

inconsistent value that changes through time and depends on the changes of current stripping ratios at the rival opencast mines.

Thus in order to determine the boundaries of projected opencast mine the economic stripping ratio should be determined with consideration of possible change of volumes of overburden extraction and ore extraction at base rival plants, i.e. with consideration of change of their current stripping ratios.

It was proved, that the deviation of end depth of development of conventionally projected opencast mine, determined based on the comparison of its current stripping ratios with current stripping ratios of conventional base rival opencast mines, from the end depth of development determined with economic stripping ratio may amount to 14 to 45%.

As a result, the theory in the area of determining end boundaries of opencast mines was enhanced.

The new method differs from the existing ones by the accounting of change of economic stripping ratio through time, as well as the determining of influence of technological factors of rival opencast mines on the end depth of the projected opencast mine.

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**Y.I. HRYHORIEV**, Ph.D (Engineering), assistant

**Y.M. NAVITNIY**, Ph.D, assistant professor ,

**S.O. FEDORENKO**, Senior Lecturer of the Department

of Open Pit Mining, Kryvyi Rih National University, Ukraine

## **METHOD OF FORMATION OF TECHNOGENIC DEPOSITS OF BULK TYPE USING OREPASSES**

The growth of the volume of material production increases the need for mineral raw materials, so volumes of mining, which promotes the search for new sources of mineral raw materials.

Modern world trends in the implementation of resource-saving technologies encourage as a source to consider waste mining and concentrating production, which occupy large areas of fertile land and worsen the environmental state.

In addition, the attraction of such waste to secondary processing is due to the complication of mining and geological conditions and the cost increase of the process of extracting mineral raw materials directly from the depths.

In most cases, the development of bulk technogenic deposits is economically feasible. This is due to lower costs for the preparation, excavation and transportation of rock mass. Also, the terms of development of technogenic deposits are much smaller than geogenic, since the period of disclosure is much shorter or completely absent.

In addition, it is necessary to develop an effective scheme for the development of technogenic deposits, based on indicators of the state of the rock massive, mining technical conditions of development, as well as the method of disclosure and formation of the working zone.

Such technology of working out of technogenic deposit was developed. Formation of technogenic deposits takes according to usual technology adopted by the company for the dumping.

The development of technogenic deposits is following the next scheme. On the board of technogenic deposits on supports constructed system of open orepass.

Pneumatic wheel loaders move on the surface of the technogenic deposit, excavate the necessary kind of raw material and deliver it to the receiving capacity of the orepass. The gravity is delivered rocks to the vibrating feeder and transmitted to the railway transport.

It was found out that the technical and economic parameters of the company influence not only the accepted complexes of mechanization, but also the ratio of the main parameters of the technogenic deposit.

Therefore, the next step of the study was to analyze the connections of the main parameters of the technogenic deposit.

In the course of the research, it was determined that the capacity of the technogenic deposit influences the specific cost of its formation and development.

Thus, with an increase of the volume of technogenic deposits, the specific costs of its development are reduced, while the specific costs for the formation of technogenic deposits are increasing.

This is due to the increase in the distance of the transport of overburden in the period of formation, which depends on the number of tiers in the technogenic deposits.

Also, the cost of working out is influenced by the distance of transportation of dry mineral raw materials on the technogenic deposit surface, as the size of the deposit increases the range of transportation of the rock mass to the orepass, accordingly, the productivity of the loader decreases.

It has been shown that the technical and economic indicators of the enterprise is influenced not only by complexes of mechanization, but also the ratio of the main parameters of the technogenic deposit.

Therefore, the next step of the research will be to analyze the interdependence of the main parameters of the technogenic deposits.

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**V.K. SLOBODYANYUK**, PhD (Engineering), Associate Professor, Kryvyi Rih National University, Ukraine

**S.YU. PENKAL**, student, Kryvyi Rih National University, Ukraine

## **DESIGN OPTIMIZATION OF THE SHOVEL RELOADING POINTS FOR THE ROAD AND RAIL TRANSPORT**

The department of open pit mining operations at our University is continuously being carried out the researches aimed at improving the transport system of deep iron ore open pits [1-4]. Byzov V.F., Prof. Dr.-Ing., paid much attention to the issues of road and rail transport optimization. The location of reloading points directly in the working area of open pit mines using the road and rail transport leads to the complication of transport flow chart. Because of the need to bypass the rail dead-end tracks, the truck haulage distance significantly