

QUALITY AND ECOLOGICAL STATE OF GROUND WATER

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Ground water is widely utilized in the national economy of Ukraine and represents an important reserve in terms of the economic and social development of the country, and the stabilization of its economic situation. The southern oblasts of Ukraine have limited ground water resources. Deterioration of the ecological-hydrogeological situation in the southern part of Ukraine prevents the standard use and protection of ground water, and has in a number of regions resulted in contamination and exhaustion of water resources. Ground water is utilized in different regions of Ukraine for various purposes. In 11 oblasts out of 25, ground waters provide more than 50% of potable water demand.

Ground waters account for nearly the entire water supply in such oblast centres as Lugansk, Lviv, Poltava and Khmelnytskyi. In Ternopil, Kherson and Chernivtsi, ground waters account for more than 50% of the water supply. Many towns and villages (Glukhiv, Kovel, Mirgorod, Nizhin, Novololynsk, Sarny and others) in the southern and western oblasts of Ukraine fully depend on ground waters for their water supply. High population density and the focus of industrial and agricultural production on wasteful technologies requiring large amounts of water have conditioned a considerable technogenic impact on the environment of Ukraine, including the water environment. This impact is 10-15 times higher in Ukraine than in the neighbouring countries. Limited and uneven location of water resources in the territory of the country makes the problem of stable water supply with minimal ecological and economic losses extremely crucial.

Scales and rates of changes in the ecogeological state of ground waters are particularly important in highly populated regions with an intensive economical activity. A large number of water intake systems in these territories work under conditions harmful to the natural regime. This is conditioned by a correlation of replenishment and consumption of ground waters under the impact of technogenic factors, which has resulted in a depletion of ground water resources, with the creation of large depression funnels as a result of intensive water intake and a lowering of the water level in the openings, penetration of salted waters through intensive pumping out of ground water, hydrostatic head of ground water related to hydraulic-engineering construction, flooding of the territories under the influence of natural technogenic factors, and increased or decreased levels in the reclamation systems. Deterioration of the ground water quality as a result of local contamination related to technogenic loads on aquifers (depression formation, intrusion of contaminated waters) and almost total contamination of landscapes and surface waters (entry of chemical substances into arable land, radionuclides, etc.) are some of the most pressing ecological problems.

The chemical contamination of high toxicity caused by the sewage waters of industrial enterprises poses another danger to the environment. Ion forms of such microelements as mercury, manganese, copper, lead, zinc and chromium are most hazardous for human health. The impact of economic activity on the hydrosphere of Ukraine differs from region to region. In the north-western oblasts of Ukraine contaminating substances in the ground waters occur mainly within limits of permissible concentrations, and their composition correspond to the standard 2874-82 "Potable water". Ground waters with a moderate level of contamination characterized by a small excess of contaminating components are scattered around Ukraine in an island pattern with a larger concentration in the north and the east. A dangerous level of contamination of ground waters is characterized by a high content of noxious substances and is attributed to a considerable technogenic impact on the geological environment, including ground waters in the south and east of Ukraine. A high level of contamination characterizes ground waters in the highly populated and industrially developed regions, such as Donbas, the Dnieper area, and the Crimea. Noxious elements several times exceed permissible levels, and water does not correspond to the standard 2874-82 "Potable water".

Summing up, the present situation with regard to ground water in Ukraine is satisfactory in most of the territory, with local exposure of technogenic impacts. However, there is a tendency of a correlated process of contamination of landscapes, and surface and ground waters in industrial, urban, agricultural and mining regions, which is a proof of an excessive technogenic load on the environment, thus deteriorating the most protected water systems, the aquifers, which are the last ecological reserve of human water supply.