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Determination of "Double Control" Management Threshold Value for Groundwater Based on GMS -- A Case Study of Changchun City, Jilin Province

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Groundwater is an essential controlling factor for economic and social development, human survival and good ecological environment. Many areas use groundwater as a regular source of water. However, with the development of economy and society, water pollution problems keep emerging, water resources crisis is increasingly serious, especially in the northern water resources shortage areas, so groundwater management is particularly important. It is no longer possible to objectively reflect the groundwater safety situation in a certain area by controlling the amount of groundwater mining or the groundwater level. Therefore, it is necessary to construct the groundwater "dual-control" management mode. However, the foundation of "dual-control" management is to establish the mathematical relationship between the groundwater control level and the amount of groundwater mining. Taking Changchun city in Jilin province as an example, the study area was divided into different management zones, and the threshold value about the groundwater level and the amount of groundwater mining were determined by analytical method. Then using GMS software to establish a model of groundwater resources in the study area. After identification authentication model to simulate the groundwater resources and the relationship between the groundwater table, ultimately determine the threshold value of groundwater level and water quantity under dual control management in this area. It can be used as the most intuitive data of groundwater dual control management and control. With the groundwater protection as the starting point and the sustainable utilization of resources as the goal, it will be the focus of future research in China to establish the groundwater management mode of "water level" and "water quantity", in order to make the groundwater management more flexible,

controllable and scientific.