

Problems and Countermeasures of Groundwater in Hydrogeological Survey

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Abstract: This paper makes a special analysis on the main technical work, tasks and contents of investigation and survey by using hydrogeology, combined with the common technical problems of surface water and groundwater utilization in investigation and survey by using hydrogeology. These problems mainly include the decline and rise of aboveground water level, the rise and fall of underground phreatic water level Irregular fluctuation of water level and variation of confined water in aboveground rivers.

Keywords: Hydrogeological Survey; Groundwater Level; Survey System; Physical and Chemical Properties

Introduction

Groundwater engineering is an important part of geology, rock and soil mass. Doing well in these two aspects of geological investigation and survey can effectively and fully ensure the overall geological and geotechnical engineering quality. Groundwater pollution is unfavorable to the stability of the construction of exploration projects. When carrying out engineering exploration and exploration, we should fully combine the actual progress of exploration projects, do a good job in the analysis of pollution related causes and comprehensive treatment measures, and deeply investigate and explore the causes of groundwater pollution, so as to ensure the smooth and safe development of the project.

1. Main work of hydrogeological survey

In carrying out hydrogeological and meteorological survey, the main survey links are as follows: First and foremost, analyze the foundation stability of bedrock mountain area. Combined with the long-term management experience of large-scale geological and natural disasters in the past, it can be seen that many large-scale geological disasters are related to the poor stability of bedrock foundation in mountainous areas. The main gravelly soil layer and other sandy soil layers are the soil layers with relatively rich groundwater. This part of bedrock soil layer has strong rainwater permeability. During the field survey, we need to focus on the parameters of main bedrock soil layer, such as the thickness of main bedrock soil layer, bedrock lithology, integrity of bedrock structure, etc. What's more, the investigation of groundwater source water level is a key content to be paid attention to during the operation investigation, including the change law of groundwater source water level and whether it has a direct impact on the soil stability of the investigated soil layer, which is related to the production safety during the construction operation of the whole survey area, and is one of the very important contents of operation investigation.

2 Analysis of common problems of groundwater in hydrogeological survey

2.1 Groundwater level rise

The rapid change of groundwater table is directly related to the change of local grass-roots precipitation. The rapid rise of groundwater table and the rapid emergence of adverse problems may have a great macro negative impact on the geological conditions in the whole region. The specific reasons are as follows: first, the rapid rise of underground water may directly

damage the base foundation of buildings in this area, increasing the water content of the base foundation. Second, during the upward movement of the base layer phreatic position, it will produce large squeezing force and pressure on the surrounding base soil layer structure, and the soil structure will gradually become loose under the action of squeezing force and pressure field, which would reduce the overall foundation support power of the surrounding soil layer and affects and reduces the structural stability of high-rise buildings.

2.2 Irregular fluctuation of groundwater level

Among the main reasons for the irregular fluctuation of groundwater level, climate change often accounts for a large proportion. This fluctuation will directly affect the physical and chemical infrastructure of the surrounding building soil. Under the action of soil replacement agent, it will gradually change the original physical and chemical structure properties of the surrounding soil layer structure, and gradually reduce the original soil bearing capacity of the surrounding building soil layer.

3 Analysis of countermeasures for groundwater problems

3.1 Clarify the contents of groundwater investigation

In the specific engineering survey and design work, the data to be collected in time generally include the type of groundwater joint, the depth of groundwater joint, the joint material of drainage layer, the development process of plants with drainage layer joint, the average water level of groundwater, the quality of groundwater, soil and water, etc. In addition to observing the appearing influencing factors of groundwater in the reservoir area, it is also very necessary to conduct in-depth research on important factors such as the extension and utilization of the route of groundwater resources in the reservoir area, precipitation formation conditions in the region and supplementary precipitation ways so as to improve the objective integrity of precipitation collection data analysis.

3.2 Strengthen the detailed investigation of groundwater

By continuously strengthening the detailed geological survey of urban groundwater, a large number of more accurate geological data analysis information can be obtained in time to improve the objective accuracy of geological evaluation and analysis results. The geological and geotechnical system and structure in the area where groundwater resources are located have strong geological and hydraulic erosion properties, which often has a great negative geographical impact on the smooth development of urban groundwater geological survey. Therefore, when in its early stage to carry out geological survey, it is necessary to regularly analyze and study the physical and chemical structure properties of deep-water rock and soil mass. The properties of easy water storage and drainage on the surface of deep-water rock and soil mass urges us to conduct more in-depth analysis and research. The geological contents requiring preliminary investigation, which require us to analyze and refine them, collect the geotechnical geological deformation changes in different geological areas, and comprehensively analyze the basic geological conditions of groundwater areas in the early stage based on the data, improve the reliability and effectiveness of early groundwater geological analysis results.

3.3 Improve groundwater survey system

By establishing and improving the national groundwater geological survey system, we can greatly improve the solidation and order of the underground survey work and reduce the rework of the project. At present, in order to improve the quality standard of the whole operation survey process continuously, many operation survey units always formulate a set of corresponding operation survey update system. However, the relatively slow speed of updating of survey data will directly lead to strong technical lag in the construction of survey system. In the whole process of survey system implementation, we should also do a good job in timely collection and management of users' feedback on the survey information, extract effective feedback information, selective information supplement, etc., improve the authenticity and humanization of the implementation content of the survey system amid survey management system. In the whole process of the relevant system measures implementation, it is necessary to properly ensure that the relevant system contents are in a state of continuous

updating, so that the contents can fully meet the relevant building standards of the national building quality code system, and improve the applicability of the system contents.

3.4 Optimize hydrogeological assessment system

By establishing and optimizing China's hydrogeological risk assessment and monitoring system, we can fully clarify the potential geological threats that may exist in the process of resource development and utilization and deal with relevant problems in time, ensure the relative stability of hydrogeological monitoring in the administrative region. Depending on the needs of modern big data computing technology and mobile Internet computing technology, we can establish a hydrogeological resource evaluation and calculation system, which requires timely setting of reasonable geological evaluation and calculation indicators, such as determining the regional depth of groundwater resources, geotechnical structure properties, climate change conditions, etc. Based on a large number of data analysis and calculation results, the weight of the location of these main reference evaluation indicators in the region can be determined and directly brought into the process of evaluation and calculation results. The calculation results need to be comprehensively sorted to clarify the main occurrence degree and order of hydrogeological natural disasters in the current administrative area and the comprehensive treatment order of geological problems, so as to ensure the orderly and smooth progress of the evaluation work and improve the accuracy and reliability of the current hydrogeological evaluation and calculation results. The evaluation index and evaluation weight mechanism in the construction of evaluation management system need to be reasonably adjusted in time in combination with the actual market situation, so as to improve the accuracy and reliability of enterprise analysis and evaluation results and the practical value of enterprise evaluation management system.

4. Conclusion

To sum up, clarifying the contents of geological survey and monitoring of surface water and groundwater can effectively and fully improve the accuracy and integrity of geological survey and the credit of monitoring results, strengthen the current detailed geological survey of groundwater, and attain more accuracy of the geological data analysis information. Improving the current groundwater geological survey and monitoring system can effectively improve the solidation and order of geological survey of monitoring staff in the monitoring process, optimize the current hydrogeological survey, evaluation and monitoring system, fully clarify the potential security threats that may exist in the survey process of current agricultural development, and pay attention to the current groundwater geological survey and monitoring problems, discover the possible prominent problems in the current hydrogeological survey and monitoring work timely, and improve the working ability of geological survey and monitoring personnel, so as to give full play to the practical application value of geological survey and monitoring instruments. We should formulate various corresponding collection and treatment to improve the processing applicability and effectiveness of the required collection and analysis data base on some problems that may exist in the current groundwater resources survey, which is of positive guiding significance for the continuously improvement of the strategy and practicability of the sewage treatment method.

References

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