



CRM of Ukraine Database Supplements

Mineral target:	Kapitanivske deposit
Commodity:	Nickel and cobalt ores

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Location: Kirovograd region, Golovanivskiy district, the central part and the north-eastern outskirts of the Kapitanivka village, 16 km southwest of Yemilivka railway station.

Exploration: The Kapitanivske deposit is confined to the ultramafic massif of the same name discovered in 1952. The deposit is divided into three sections - Northern, Central and Southern.

The central section was studied during prospecting and reconnaissance work in the period 1953-1959, the southern section was studied during reconnaissance work in 1993-2007. Within the Central and Southern sections, ore reserves were considered according to the protocols of the DKZ of the USSR dated February 14, 1959 No. 2594; dated 16.07.1959 No. 2735 and protocol of the State Geological Survey of the Ministry of Natural Resources of Ukraine dated 15.12.2010 No. 203. In 2018 a preliminary geological and economic assessment of the Kapitanivske deposit of chrome ores in the Central and Southern areas was carried out, as a result of which the reserves were tested by the decision of the DKZ of Ukraine (protocols dated 04/02/2019 No. 4744; 09/06/2019 No. 4903). The geological and economic evaluation of chrome ores was carried out by reinterpreting the results of geological exploration work carried out within the limits of the Kapitanivske deposit of chrome ores in previous years, taking into account modern economic conditions and linking the results of previous research and work with the requirements of current regulatory documents.

Geological characteristics: The Kapitanivske deposit of chrome ores is located in the Middle Pobuzhzhia region in the middle part of the Ukrainian Shield on the border of the Dnister-Buzkiy and Ingul megablocks of the Ukrainian Shield, within the Golovanivska suture zone.

The Kapitanivskiy massif is composed of basic and ultrabasic rocks - serpentinites, pyroxenites, and gabbro-amphibolites. Ultrabasics strike north-west, dip north-east, at an angle of 65-80°. Massif dimensions: 2500 m long, 50-60 m wide at the surface in the northern and southern parts, 200-250 m in the central part.

Chromium mineralization is represented by unevenly scattered ores and, to a lesser extent, massive ore bodies. The thickness of ore bodies varies from 1.1 to 12 m.

Dense, interspersed, and poorly interspersed ores with chromium oxide content of 20-60%, 20-22%, and 10-12%, respectively, are distinguished.

Nickel ores in the Kapitanivske deposit are lithologically controlled by serpentinites and are localized in the weathering crusts of ultrabasics, are placed in the spaces between the chrome ore bodies and are partially overlain by chrome ores. The intervals of nickel ores in wells are much larger than the intervals of chromium ores.

Gravitational ore enrichment schemes have been developed in laboratory conditions. The possibility of obtaining concentrates with a Cr₂O₃ content of 35-45% from rich and 35-42% from poor ores is shown. Gravitational technological schemes of semi-industrial research formed the basis of the development and calculations of enrichment schemes for loose and dense ores of the Kapitanivske deposit for the on-board Cr₂O₃ content of 15.01 and 6.0%, which corresponds to the original ore content of 28.25 and 13.5% Cr₂O₃. According to all options, concentrates are obtained that can be used for smelting ferrochrome alloys; of the refractory industry in the production of gunpowder instead of scarce magnesite scrap; foundry production; production of chemical compounds.

The southern part of the Kapitanivske deposit should be considered as an object of complex ores, the composition of which includes elements of ores of chromium, nickel, cobalt, gold, and platinum.

The hydrogeological conditions of the region and the deposit area are determined by their location in the southern part of the Ukrainian Shield, the geological structure of which includes Precambrian crystalline rocks and Meso-Cenozoic sedimentary piles. Aquifers in the Miocene deposits of the Neogene and the fractured zone of Precambrian crystalline rocks will participate in the irrigation of the field. The deposit is located on the left slope of the valley of the Mokra Derenyukha river at a distance of up to 1 km from the river bed. The largest water-bearing horizon is the horizon in the fractured

serpentines, the water inflow to the mining workings of the mine will be 94 m³/h. or 2256 m³/d, mainly due to the infiltration of atmospheric precipitation within the depression funnel.

The mining and geological conditions of the deposit are characterized by a steep dip (70-85°, up to 90°) and a sufficient depth of ore bodies (300 m), which led to the choice of an underground method of deposit development.

According to the features of the geological structure and the conditions of the formation and occurrence of mineral vein bodies, the Kapitanivske deposit is classified as a group of deposits with a very complex geological structure (group 3) in accordance with the Classification of Mineral Reserves and Resources of the State Mineral Resources Fund.

Mineral reserves: as of 01.01.2024, reserves are divided into the following categories:

cobalt-nickel-silicate ores: B+C 1 – 1574.0 thousand tons, incl. Ni – 12.0 thousand tons; Co - 577.0 t;
off-balance - 1494.0, incl. Ni 5.9 thousand tons; Co - 348.0 t;

chromium ores : C1 – 2966.18 thousand tons, incl. Cr₂O₃ – 452900.0 t; C2 – 521.4 thousand tons,
incl. Cr₂O₃ – 226,600.0 tons;

Degree of development: under development.