

The deposit located on the left bank of the Dnieper river within the Zaporozhsky region of Ukraine is a part of the Nikopol manganese basin.

Geological sequence of the deposit is manifested by Archean and Proterozoic rocks, their weathering crust included, and Paleogene, Neogene and Quaternary sediments.

An ore bed 1.5 - 2.0 m thick (3.0-3.5 m at places) extends almost horizontally and consists of sandy clays with ore inclusions. Depending on the rugged topography of the area the undulated top of the ore bed plunges at depths from 40 to 110 m.

The manganese ore consists of oxide, oxide-carbonate and carbonate types.

1. The oxide (psilomelane and manganite) ore includes: a) lump and nodular varieties with the following content (in percent): Mn — 51.7,  $\text{SiO}_2$ — about 9, P — 0.149 — 2.05.

b) porous-aveolar ore (Mn-28.9-43.0,  $\text{SiO}_2$ —4.7— 13.5, P-O. 122-0.429);

c) earthy ore contains finely dispersed manganese (40.8%), silica (11.7%), phosphorus (0.309%).

2. The oxide-carbonate type content lies between that of oxide and carbonate ore. The ore is represented by lump-nodular, lump-earthly and lump varieties.

3. The carbonate type (manganite-calcite and calcite-rhodochrosite) comprises nodular ( lump), nodular massively banded and sandy oolitic varieties. Massive ores containing crystalline ore matter with manganese content varying from 25 to 30%, silica 8—10%, phosphorus 0.5—0.9% are the most adaptable to manufacture. Calculated reserves of 1582 million tons include 113.4 million tons of oxide ore (Mn—31.5%), 70 million tons of oxide-carbonate ore, and 1399 million tons of carbonate ore (Mn-23.4%).

Foreign investors are offered:

- exploitation of the deposit by underground mining;
- gravity-magnetic concentration providing the following results (table):

Type of ore	Oxide	Oxide - carbonate	carbonate
Extraction of manganese, in percent	75.3	77.5	77.0
Concentrate yield, in percent	52.8	59.8	44.8
Content of manganese in concentrate, in percent	40.2	36.2	29.7
Content of manganese in tails and mud, in percent	12.7	15.6	15.8

The hydrogeological problem is a complicated one owing to 6 water horizons. Tortonian (overlying ore bed), Oligocene (ore bed) and Buchak (underlying ore bed) yielding totally 400–500 m<sup>3</sup>/h are the most water-bearing. Compound dry water residue amounts to 0.4-1.8 g/l.

Waters of all horizons are useless for **drink**, water supply due to a heightened content of iron (0.04-4.0 g/l), manganese (0.02-4.0 mg/ l), fluorine (0.01-1.62 mg/ l). Water containing sulphate ions is **aggressive** to concrete produced from **portland** cement.

Favourable location of the deposit includes a well-developed network of automobile roads, wharfs on the bank of the Dnieper river, two railroads cutting the area of the deposit and the third one running for 20 km nearby.

The permit for land exploitation will be received in due time.

The region faces no problem with manual labor. Underground mining will not much disturb the ecology of the area.

Besides investments foreign partners will have to provide the mine with modern production equipment and ore-dressing plant.

Manganese concentrate is widely used in more than 20 industries of the East European region. Market requirements **quarantee** profit of the joint venture.

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