g/t, and molybdenum. The composition of ore-forming components resembles the Kounrad deposit, located 150 km to the east.

Zhilnoye Copper Ore Occurrence: Lenses of rich disseminated Cu mineralisation of 10-40x1-3 m are confined to areas of intense epidotisation with rare garnet phenocrysts. Content of copper is 0.1-1.26%, lead is 0.1-0.3%, molybdenum is up to 0.038%, and silver is up to 5 g/t.

Nizhnessolonchakovoye Occurrence: two north-western quartz-carbonate veins are encountered, one has been uncovered by a large open pit, with rich pieces of malachite, chalcopyrite and bornite in the dumps. To the north, quartz-barite veins with galena are observed. Copper content is 0.3-2%, lead and zinc are up to 0.2%, gold is 0.1-0.3 g/t. Overall, the size of the copper-bearing area is 1.5x1 km.

Reserves and Resources

Summary table of reserves and resources:

	Cu, thou. t	Sn, thou. t	Zn, thou. t	Bi, thou. t	Pb, thou. t	W, thou. t	Mo, thou. t	Fluorite, t
$A+B+C_1$		0.13						
C_2		16.57	42.3		7.2			
P_1	175	44.84	72.7	2.65	12.8	0.39		5.25
P_2	25	62.6		14		9.4	8.5	
P_3	1,600	2.4						
Total:	**2,025**	**126.54**	**115**	**16.65**	**20**	**9.79**	**8.5**	**5.25**

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