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Surveying Monitoring and Classification of Under-Worked Areas by the Degree of Their Suitability for Further Use for Economic Purposes.

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ABSTRACT: There is given the information about the rapid growth of industry and digging of minerals in the land of surface, after finishing to study of using in business purposes by mine surveying monitoring and worthy of geomechanicguarantec in group of tables.

KEY WORDS: subsurface, geomechanics, deformation, liquidation, monitoring, occurrence, minerals, indigenous, hydrogeological, thicker rocks, favorable, relatively favorable, adverse, endangered, threatening, unfit.

I. INTRODUCTION

The rapid growth of industry, observed in the last century, was accompanied by a significant increase in the development of the earth's interior. This led to the fact that large areas suitable for living, turned out to be part-time mining. To ensure the safe operation of the moonlighting facilities, the geomechanical justification of the possibility of their moonlighting and their further geomechanical support was legislated.

Under the geomechanical support of the development of the earth's subsoil is understood to solve the problems of stability of underground facilities and control of deformation of their host rocks and the earth's surface, determining the impact of underground facilities on their environment and engineering structures during the construction and operation of facilities, and during their reconstruction and especially-liquidation. The main purpose of geomechanical support is to prevent accidents during the development of subsoil, improve the safety and efficiency of mining operations, ensure the safety and normal operation of buildings, structures and engineering networks falling into the zone of their influence, and protect the natural environment.

During the construction of mining enterprises, additional work was accompanied by the problem of the safety of the objects being worked. During this period, various methods of monitoring and protection were developed, aimed at ensuring the safety of the working objects[1,2,3].

II. SIGNIFICANCE OF THE SYSTEM

Over the past twenty years, the problem of construction of buildings and structures on the areas of occurrence of minerals has changed radically. During this period, there was a massive, previously unprecedented scale, the liquidation of mining enterprises, in connection with which the volume of construction in the previously mined areas began to exceed the volume of construction in the areas subject to mining. The problem is significantly complicated by the fact that after the liquidation of the mining enterprise, geomechanical and hydrogeological processes in the rock column and on the earth's surface continue, and the ability to manage these processes due to the lack of access to the mine workings is reduced.

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III. LITERATURE SURVEY

The growing anthropogenic load on the subsoil and the earth's surface poses a serious threat of major accidents. The first signs of such a threat are beginning to manifest themselves in the form of large-scale destruction of residential areas. For example, in Osinniki (Kuzbass) over the mining operations of the mine "Capital" on a gentle slope was located about three thousand buildings. No damage was observed in these buildings during the operation of the mine. Some time after the liquidation of the mine, all the buildings along with the slope slid down and received severe damage. Analysis of this accident showed that during the construction of buildings during the operation of the mine, there was intensive pumping of water and its level was significantly below the potential slip surface. After the closure of the mine and the cessation of pumping water, its level rose strongly and flooded the potential slip surface, which in turn led to the sliding of the surface of the slope on which the village was located.

Of particular concern is the accumulation in the bowels of the Earth of voids formed during mining. The collapse of these voids is manifested by large sinkholes on the earth's surface, causing the destruction of buildings and structures falling into these sinkholes.

To identify on the earth's surface places of possible formation of failures and their effective surveying monitoring, it is advisable to conduct surveying instrumental observations in conjunction with geophysical studies. For example, the use of gravimetric or seismoacoustic methods of measurements of the massif allows to identify the places where the decompression of the mountain massif was formed. Further, the district created a comprehensive monitoring station system consisting of reference points on the earth's surface, buildings and structures and deep frames that are placed in wells drilled in areas of possible educational failure.

There are several ways to measure the magnitude of the displacement of rocks using deep reference points, differing in the design of the reference points and methods of fixing their movement [4]. The most proven in practice magnetic-reed method of measuring deep reference points which is implemented by installing in the well at a certain interval of deep reference points-ring magnets and further fixing their location with a special sensor passed through the established reference points.

IV. METHODOLOGY

The observations carried out at the specified station allow to give a quantitative assessment of geomechanical processes, to estimate their dynamics and if necessary to take timely measures for management of these processes.

From the above it follows that for the timely detection of signs preceding the occurrence of emergencies, it is necessary to conduct a full-fledged surveying and geomechanical monitoring, including observations of deformations of the rock mass, the earth's surface and buildings and structures falling into the zone of influence of mining operations.
Surveying monitoring of the displacement and deformation of the rock thickness in areas inaccessible to direct observation is carried out with the help of deep benchmarks laid in existing or specially passed wells from mine workings or from the earth's surface.

A very important point in the implementation of geomechanical monitoring is to conduct it according to a single methodology by all organizations engaged in the production of instrumental measurements in the zone of influence of mining operations. Only then the data obtained as a result of such observations will be suitable for interpretation, which will certainly allow to obtain more reliable information about the parameters of geomechanical processes caused by anthropogenic impact on the earth's subsoil during their development.

From the above it follows that the most dangerous manifestations of these processes are failures on the earth's surface and its flooding. Today on the basis of researches the classification of conditions of use of the underworked territories which entered the standard document "the Methodical management about the order of allocation of failure of dangerous zones" is made.

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V. EXPERIMENTAL

When compiling the classification as the main classification feature adopted the height of the collapse zone of the overlying thickness, determined from the expression:

$$M \le \frac{30\sqrt{S}}{(1{,}05 + 0{,}2K_i^2)f}$$

where M is the height of the zone of collapse of the overlying strata above the production, m; S - cross section generation is rough, m2; f is the strength coefficient according to Professor M. M. Protodiakonov; K_t- coefficient taking into account the residence time of formulation in the array, which is determined by the expression

$$K_t = 50/(50 + t)$$

where t -is the lifetime of the development in the thickness, year.

Class	Characteristic	Option	Use conditions
Favorable	Areas under which there are no cavities in the thickness of rocks.	Areas under which the workings laid waste rock in the process of liquidation of the mine.	Use of territories without restrictions.
		The territories under which the discovered cavities in the thickness were eliminated artificially and the process of displacement ended.	Use of territories for agricultural needs without restrictions, for other purposes after additional surveys.
Relatively favorable	The areas under which the mine workings are located at a depth of more than 60m at the fortress. 10<f <14 .	*H>M*	Use of territories for agriculture and for construction of constructions of the 3rd and 4th category specified in the existing Rules of protection with application of preventive measures of protection.
Adverse	The areas under which the mine workings are located at depths from 30 to 60 m at the fortress of rocks 6 < f<10 .	*M30<H<M60*	Use of territories for needs of agriculture and for construction of constructions of 4 categories, with application of construction and special measures of protection.
Endangered	Areas under which the mine workings are located at depths of less than 30m at rock strength *2< f< 6*	*H<M*	Construction of structures is not allowed. Limited use of territories under forest Park zones and for construction of utility rooms under supervision of supervision.
Threatening	Areas of territories in the zone of influence of workings, having access to the earth's surface (trunks, pits).	Backfilling of mine workings with rock to the level of the earth's surface.	Territories are not subject to use. Near the trunks, a reserve of rock is created for additional filling as the soil subsidence.
Unfit	Areas of territories in the zone of influence of workings having an exit to the earth's surface (trunks, pits, etc.).	Installation of strong shelves in the development and filling the space between them with weak subsidence rock	Territories are not subject to use. Around the mouth of the trunk at a distance determined by the project, a strong fence with a height of at least 2.5 m and a drainage ditch are erected, danger zone signs are installed.

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VI. CONCLUSION

It is established that different underworked areas can be used in different ways in economic needs.

On the basis of this, the classification of under-worked areas according to the degree of their suitability for further use for economic purposes is made. As the main classification feature, the height of the collapse zone of the overlying thickness, which determines the degree of potential danger to objects located in the mined area, is adopted.
This classification is aimed at improving the safety and efficiency of the development of the mined areas by timely determining the degree of potential danger, depending on the nature of the mining and the planned conditions of use of the mined area.

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