

GEOACTIVE ZONES – THE MAIN OBJECT OF ENGINEERING-GEOLOGICAL ASSESSMENT OF TERRITORIES

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In the present period, many geological Sciences, including - Engineering Geology, in connection with the transition to a new geological paradigm – lithospheric plate tectonics, revise their theoretical and methodological foundations, which consider aspects related to the analysis and modeling of geodynamic conditions, the formation of natural and man-made geological systems. Trofimov V.T. (2010) [8] formulated the idea of the need for a new stage in the development of engineering Geology, in which the full global diversity of all objects of engineering Geology should be investigated, the problems of this science arising from the paradigm of plate tectonics are considered and draws attention to the need for engineering-geological analysis of various intraplate phenomena – planetary fractures, deep faults, ring structures, etc., known in geotectonics and geodynamics, but which are poorly linked to the solution of engineering-geological problems.

A powerful factor in the formation of engineering-geological conditions of the territories, which often plays a major role among many natural factors are geodynamic active zones (or simply geoactive zones – areas of the earth's crust, active at the present stage of neotectonic development, characterized by reduced strength of the crust, increased fracture, permeability, and, as a consequence, manifestations of discontinuous tectonics, seismicity and other processes, including – engineering-geological, geoecological, hydrogeological) [4, 6]. Special techniques developed by the author and others for evaluation of geodynamic (neotectonic) activity of territories-morphoneotectonic, lineament-geodynamic and landscape-geodynamic analyses on the basis of aerospace-geological researches [2, 5, 7] allow to establish quite reliably geoactive zones of different levels – from regional (with areas of hundreds and thousands of km²) to local (with areas less than 1 km²), especially when combined with other methods. This technique has been used in many regions – the Volga-Urals, Priurals, Eastern and Western Siberia, the far East, North, Central Asia for engineering and geological purposes (engineering-geological mapping and zoning, engineering surveys for civil and industrial construction, design of engineering structures, justification of geological safety of mines, development of master plans of cities and schemes of territorial planning, etc.). Numerous geoactive zones with different degrees of activity are distinguished. Within the zones with the highest activity and high density of lineaments there is a widespread manifestation of engineering-geological processes - ravine formation, landslides, coastal and slope erosion, etc.). In areas with the development of

permafrost within these zones, there is an increase in the size of talikov among frozen rocks; deterioration of physical and mechanical properties of soils (increase in the area and power of loose soils-peat, soft and fluidized loam, water-saturated Sands, increased fracturing of rocky soils); increasing the intensity of the manifestation of engineering-geological processes (especially – waterlogging, soil heaving, thermokarst, erosion processes), which are generally characterized by a less favorable degree of complexity of engineering-geological conditions [2]. In the karst regions there is a clear pattern of increasing the strengthening of karst-suffusion processes in geoactive zones [1]. In the conditions of technogenesis in urban areas (cities, various construction sites, mining, reservoirs, etc.), the intensity of engineering-geological processes and deterioration of soil quality increases even more [3]. Numerous facts testify to the direct influence of geodynamic activity on the engineering-geological conditions of the territories of different degrees of development, which characterizes the engineering-geological role of geoactive zones as very significant. This makes it necessary to consider them as one of the main factors in the formation of conditions and basic criteria for engineering-geological assessment and zoning.

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