



CRM of Ukraine Database Supplements

Mineral target:	Nove deposit
Commodity:	Nickel and cobalt ores

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Location: Dnipropetrovsk region, Nikopol district, 5 km north of Pidstepne railway station, 28 km northwest of Nikopol city.

Discovery: discovered during exploration in 1950-1951 years, in 1954, the Ukrainian Geological Administration carried out searches and exploration of the Ternivske and Nove deposits, as a result of which reserves of nickel ores were approved under categories B+C1 (GKZ protocol dated 08/07/1954 No. 9164).

Geological characteristics: Precambrian crystalline rocks, their weathered crust and a layer of Quaternary and partly Tertiary sediments take part in the geological structure.

Among Precambrian rocks, gneisses are the oldest, which are found on the periphery of ore areas and are host rocks in relation to amphibolites, serpentinites, and schists.

Among the gneisses, ultrabasic rocks form 2 strips 300-500 m wide: the eastern one, which extends in the northern direction, and the western one, which is elongated in the direction from the southeast to the northwest. In the south, both strips merge. The eastern strip is composed mainly of carbonate-talc schist, among which there are 2 arrays of serpentinites measuring 300×300 m - the northern array and the 600×350 m southern array. Within the limits of the western strip, ultramafic rocks are represented mainly by serpentinites, schists are rare. Amphibolites lie between gneisses and serpentinites in the northern part of the western strip.

On the serpentinite massifs of the Eastern Belt, the weathering crust is represented by fractured carbonated serpentinites and ochres.

The structure of the weathering crust of serpentinites (ore-bearing sequence) is characterized by vertical zoning, namely: the zone of destroyed serpentinites; zone of nontronite and zone chlorite.

In the south of the western strip of ultramafic rocks, the weathering crust of serpentinites is represented exclusively by ochres. Within the isolated northwestern massif of serpentinites, the weathering crust consists of nontronitized chlorite and chlorite-talc rocks.

Among the Cenozoic sediments, the most common are sands and clays of the Quaternary system. In the weathering crust, clay-coal deposits of the Buchachkiy layer and gray clays of the Kyivskiy layer, washed from higher areas, are spread.

Within the extreme northwestern part of the deposit, on the bedrock bank of the Bazavluk River, Sarmatian clays of small thickness (up to 4-5 m) and loams (up to 8-10 m) appear in the column.

All types of ores were found at the deposit - nickel, iron alloyed and lightly alloyed. Ore-bearing within the deposit are only rocks of the weathering crust of serpentinites (ochres and fractured serpentinites) and areas of fractured schist in contact with serpentinites. All other rocks of the weathered crust of ultrabasic rocks, although being nickel-rich, but their nickel content does not reach the economic conditions.

A total of 5 ore lenses with a length of 200 to 600 m and a width of 50 to 250 m stand out on the area of the deposit, some of them break up into shallower bodies. At the same time, nickel ores are developed within lenses No. 1, 2 and 5. Iron ores alloyed with nickel are found in the area of the first four lenses. Iron-nickel ores - only in the area of lens #2.

The depth of the ore layer is: lens #1 from 25.05 to 60.20 m; lens #2 from 26.2 to 93.0 m; lens #3 from 18.2 to 33.4 m; lens #4 from 14.3 to 62.6 m; lens #5 from 16.95 to 44.65 m.

Nickel ores have an average thickness of 5.76 m. The nickel content in them varies from 0.7% to 3.0% (on average 1.17%). The content of cobalt in ores is low and does not exceed 0.1%. On average, the cobalt content in nickel ores is 0.05%.

The thickness of iron-nickel ores is 2.25 m; their nickel content is 1.08%, iron 40.25%.

The average quality of nickel-doped iron ores is 40.95% iron, 0.58% nickel, and 0.96% chromium.

The hydrogeological conditions of the deposit are complex. The deposit is located within the floodplain terrace of the Bazavluk River. The deposit has a main aquifer in alluvial sands, which

completely cover the ore layer. The specific flow rate of this aquifer is 1.1-4.0 l/sec. According to preliminary calculations, the expected inflow into the pit exceeds 400 m³/h. During the spring flood, the entire area of the deposit is flooded with water.

Mining and technical conditions are difficult. The method of development is open-cast, taking into account the complexity of the shape of the ore bodies, the inconsistent content of useful components, both by strike and thickness, and the location of the main reserves below the groundwater level.

Estimate of reserves: as of 01.01.2023, ore reserves are:

cobalt-nickel silicate ores / nickel, by category C1 – 1,058.0 thousand tons / 8.8 thousand tons; C2 – 265.0 thousand tons / 2.2 thousand tons;

cobalt-nickel silicate ores / cobalt, category C2 – 1,323.0 thousand tons / 491.0 tons.

Degree of development: not being developed.