- A high NBS hygroscopicity allows to fasten the high humidity of the upside ball of the dust materials, decreasing dust emissions from the upside areas of the mine refuses storages;

- At optimal charges of NBS 1,5-2,0 kg/m^2 air dust emissions at outlet from the timbered area of mine refuses storages in 4,6-16 times less than at outlet from the ordnance datum taking into account the basic wind speeds;

- In order to block dust upsides during the short period we can use NBS with the concentration less than 100%.

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SECTION "MINERAL PROCESSING"

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SUBSTANTIATION OF EXPEDIENCY OF INVOLVING STOCKPILED WASTES INTO PRODUCTION AT CENTRAL ORE-DRESSING AND PROCESSING ENTERPRISE, PJSC

Economical use of physical resources is of significant importance for improving the efficiency of public production since the national economy demand for raw materials and supplies is increasing steadily, while their production is becoming more and more expensive.

From extraction to obtaining finished products, raw materials undergo a large number of stages of processing. As a result of this process, only part of the production is used as intended, whereas the remaining products are stored in disposal areas and tailing storage facilities.

One of the enterprises of the Kryvyi Rih iron-ore basin, which mines and concentrates magnetitic quartzites, is PJSC Central Ore-Dressing and Processing Enterprise (PJSC "CODPE"). Approximately 30% of mineral raw materials extracted at this at production site is headed for metallurgical treatment in order to obtain cast iron, while considerable part (70%) is stored as wastes.

Previous research showed that the wastes of the enterprise contain valuable components; that is why it is expedient to consider them as sources of additional products.

Involving stockpiled wastes of the PJSC Central Ore-Dressing and Processing Enterprise into production will make the following possible: firstly, to reduce the territory of tailing dumps and decrease the negative impact of discharges into the environment; secondly, to additionally obtain both iron-ore concentrate and other marketable products to be used in various sectors of the national economy.

In this regard the following tasks are to be solved:

- to study material composition of dumping sites and mature tailings of the PJSC "CODPE" along with defining their mineral composition, sizing characteristics, physical properties (gravitational, magnetic, electrical ones);

- to conduct engineering studies on dumping sites and mature tailings of the PJSC "CODPE" to develop an integrated technology for obtaining sellable concentrate and additional products.

During elaborate study on each of the objects, it was established that when stockpiling the dumping sites different methods for dumping were used which influence considerably their further involvement into production of standard quality raw material:

- those which considered their further use (dumping site "Pivdennyi"), where sites of valuable components have been purposefully formed within the outlines of this technogenic deposit;

- those which did not consider their further use (dumping site No.6, South-West dumping site, the inner dumping site); mineral compo-

nents are distributed in a random way within the outlines of these arrays.

These will influence significantly the process of reworking dumping sites.

The analysis of the research studies showed that dumping site "Pivdennyi" is presented by two major locations of valuable components: oxidized banded iron formations and indurated talc.

From the site of oxidized banded iron formations, at this stage of research substandard hematite-martite ores can be involved for obtaining sintering ore from them. According to the recommended technology, from the source raw material with 43.8 % assay, it is possible to obtain sintering ore with 55.2 % assay with yield of a product of 36.9 % and product recovery of 46,5 %.

Obtaining hematite concentrate from stored oxidized quartzites requires more detailed research into peculiarities of physico-chemical and mechanical properties of raw material considering the influence of atmospheric phenomena on it.

Based on the conducted research, variations on process flow schematics on raw material processing using selective extraction of talc-magnesite raw materials are considered: difficult ones - carbonated serpentinites and moderate ones – talc-carbonate rocks.

It is shown that treatment schemes differ critically by degradation coarseness which makes 85% of the class -0.074 mm for carbonated serpentinites, for talc-carbonate rocks – 78% of the class -0.074 mm, at stagy I of degradation, and, respectively, 93.5 and 95.7% of the class -0.074 mm, at stage II.

The tailing storage facility of the PJSC "CODPE" also features certain peculiarity of its formation, which distinguish it among tailing storage facilities of other ore-dressing and processing enterprises of Kryvorizhzhia.

This peculiarity involves simultaneous filling of containers and dropping of a pulp from pulp lines in one place (in the top of the bar), which has created favourable conditions in the tailings storage facility for gravitative differentiation of the solid phase of the pulp and creation of a dimensionally isolated, rather large iron fortified area, which is suitable for immediate selective mining. The dimensions of this area

make 1.3 – 1.8 km across the width, over 2 km lengthwise and up to 3 – 20 m by capacity.

Wastes of the ore-dressing plant, which accumulate in the tailings storage facility, are considered as raw materials for recleaning. The research showed a possibility of using earlier warehoused tailings of wet magnetic separation of the "CODPE" PJSC as additional raw materials for obtaining saleable concentrate and mortar sand.

Considering the above-described we can make a conclusion we can make a conclusion that the material stockpiled at dumping sites and tailing storage facility of the PJSC "CODPE" forms "technogenic" deposits which can be involved into production to obtained finished products, whose uses are diverse and include: 1) metallurgy industry (magnetite and hematite concentrates); 2) construction industry (crushed aggregate, sand, limestone, clay, structural stone); 3) paint and coatings industry (mineral pigments); 4) agriculture (mineral fertilizers).

To involve stockpiled production wastes, apart from additional studies on finding optimal parameters of the technologies, the enterprise is to transfer them to the status of technogenic deposits and obtain a license for their development.

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METHOD FOR PROCESSING OF METALLURGICAL AND FLOTATION WASTE AND IMPOVERISHED ORES

The entire extraction of metals from impoverished ores through the classical methods of mineral processing meets many difficulties in the practice. The application of these methods to the treatment of metallurgical waste often does not lead to the desired results.