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## Perspective Of Using Muruntau Career's Overburden As Back Up Sources Of Raw Materials

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### ABSTRACT

In given article questions of perspective use breeds of open-cast mine Muruntau as a reserve raw source are reflected. On the basis of the analysis it is established, that ore of the raised quality, and ore went to an initial stage of development of a deposit for processing more poor quality concerned to for the balance to stocks and collected in warehouses. Therefore the mountain weight saved up in sailings for today represents certain interest as gold-bearing raw materials, essentially suitable for industrial processing for the purpose of reception of additional quantity of gold.

### KEYWORDS

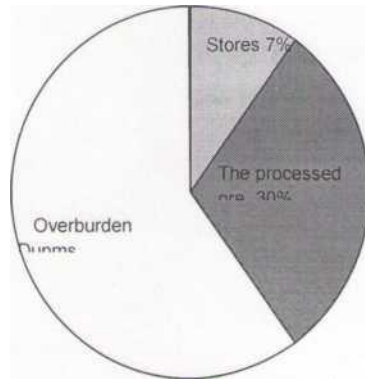
Quarry, depth, rocks, physico-mechanical properties, certain, depth of works, engineering structure, the factor of stability, reserve, grip rocks, the weight of the array.

### INTRODUCTION

Decrease the average content of processed ore, while working out of reserves of Muruntau deposits, under simultaneous cost increase, forced to pay close attention on the involvement in the processing of gold ore

overburden, no value to a certain stage of development of the deposit. The situation has changed now, because the perspective of mining and processing complex on the basis of this field is largely determined by the possibility

of using such rocks are not only accumulated over 40 years of career in the dumps, but also planned to maximize in future. Therefore potential overburden considered as a backup source of raw materials.



**Fig. 1. Distribution of Career Muruntau extracted rock mass**

For quick impact during the construction of career in the early period of the development high-quality ore were sent for processing and ore of lower quality treated to off-balance sheet reserves and accumulated in the warehouses. This focus on off-balance processing of ore with a series of diminishing content was adopted as a promising direction in the development of mining and processing complex at the base of the deposit Muruntau almost since the beginning of its existence. To do this in the early years in the career Muruntau was separate production and storage of merchandise and off-balance ore and overburden. The distribution of the extracted minerals at the Muruntau deposit presented in Fig. 1.

Therefore, accumulated in dumps rock mass is of some interest as the gold raw materials, principally suitable for industrial processing in order to obtain additional quantities of gold. Currently, the area occupied by depots and

dumps, is 13,5 km<sup>2</sup>, and their height varies from 35 m to 180 m. Volume weight of loosened rocks in the initial period of filling the dumps was 1.73 t/m<sup>3</sup>, and then as a result of conglomeration increased and reached 1,90-1,96 t/m<sup>3</sup>.

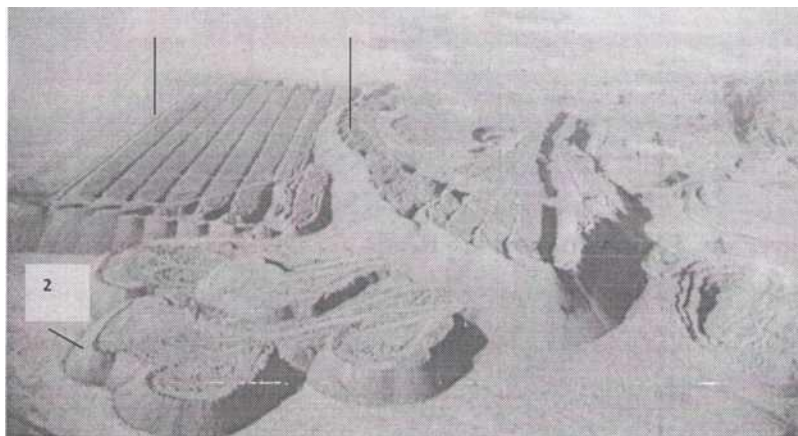
For real-mineralogical composition, dumps are stacked by debris: slates kvartsevosludistyh - 40%; carbonaceous siltstone-18%, carbon-mica schist - 7%; feldspar-quartz sandstone and metaalevrolitov - 27% quartz, 8%.

The mineralogical composition of rocks in the dumps and depots: quartz (54.8%), albite (7%), spar potassium (9.8%), biotite (6.3%), chlorite (2.5%), sericite (3%), carbonate (3.3%), sphene (0,98), pyrite (1.34%), arsenopyrite (0,41%).

Secondary changes in the dumps (sulfides oxidation, the formation of secondary minerals) are discovered after three years of rocks storage, but after 15- 20 years, under the influence of atmospheric oxygen and atmospheric precipitation sulfides are oxidized to 70%, new formed clay minerals appear. Dumps have horizontal bedding with brownish-gray tint of varying intensity. Career Muruntau dumps are formed by using the road and conveyor transport (Fig. 2).

## MATERIALS AND METHODS

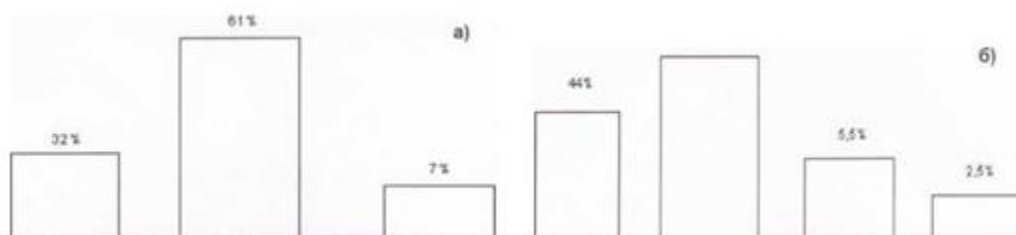
At the same time rock mass is sent there from different career zones, each of them is characterized by a certain distribution of content and by features of the technological properties of the rock mass. The difficulty of working out these dumps and depots that they don't have layers, veins and zones intrinsic to natural deposits, which give a regular distribution of useful components.



**Fig 2. Conveyor (1) and automobile (2) dumps of Muruntau**

Study of rock granulometric composition in the dumps with the road and conveyor transport revealed that the amount of pieces with size of -20 mm, +20 - \* • -200 mm; +200 - 400 mm and 400 mm in them are different (Fig. 3).

This is explained by the fact that the rock and ore being transported by pipelines, rocks of ore are crushed preliminarily, so there are no pieces larger than 400 mm in such dumps. In addition, there is a change in the proportion of small pieces (-20 mm) and medium pieces (+20-\*--200mm).



**Fig. 3. Distribution of grain-size composition of the rock in dumps in the car (s) and conveyor (b) transport**

Structural features of dumps building predetermine their estimate of the technological possibilities of selective working out for further conditioning receipt of the ore mass. It is necessary to solve the following tasks:

Examine granulometric composition of rocks in the dumps, formed by using different

technologies of transportation; Value the distribution of gold in the dumps;

1. Estimate the number of conditioned ore weight in the dumps;
2. Consider the specificities of dumps formation using various technologies of its transportation;

3. Consider the development technique depending on their forming technique.

Assessment of the ore mass quality, potentially suitable for processing as a

reserve of raw materials, is based on the dependence of its number of car dumps and dumps from the CLT on cutoff grade. Statistical analysis of testing results showed that gold content in the overburden in the depths is distributed according to a logarithmic law, and in the dumps - is close to the normal law (Fig. 4).

It should be noted that in the car dumps gold is distributed more contrastly ( $k_{\text{ravn}} = 1.65$ ) compared with the conveyor dumps ( $k_{\text{ravn}} = 1.14$ ). These differences are explained by the fact that pipeline transport has higher blend abilities in compare with road transport. At the same time when on-board content 0.5 g/t extraction of the reserve ore mass is preliminary estimated as 25 - 30%, and when it reduced to 0.4 previously estimated to be 35 + -40%. Naturally, that the different degree of averaging of the ore mass requires different approaches to the development of such dumps, and the obtained data allow to consider the dumps as anthropogenic deposits, requiring the same approach as to deposits of natural origin.

Analysis of geological structure and technology of opencast Muruntau deposit, also analysis of methods for forming depots and dumps can draw the following conclusions: unproved ore warehouse and more complex - dumps, that is, the complexity of the internal structure of anthropogenic mineral formations of Muruntau career is

inversely related to gold content, which is put into the rock mass.

When choosing the technology of warehouses and dumps development in Muruntau career, the complexity of their internal structure should be taken into account.

## CONCLUSION

Described methodical approach to the choice of technology development anthropogenic mineral formations of Muruntau career, tested with the implementation of technology of heap leaching. In particular, during the study of unproved ore warehouse with capacity of ore deposits 37 m, was found that its internal structure allows to lead volume excavation with working face averaging, because parts of sub-standard ores have a capacity of not more than 1,5-2,0 m with an area of 10-15 - 40-50 m. This averaging was implemented through the development of a warehouse inclined strata (angle of slope 25°) at full height with the help of bulldozers, that let to maintain the average inner qualities of rock overburden (thickness of deposit 50 m), it was found that the power of subquality inclusions reaches 3-5 meters in area 500 m<sup>2</sup>.

Thus, the experience gained during the development of anthropogenic mineral formations of Muruntau career suggests that overburden dumps are typical anthropogenic which should be considered as a backup source of mineral raw materials. It should be treated the same to to the development of such deposits as for natural deposits.

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