

Problems and Optimization in Geological and Mineral Resources Exploration

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Keywords: Geology, Mineral resources, Exploration, Problems and optimization

Abstract: In recent years, with the continuous progress and development of social science and technology in China, the consumption of mineral resources is increasing. Therefore, the exploration personnel of mineral resources should attach great importance to this. Due to the limitation of traditional geological and mineral resources exploration technology, it is difficult to adapt to the rapid development of modern society, to meet the needs of the times. This paper mainly discusses the problems existing in the exploration of geological and mineral resources, and puts forward some feasible countermeasures according to the actual needs.

1. Introduction

The 21st century is an era of artificial intelligence, big data and information technology. Various applications of science and technology have played an indispensable role in promoting the production and development of human society, the efficient utilization of mineral resources is of great help to the improvement of our society's huge demand for energy. This makes the application and innovation of mineral resources exploration technology become more and more important. The geological and mineral resources exploration involves many problems, is also quite complex, to the technical application request is higher, therefore, needs the related staff to formulate the feasible development countermeasure according to the actual situation, improve the technical level in this area. Because our country in the geological mineral resources exploration research aspect, generally starts quite late, therefore, from the technical level, the theory application also has the certain insufficiency, it is still necessary to strengthen the research work on this aspect, pay considerable attention to it, give full play to the technical advantages and innovative efficiency of geological and mineral resources exploration, and meet the objective requirements of the development of socialist construction cause at present, for our country each construction enterprise development provides the powerful mineral material guarantee.

2. The Process and Importance of Geological and Mineral Resources Exploration

In the past ten years, the technological progress and development of our society is rapid, but behind the rapid development, we need to support through certain scientific and technological innovation and material security, so, mineral resources can not be lacking in the first place. For the vast number of geological enterprises, mineral resources exploration needs to be combined with many geological conditions and environment, during the exploration, to develop a reasonable technical exploration methods, in the initial stage of the whole investigation project, it is generally through professional and advanced technical equipment and professional personnel to lay a solid foundation for the follow-up investigation work. In the initial stage of investigation, we should sum up the problems encountered in engineering investigation to carry out investigation, and put forward corresponding countermeasures and schemes reasonably, and ensure that the problems encountered in the course of investigation should be solved in time. Relevant personnel will usually work out different investigation and design plans based on investigation maps, so as to truly ensure the effectiveness and quality of geological and mineral resources exploration, and adjust technical parameters in a timely manner, to meet the needs of current geological exploration resources and environmental changes, so as to better complete a series of geological exploration work. The results of geological and mineral resources exploration will have a direct impact on the results of

geological and mineral resources development, so it has a high overall comprehensive, and the relevant personnel must pay great attention to it, high-end detection equipment is required for detection. if only from the relevant personnel and perspective analysis, it must have a high degree of professional geological exploration capacity and accumulated rich practical experience, from the enterprise level, then it is necessary to engage in geological and Mineral Resources Exploration Enterprise qualifications for a comprehensive assessment; From the institutional level, then we need to combine our current mineral laws and regulations to analyze. These different conditions are the main determinants of the viability of the entire development project. From the investigation and analysis of geomorphology, geological structure and mineral resources to understand the local development is suitable for a new direction, a reasonable design for this and the corresponding geological and mineral resources exploration report, master the specific project development process, combined with the actual situation to formulate feasible exploration objectives.^[2]At present, although China's mineral resources exploration technology is developing rapidly, there is a certain gap compared with the developed countries in Europe and the United States. But the mineral resources department of our country has paid great attention to this aspect, and has been supporting the local exploration enterprises to engage in geological exploration. However, due to the backwardness of technology and the high social consumption of mineral resources, it leads to the appearance of many contradictions, which indirectly leads to the invisible waste of mineral resources in China. Based on the above, we should improve the efficiency and level of geological and mineral resources exploration in China, and work out reasonable countermeasures and plans according to the actual situation, to further improve China's geological and mineral resources exploration technology innovation capacity.

3. Overview of Geological Exploration Technology of Mineral Resources

3.1 Seismic Reflection Technology

The seismic reflection technique is one of the most common techniques used in the current geological exploration of mineral resources in China. Its general exploration principle is to realize the exploration of geological minerals by means of seismic wave simulation, the transmitted information is then collected from the data source^[1]. In the course of operating seismic reflection technology, there are many different aspects of the problem need to be concerned and attention. Specifically, there are the following aspects of content. First, the reflection of data may lead to the deviation of data collection because of the great difference in geological environment. In the course of actual investigation, only paying attention to the problem of interference source, can we take corresponding measures to control it. It becomes very important to identify the source of the interference.

3.2 Technology of Remote Sensing Surveying and Mapping

The application of remote sensing surveying and mapping technology in the exploration of geological and mineral resources is quite frequent, and this technology is relatively advanced in general, with strong technical surveying and mapping ability, and belongs to a kind of innovative technology^[2]. In the course of investigation, advanced satellite technology is used to locate and analyze the investigation site, collect data and then present it in the form of three-dimensional imaging, and intelligent technology is used for modeling, thus, geological and mineral resources exploration can be completed.

3.3 Geological Mapping Technology

The greatest advantage of geological mapping technology is the high efficiency and accuracy of exploration, compared with other exploration technology, the practical application is also relatively strong^[3]. At present, the technical investigation is carried out by means of certain technical equipment, and its application scope is expanding day by day. In the process of using geological mapping technology, technical surveyors should combine the geological scale to carry out

investigation and adjust the scale reasonably. When the exploration result is formed, it can be calculated with a certain formula to provide more necessary data support for the subsequent development of mineral resources.

3.4 Satellite Positioning Technology

In the process of practical application of satellite positioning technology, it is usually used to complete the exploration of geological and mineral resources and to fully detect the 3D coordinate data, then in the combination of the corresponding data to build the corresponding sensing system, improve the accuracy of data detection, and then in the combination of sensing system to continuously improve the accuracy of detection, reduce the occurrence of errors^[4]. In the process of applying this kind of technology, we should make use of the spectral characteristics to analyze, and analyze the characteristics of different mineral resources to do the radiation analysis.

3.5 Low Frequency Electromagnetic Method

In recent years, with the increasing rate of mineral consumption in our society, the demand for mineral resources and energy has been further expanded, and the development of mineral resources has become increasingly difficult due to resource constraints, if we still use the traditional way of mineral resources, exploration will be difficult to meet the current market development of the relevant requirements. Therefore, the corresponding technical personnel should use low-frequency electromagnetic method for investigation. At present, this technology is mainly applied to the mining area with higher technical coefficient of exploration difficulty.

3.6 X-Ray Fluorescence Technology

X-ray fluorescence technology is mainly used in the exploration of metallic mineral resources. This is because X-rays are sensitive to metals and can easily detect the layers and structures of metals underground, it can effectively collect relevant data, and at the same time, it can also carry out quantitative and qualitative analysis of this kind of mineral resources. Its operation is also relatively simple, the technical cost of the input is relatively low.

4. Problems in Exploration of Geological and Mineral Resources

4.1 Geological and Mineral Resources Exploration Technology is Not Advanced Enough

Our country is vast in territory, rich in mineral resources, with a huge potential for mineral development. Since the beginning of reform and opening-up, China's social and economic development has become more and more rapid, and the economic level has steadily increased, and the development of social and economic needs adequate mineral resources as security support, as the exploration technology of geological and mineral resources in China is still relatively backward, it is difficult to meet the needs of social development. According to the relevant investigations, it can be seen that at present, China's geological resources exploration technology is still generally carried out by means of manual exploration, and no advanced technology is used for exploration. In addition, the relevant equipment used is not very advanced, and therefore can not achieve a satisfactory survey results, accuracy is not high, and, because our country's topography is high in the west and low in the east, therefore, various geographical constraints and disturbances will also affect the accuracy of China's geological and mineral resources exploration, resulting in the phenomenon of exploration errors, making it difficult for follow-up exploration projects to be carried out better, finally, it is difficult to achieve a more satisfactory result in the follow-up survey.

4.2 The system of exploration work is not perfect

At present, there are many geological and mineral resources exploration units and enterprises in our country, but there are great differences in the division of labor, that is, there are still great differences in the focus, there are still some defects in the investigation content and the distribution of technical data. Due to the lack of a reasonable division of labor, the survey work has led to a lot of work based on insufficient, so it will lead to a great difference in the content of work error.

Relevant work has not been carried out in conjunction with the actual situation to carry out. Generally speaking, the work efficiency of geological and mineral resources exploration in China is backward at present, and the exploitation of resources and energy can not meet the corresponding demands of the current market development^[3].

4.3 The Reserve of Technical Personnel for Geological and Mineral Resources Exploration is Insufficient

As we all know, the progress of technology is inseparable from the talent as the main foundation. From the current timely development of geological survey in China, the current professional and technical personnel are relatively scarce. This will undoubtedly greatly restrict and affect the continuous development of geological and mineral resources exploration technology in China. Generally speaking, it is mainly divided into two different contents, one is the training of school talents, and the other is the training of social enterprises. The former is due to the limited investment in educational resources, practical ability and educational equipment, which restricts the talent training and makes many college students transform theoretical knowledge into practical experience in learning. The latter is the social enterprise due to limited capital, backward talent management mode and training mode. The problems existing in both talent training directly affect the efficiency and quality of talent training, which leads to the phenomenon of insufficient talent reserve of geological and mineral resources exploration technology in China.

5. Problems and Countermeasures in Geological and Mineral Resources Exploration

5.1 We Should Continue to Learn More Advanced Exploration Techniques

From the perspective of historical development, the accuracy and level of geological and mineral resources exploration directly determine the social productive capacity and people's quality of life. If we do not solve the current problems in China's geological and mineral resources exploration, then it will obviously hinder China's socioeconomic development and become a major obstacle to economic development. Therefore, we must solve the corresponding problems in geological exploration in our country in time and work out reasonable countermeasures and plans according to the actual needs. The reason is that the current level of geological and mineral resources exploration technology in China is still relatively backward, the use of exploration technology is artificial-based. GPS RTK can be combined with dynamic satellites for geological Environmental monitoring, high-precision surveys, rapid digital conversion, and acquisition of primary source and information. In addition, the use of remote sensing technology can be used to achieve rapid exploration, complete the distribution of mineral resources, high-precision analysis, while ensuring the accuracy of data can be significantly reduced human resources and the corresponding cost of work, it can maximize a series of problems existing in the process of house resource exploration. At present, this technology is widely used in our country, but it is still being explored in our country. Relatively speaking, there are relatively few people who can flexibly use this technology, it is necessary for the research and Development Department of geological exploration of our country to strengthen and enlarge the research on this, and new technology and application scheme should be developed in time.

5.2 The Working System Should Be Redesigned

Under the new development environment, we should work out the working system of different reprogramming of mineral resources types, data and contents according to the actual situation, and promote the continuous development of this work, for example, classifying different types of mineral exploration, by the relevant departments to focus on support, clear the responsibilities of different departments, improve the efficiency and quality of investigation work, improve the work system and management content. In view of the fact that the present system of our country's investigation work is still rather old-fashioned, and because the system management is still not sound enough, therefore, the investigation management system should be further improved, to

strengthen the management of the investigation process and standardize the application methods of investigation techniques, in particular, to determine specific exploration models, to require all exploration units or enterprises to carry out geological and mineral resources exploration in accordance with relevant technical plans or requirements, so as to improve the efficiency of exploration, and at the same time to promote the continuous development of China's geological and mineral exploration undertakings, to achieve technological breakthroughs and innovation, and to provide greater technical security for social and economic development.

5.3 Schools and Social Enterprises Should Strengthen Personnel Training

At present, the technical personnel of geological exploration in our country are generally scarce, and at the same time, they often encounter many unexpected problems in the process of geological and mineral resources exploration, such as: by the complex address layer structure of interference and impact, which requires the relevant technical personnel with strong technical expertise and rich practical experience, keen insight, this paper analyzes and discusses the problems in the exploration, then puts forward some feasible countermeasures according to the different actual conditions, and instructs the related personnel to complete the geological and mineral resources exploration work in time, to obtain the most true and accurate data, complete the exploration work, provide more technical support for the subsequent mineral resources development work, ensure that the whole project can be better run. Judging from the current situation of the construction and development of geological prospecting teams in our country, there is still a need for a group of technicians to conduct technical research and guide work, a feasible solution is put forward according to the corresponding problems existing in the exploration of geological and mineral resources. In view of the above-mentioned related issues, this article believes that schools and enterprises are not only existing individuals, but also exist in an interconnected whole, and schools can play a great role in training talents, enterprises should break the communication gap between them and strengthen the cooperation and exchange between them. Enterprise experts should come to school regularly to give professional lectures and hand-on work experience, to help students better understand the professional knowledge, so that students from a single spiritual understanding to a deeper understanding of the application of knowledge, change the original single learning model, which compared with the past, we can deepen and relearn our major, strengthen our understanding of the structure and system of professional knowledge, grasp more trends and trends of professional development, and prepare for future employment. In addition, the school should regularly arrange for the school to participate in the investigation and work of the enterprise, so that the students can have more understanding and understanding of the geological and mineral resources exploration, and can come into closer contact with the work site, contribute to the completion of knowledge transfer and transformation^[4].

6. Conclusion

To sum up, at present, the problems faced by the development of the geological and mineral resources exploration industry in our country are still very severe. The most important one is that the investment of the enterprises in our country is relatively small, in addition, the technology is backward and the talent training model is not up to standard, which leads to the slow development of the geological and mineral resources exploration industry in China, hinders the development and progress of the industry. Under the new developing situation and the background of social transformation in our country, we should strengthen the support and analysis to the geological and mineral resources exploration industry, promote its rapid progress and development, and constantly optimize the management system, at the same time pay attention to the industry development and enterprise development, personnel training support, in order to promote the continuous development of China's geological and Mineral Resources Exploration, technology innovation and breakthrough, to promote the development of this industry to lay a solid good foundation.

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