International Journal of New Developments in Engineering and Society
ISSN 2522-3488 Vol. 4, Issue 2: 97-101, DOI: 10.25236/IJNDES.040219

Construction and Application of Groundwater Pollution Prevention and Control Zoning System

Jiangtao Zhao

School of Civil and Environmental Engineering, Jincheng College of Sichuan University, Sichuan Chengdu 611731, China

ABSTRACT. *With the rapid development of China's economy, the development rate of groundwater resources is increasing year by year, and the problem of groundwater pollution is a serious problem that affects the comprehensive utilization of groundwater resources in China. The division of groundwater pollution prevention and control is a very effective measure to protect groundwater resources and improve the utilization rate of groundwater, and it is also a geological survey and evaluation work of groundwater pollution It is an important branch. It can not only be an important guarantee for the implementation of groundwater pollution prevention planning, but also effectively prevent groundwater pollution, reduce the risk of groundwater pollution, and improve its safe utilization rate. Therefore, how to better carry out the prevention and control of groundwater pollution zoning has attracted the attention of many scholars. The construction of groundwater pollution prevention and control zoning system plays an important role in groundwater pollution prevention and control planning. In this paper, the author explores the construction of groundwater pollution prevention and control zoning system. This paper analyzes the construction method of reasonable prevention and control of groundwater pollution zoning based on the problems of groundwater pollution prevention and zoning system, groundwater pollution sources, social and economic conditions.*

KEYWORDS: *Groundwater pollution, Prevention and control division, Construction method, Rationality analysis*

1. Introduction

As an important source of water supply for urban and rural areas, groundwater plays an irreplaceable role in maintaining the healthy development of economy and society. According to statistics, groundwater resources account for nearly 20% of China's total water supply, which is an important strategic resource to support sustainable economic and social development. Groundwater is the source of drinking water for 60% of the population. With the development of social economy in our country, the pressure of groundwater environment is increasing gradually, and

ISSN 2522-3488 Vol. 4, Issue 2: 97-101, DOI: 10.25236/IJNDES.040219

the problem of groundwater pollution is becoming more and more prominent. At present, the foundation of groundwater environment management in China is quite weak, the basic environment of groundwater is not clear, the construction of relevant laws and regulations and standards lags behind, and the water environment supervision system is not perfect, which has a serious impact on China's economic and social development, drinking water security, and restricts the coordinated development of China's economy, society and environment. Compared with the surface water, the pollution of groundwater is hidden and persistent, which is more difficult to detect, and the treatment is very difficult and requires a lot of cost. Up to 2005, 24.95% of the area of groundwater in plain area of our country has been polluted in different degrees. In 195 cities, 97% of them are polluted by groundwater, 40% of them are seriously polluted. In order to utilize groundwater resources effectively in a long term, it is necessary to manage and protect groundwater environment carefully.

2. Research Status of Groundwater Pollution Prevention and Control Zoning System

Through investigation, it is found that there are still many single research projects on groundwater in China, but there are few comprehensive researches. The single research work is mainly divided into groundwater vulnerability, groundwater value research, groundwater source protection and so on. Generally, this single research only focuses on the single aspect of water pollution, such as groundwater vulnerability research, which only focuses on the research area The vulnerability of groundwater sources in the region is studied, while the research on groundwater sources focuses on the quantitative description of the hazards of groundwater pollution caused by human activities, while the comprehensive research is aimed at multiple aspects of groundwater sources, which has a lot of positive significance for the planning of the whole groundwater pollution control area. Groundwater pollution prevention and control zoning system is committed to the comprehensive study of the above issues, which needs to be analyzed from the aspects of political economy, social culture and groundwater. This comprehensive study can be based on the results of various individual studies, and provide a basis for the comprehensive treatment of groundwater [1].

3. System Construction of Groundwater Pollution Control Area

The design of the water pollution prevention and control zoning map is the basis of the whole work. The distinctive design can improve the efficiency of the zoning map. The zoning map is divided into three levels, namely, the primary level, the intermediate level and the senior level. The primary level is composed of the hazards of surface pollution sources, the inherent vulnerability of groundwater, the water richness of aquifer and the water quality of groundwater. The intermediate level includes the risk of groundwater pollution and the protection of groundwater sources Protection area, groundwater value and other aspects, the high-level layer is the

ISSN 2522-3488 Vol. 4, Issue 2: 97-101, DOI: 10.25236/IJNDES.040219

target layer, is the prevention and control zone layer of groundwater source. The following are specific analysis from several aspects:

3.1 Risk of Groundwater Pollution

Groundwater pollution is a phenomenon caused by the interaction of surface pollution sources and aquifers. The risk assessment of groundwater pollution should be based on the surface pollution sources included in the study area and their own water quality. Classification of groundwater pollution sources is a very common way of pollution source evaluation. As early as 1960, some scholars studied groundwater assessment. However, due to the variety, nature, distribution and other aspects of pollution sources, it is not perfect to carry out a single project only for a wide range of assessment work, and only the hierarchical assessment system can carry out a comprehensive assessment of groundwater pollution sources. This kind of classification assessment of groundwater sources came into being around 1970. To a large extent, this assessment method is affected by the scale of groundwater pollution risk sources of different categories, the information needed for the assessment work, the types of pollution sources and other factors. The variability of these factors brings difficulties to the classification of groundwater pollution sources of different quality. According to previous experience, groundwater pollution The risk source evaluation is mainly qualitative or semi quantitative method, which is greatly influenced by human beings and does not have great generality. Therefore, this study uses the quantitative analysis evaluation method, this method carries on the quantitative analysis to the groundwater pollution source characteristic pollutant and its corresponding discharge quantity, calculates its pollution source harm grade through the specific formula, and carries on the pollution source division based on this [2-3].

3.2 Groundwater Value

Groundwater value is a parameter to evaluate the use of groundwater in political and economic aspects, and the data shows that groundwater value is a very important guarantee for the division of groundwater sources. Although there is no specific quantitative representation method so far, it is undeniable that the use of imprecise means to evaluate groundwater value is also conducive to helping relevant Workers make corresponding division decisions to affect water quality. Groundwater value includes in-situ value and exploitation value, among which exploitation value refers to the value of groundwater used in industrial and agricultural production, while in-situ value refers to the buffer capacity of aquifer to the periodic groundwater exploitation activities, such as geological disasters, pollution source diffusion and other ecological crises are caused by this buffer capacity. Specifically, the value of groundwater is mainly reflected in two aspects: the water yield of aquifer and the water quality of groundwater. This investigation and study is based on these two aspects to analyze and distinguish different groundwater sources through different water quality [4-5].

ISSN 2522-3488 Vol. 4, Issue 2: 97-101, DOI: 10.25236/IJNDES.040219

3.3 Underground Water Source Protection

The protection of groundwater source is a key measure to protect groundwater source. In the regionalization system of groundwater pollution prevention and control, this measure can well reflect the current management situation. The division of groundwater source protection zone improves the quality of water source to a great extent. Through investigation, it can be found that the level of the regionalization system with groundwater source protection zone is higher than that without groundwater The system of lower water source protection are [6-8].

4. Conclusion

The construction of the regionalization system of groundwater pollution prevention and control should be considered comprehensively from the aspects of the nature of pollution caused by the pollution source itself, the resistance of aquifer itself to pollution, the social and economic aspects of groundwater itself, and the policies and regulations formulated and implemented at this stage The risk assessment of groundwater pollution, groundwater value and the division of groundwater source protection area are the quantitative representation of the above three levels. In the process of system construction, with the help of GIS technology, the weight is determined by analytic hierarchy process and the corresponding superposition principle plays an important role in the coupling of constituent elements The application of this system in Beijing plain area shows that the results of district classification can comprehensively reflect the research results of Beijing plain area groundwater in the above-mentioned essential level, social and economic level and policy level, which is in line with the actual situation, and can play a guiding role in the next step of actual prevention and supervision measures formulation and implementation In addition, because of the dynamic characteristics of the constituent elements, it is of great significance to carry out the sensitivity analysis of the constituent elements and determine the renewal frequency of the division according to the actual situation for the improvement and promotion of the system. In a word, the prevention and control of groundwater pollution is very important to the exploitation and utilization of groundwater resources, which should be paid great attention to by relevant departments and lay a solid foundation for improving the utilization rate of water resources in China as a whole.

Acknowledgement

Si Chuan center for rural development research-Evaluation of the current situation of rural water pollution in sichuan province and its prevention and control measures (CR19020).

References

ISSN 2522-3488 Vol. 4, Issue 2: 97-101, DOI: 10.25236/IJNDES.040219

[1] Yang Zi (2018). Study on the construction of groundwater pollution prevention and control zoning system [J]. Environment and development, vol. 30, no. 2, pp. 69-70.
[2] Wang Junjie, he Jiangtao, Lu Yan, et al (2012). Study on the construction of groundwater pollution prevention and control zoning system [J]. Environmental science, vol. 33, no. 9, pp. 3110-3116.
[3] Jingliuxin, Wang Dong, sun Hongliang, et al (2016). Considerations on the construction of groundwater pollution prevention and control system in Beijing Tianjin Hebei region [J]. Environmental protection, vol. 44, no. 9, pp. 47-50.
[4] Liu Bing (2013). Preliminary study on the construction of groundwater pollution prevention and control zoning system in Tieling City [J]. Environmental protection and circular economy, vol. 33, no. 8, pp. 52-54, 57.
[5] Yang Lei, Huang Jingjun, Lu xurong (2014). Regionalization of groundwater pollution control [J]. Journal of geology, vol. 38, no. 2, pp. 298-301.
[6] South Asia forest, fan Yisong, Zhen Pingfu (2018). Study on groundwater pollution and protection in Yulin [J]. Groundwater, vol. 40, no. 4, pp. 91-95.
[7] Zhang Li, Huang Jingjun, Miao Shixian (2015). Summary of main research results of geological environment survey and zoning in Jiangsu Province [J]. China Geological Survey, vol. 2, no. 4, pp. 62-69, 70.
[8] Zhao Peng, he Jiangtao, Wang Manli, et al (2017). Comparative analysis of quantitative methods of pollution source load in groundwater pollution risk assessment [J]. Environmental science, vol. 38, no. 7, pp. 2754-2762.