MONITORING OF EXOGENOUS GEOLOGICAL PROCESSES IN STARY OSKOL - GUBKIN MINING REGION OF KURSK MAGNETIC ANOMALY

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Abstract

The article discusses the necessity of monitoring of exogenous geological processes in Stary Oskol - Gubkin mining region of Kursk magnetic anomaly. As well as the peculiarities of the region Stary Oskol - Gubkin -mining site for the organization and management of geological environment monitoring components.

Keywords

Geological environment, Kursk magnetic anomaly, monitoring, Stary Oskol - Gubkin mining region, geological environment monitoring components, exogenous geological processes.

Since the 50s of last century, production scale and processing of mineral raw materials in Stary Oskol Gubkin-mining site is constantly growing, and correspondingly increase the rate, extent of change of geological environment components. This circumstance is due to the relevance of the need to organize and maintain an effective system of monitoring various kinds of impacts on the geological environment.

The aim of our study is to identify the characteristics of the organization and management of geological environment monitoring components in Stary Oskol Gubkin -mining site

To achieve this goal, it highlighted a number of interrelated tasks:

1. To consider the possible changes in the components of the geological environment Stary Oskol Gubkin -mining site.

2. To analyse of the necessity of organizing and conducting the monitoring of the area studied

3. To identify the features of the region Stary Oskol Gubkin -mining site for the organization and management of geological environment monitoring components.

Thus, **the object** of our study will be the change of rocks, soil or artificial soil; relief and groundwater; as well as geological and engineering-geological processes and phenomena in Stary Oskol Gubkin -mining site. **The subject** will be Stary Oskol Gubkin -mining site district.

It should be noted that, under the geological environment we mean any rocks and soil forming the upper part of the lithosphere, which are considered as multi-component systems, which are under the influence of engineering and human economic activity, with the result that there is a change of natural geological processes and the emergence of new anthropogenic processes, that, in turn, causes a change in geological conditions territories (Sergeev, 1979) [2].

The geological environment changes in Stary Oskol Gubkin -mining site are varied. Some of them are planned and design in relation with the need to perform engineering works or exploitation of mineral deposits. Others occur when the natural balance and correspondences in the geological

environment is violated or when the originating and development of geological processes occur. The modern exogenous geological processes of the area under study, we have identified in Table 1.

Table 1: Exogenous geological processes of Stary Oskol, Gubkin district

No.	Geological processes	Manifestation in the geological environment
1	Karst and suffusion	Sinkholes; suffosion depressions
2	Water	Growing ravines and gullies; bottom bumping into beams; Lots defeat flush surface soil; waterlogging
3	Gravitation	Landslides and landslide areas
4	Eolian	Hilly sands and dunes
5	Antropogenic	Active mining in quarries, road and hydraulic engineering, agricultural work.

In order the changes of the area, the geological environment, both the inevitable and unintended, do not exceed the permissible limits, they are controlled, ie there are some activities for their prevention, control, on the rational use and protection of their territories, and after the execution of engineering works land reclamation is carried out. To meet these challenges the constant monitoring of the geological environment system is required[6].

The monitoring of the geological environment suggests a system of continuous monitoring, assessment, prediction and management of geological environment or any part of it, carried out on a pre-scheduled program. (Korolev, 1995). The necessity of organizing and conducting monitoring of the geological environment components is defined by the provision of optimum environmental conditions for the person within the considered natural-technical system [3].

The Peculiarity of Stary Oskol Gubkin mining site is mining companies. It is one of the main objects significantly transforming the upper part of the lithosphere. Open ways of mining dramatically change all of the components of the geological environment. There is a strong transformation of the relief area where the gradient of heights is up to several hundred meters. As a result of anthropogenic impact, there was a radical transformation of the landscape; large quarries emerged in this area.

That is why it is important to understand that special attention should be given to monitoring human exposure to the mining industry. Monitoring shall be comprehensive and based on specialized technique. Methodology and methods should include a processing unit and visualization of geo-ecological information, as well as to ensure effective environmental management. [4]

All this is necessary to improve the degree of geological, hydrogeological, engineering-geological, geodynamic and environmental study of the area of Stary Oskol-Gubkin mining site. Qualitatively conducted monitoring of the geological environment components in the region is able to:

1. ensure the rational and safe use of mineral resources;

2. minimize the pollution of ground and surface water;

3. assess and reduce the impact of man-made and natural processes on the geological environment;

4. provide information about the manifestation of adverse exogenous and endogenous processes, on the basis of which it is possible to justify measures to prevent or mitigate their consequences;

5. develop practical recommendations for the protection and rational use of natural resources[5].

Thus, for the organization and management of geological environment monitoring components in Stary Oskol-Gubkin-mining site we should take into account a number of features. One of them is a long man-made impacts on the geological environment of mining enterprises. In this regard, special

attention should be paid to process ores, as this leads to disruption of the stability of the geological environment. It is accompanied by an increasing seismic activity, a manifestation of Earth's surface subsidence, groundwater breakthroughs in mine workings and mine flooding, formation of gaps at the point of flooding. A system of targeted continuous monitoring of ecological and geological systems, assess their condition and prognosis of development of geologically sound management decisions to optimize the ecological functioning of these systems. The components of the geological environment monitoring system in Stary Oskol-Gubkin mining site should also include not only engineering-geological analysis of the area under study, but also ecological and geological analysis. This will help to determine the sensitivity of the geological environment to anthropogenic influences, and its stability [1].

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