



Use of long-term monitoring data of groundwater's level for numerical range forecasts of hydro-geological conditions change under the influence of economic activities

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We consider a possibility of hydrodynamic forecasts production using numerical modeling on the basis of the maps of extreme maximum and minimum levels of ground waters. These maps are made on the basis of single observations received at engineering researches during construction. The geological information for the last years is also widely used. Regime observations on building sites aren't obligatory at use of the given technique as time series of ground waters heads on a basic of state network of hydro-geological monitoring are considered in calculations.

According to the Russian standard documents at designing a possibility of change of hydro-geological conditions on the site in the course of construction and operation of buildings should be considered.

One of principal causes of the given changes is natural seasonal and long-term fluctuations of ground water's level. Natural fluctuations are complicated by the time variability caused by factors of urbanization in city.

The different time data about geological conditions and ground water's level position is used at construction of hydrodynamic models of ground water. It is incorrect to use this data without recalculation it by uniform time. It is also necessary to note an absence of good methodical base for manufacture of long-term hydro-geological forecasts of satisfactory accuracy.

The most convenient and informative way of data presentation about hydro-geological conditions changes is the estimation of extreme maximum and minimum possible levels of ground water and also a position of the level received at researches in this range. Extreme levels are made by calculation in which the data of single observations in concrete wells is a necessary component. Maps of hydroisohypsies for extreme positions of level in the given territory are constructed on the basis of the processed data. Use of this data as initial at hydro-geological models making allows to estimate influence of a projected construction on ground water in the greatest possible range.

This method gives priority in comparison to the decision of a non-stationary filtration task as complexities with an estimation of accuracy and reliability of the received forecasts are difficultly surmountable in this case. Especially it concerns the urbanized territories characterized by the broken ground water's regime. The range estimation allows to consider all possible changes of environment at various positions of ground water level. It also gives good base for the further construction of more exact forecasts in case of increased requirements to accuracy.

The technique has been applied for the prediction of the hydrogeological conditions in the construction of the 3,5 km automobile tunnel in Moscow.