



## CRM of Ukraine Database Supplements

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|-----------------|--------------------|
| Mineral target: | Perzhanske deposit |
| Commodity:      | Beryllium          |

**Version: 17 April 2024**

|                                  |                                                                                                                                |
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| <b>Project</b>                   | <b>101075609 — GSEU — HORIZON-CL5-2021-D3-02</b>                                                                               |
| <b>Supplement Data</b>           |                                                                                                                                |
| Supplement number:               | MO.400029                                                                                                                      |
| Dissemination level:             | Public                                                                                                                         |
| Supplement type:                 | Description                                                                                                                    |
| Work package:                    | WP2: Critical Raw Materials, the International Centre of Excellence and United Nations Framework Classification (CRM-ICE-UNFC) |
| Lead WP/ Supplement beneficiary: | [EGS]                                                                                                                          |

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| <b>Supplement status</b>         |                            |
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Location: The Perzhanske deposit of beryllium ores is located at a distance of about 2 km to the south and southeast of the Perga village, Olevskiy district, Zhytomyr region.

The degree of exploration: the deposit was discovered in 1960 during the geological surveying works of 1960-63. In the period of 1962-1977, phased comprehensive detailed geological exploration works were carried out, including laboratory and technological studies. Based on the results of the work, the USSR State Council of State Committee No. 7936 of October 25, 1977 approved, separately for open and underground mining, reserves of beryllium ores based on constant conditions, approved by the USSR State Council of State Council of Ukraine protocol No. 903-k of March 21, 1975. Repeated geological and economic assessment of reserves of the Perzhanskeberyllium ore deposit (Northern and Krushynka sites ) was carried out taking into account the reporting materials of all stages of geological exploration work in 1962-1977, as well as additional work in 2020-2021, carried out by Perzhansk Ore Company LLC in order to clarify the geological structure of ore bodies, qualitative and technological characteristics of beryllium-containing metasomatites. According to the results of the work, the reserves of beryllium ores and related minerals were approved by the decision of the State Committee of Ukraine (protocols dated 30.06.2022 No. 5485; dated 29.03.2023 No. 5565).

Area : 402.7 ha (of which: Northern section - 105.1 ha; Krushynka section - 297.6 ha).

Geological characteristics. Geostructurally, the deposit is located in the central part of the Perzhanske ore field and is represented by phenakite-genthelvin ores associated with alkaline rare-metal granites and feldspar metasomatites developed in the Perzhanskiy complex of Meso-Proterozoic granitoids.

The Perzhanske ore deposit is located in the gneisses block of the Perzhanski granites, between the Main and Southern faults of the northeast sublatitudinal strike, the Ubortskiy fault - the northeast submeridional fault, and the Plotnytskiy fault - the northwest strike. The Perzhanske ore deposit, together with the Yastrubetske, Yuryivske, and Sushchanske ore-bearing fields, form the Perzhanskiy ore district within the Sushchano- Perzhanska structural-metallogenic zone. The Perzhanske beryllium deposit consists of two ore-bearing structures: Krushynska and Northern ones.

The Krushynska structure consists of five ore zones with a northeast (azimuth 60-80°) strike with a dip to the northwest at angles of 40-70°. An ore zone is a series of contiguous ore bodies united by single contours of wallrock alteration. The length of the zones ranges from 420 to 3,000 m along the dip, from 60 to 400 m, and from 35 to 80 m by thickness. 5 ore zones have been identified within the Krushynska ore-bearing structure.

Three ore zones have been identified within the Northern structure, in a sickle-shaped plan with a length from 50 to 300 m along the extension and from 30 to 160 m along the dip with a thickness of 40-70 m. The dip of the bodies in the zones is centriclinal at an angle of about 50°.

Three types of ore bodies were identified: vein, lenticular and complex.

Beryllium mineralization is localized within ore bodies, which are represented by metasomatites of biotite-quartz-feldspar composition with genthelvin. Mineral composition of ores: feldspars – 69.4%, quartz – 21.2%, biotite – 4.1%, genthelvin – 4.1%, phenakite – 0.02%, fluorite – 0.17%, magnetite – 0.64%. The average content of beryllium oxide in ores is 0.54% (from the first hundredths to 8.12%), 98% of BeO is associated with genthelvin. The average zinc content in the entire deposit is 1.44%, including 1.49% in the underground mining area and 1.18% in the open-pit mining area. The chemical composition of beryllium ore flotation tailings meets the requirements of the glass industry.

An accompanying useful mineral is overburden rock, namely granite as a building stone.

The hydrogeological and mining technical conditions for the development of the deposit are simple.

Technological studies of genthelvin ores were started in 1962. During the specified period of technological research, the possibility of beneficiation of ores using a gravity-flotation scheme with preliminary photoneutron sorting of machine class (+25 mm) was established, which ensures the

production of beryllium concentrate with a content of beryllium oxide ( BeO) not lower than 5%, with its extraction of 87-90%. According to laboratory and semi-industrial studies, commercial beryllium hydroxide with an extraction of 90-94% can be obtained from the specified concentrates using fluoride technology.

According to research results, the combined beryllium concentrate has a yield of 6.3% with 93.70% extracted. The ZnO content in the concentrate was 22.5%.

Beryllium (genthelvin) concentrate is recommended to be processed by the hydrometallurgical method in order to obtain both beryllium and zinc oxide. According to the conditions of development, two areas with open and underground mining are distinguished.

Information about mineral resources and reserves is confidential.

The degree of development : the area of underground mining is being developed by Perzhan Ore Company LLC.