Materials of Conferences

GEODYNAMIC AND TECHNOGENIC PROCESSES IN THE AREAS OF OIL AND GAS PRODUCTION AND THEIR ECOLOGICAL CONSEQUENCES

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The assessment of an ecological condition of environment of oil-and-gas territories is one of the major tasks at their development, for the purpose of safe development and carrying out policy of rational environmental management. Perm Krai is the large oil-and-gas region (area of 160,3 thousand sq.km) where within the Volga-Ural oil-bearing region, openly more than 220 oil fields and gas from which about 120 it is developed, many of them are exploited over 40 years, some are already developed. Searches of new fields are intensively carried out, in the territory more than 20 thousand deep and structural wells are drilled, tens of thousands of kilometers of geophysical profiles are passed. About 10 thousand main oil and gas pipelines on which quite often there are emergencies to ecological consequences are operated. On oil fields of Perm Krai pays attention the following types of change of environment: relief re-planning, deforestation, violation of a soil and vegetable cover, change of conditions of a superficial drain and infiltration in connection with construction of drilling platforms, laying of communications, constructions of settlers for boring solutions and industrial drains. Impact on the geological environment is shown in the following: pollution of fresh underground waters by oil products at the expense of leakages of oil from barns, oil pipelines at accidents, the trade equipment at violation of production schedules; pollution of underground waters by chlorides at breaks of deep brines through defective wells and hydrodynamic gaps; impoverishment of deep brines by pumped fresh waters; radio nuclide pollution of a subsoil (breeds and brines) as a result of the underground nuclear explosions which have been carried out for an intensification of oil production. Feature oil-extracting technogenesis is considerable depth (to 2–3 km) coverage of the geological environment by technogenic loadings and wide scales of negative impact on environment. In regions of oil fields more than 70 centers of pollution of underground waters with an area up to 100 sq. km are revealed. Difficult nature of pollution is shown at an arrangement of oil fields in a coastal zone of large reservoirs. The significant role is played by the geological factors caused by geodynamic, structural and tectonic, neotectonic processes. At investigation and development of gas and oil fields activization of a deep karst formation with formation of failures is observed. Especially strongly these processes are observed in geodynamic active zones with a high tectonic fracturing of breeds. The most significant environmental problem of oil-and-gas regions of Perm Krai is a liquidation of technogenic hydrodynamic systems in the top part of the geological section which manifestation in a zone of fresh underground waters is observed on many oil and gas fields.

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ECOLOGIC CONDITION OF COOLING WATER RESERVOIRS OF KRASNOYARSK REGION IN AN INITIAL PERIOD OF EXISTENCE

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An impact of biochemical factors over the formation of chemical composition of a reservoir is defined by processes of constant exchange of a substance and energy in biochemical natural circles. Processes of transforming substances in a reservoir are multidimensional: substances participate in processes of dissolution, electrolytic dissociation, complex-formation, catalytic transformations, absorption at the surface of non-organic, organic, and bio-organic materials, are consumed and discharged during processes of hydrobionts' metabolism.

Anthropogenic impact leads to significant alterations in chemical composition of a reservoir: chemical composition of atmospheric fallouts, undersoil and river waters changes. Mineralization of a reservoir water and concentration of polluting substances increases under a regulation of flow due to an increase in area of vapor and accumulation of substances. Plowing soils and cutting woods at the territory of rivers Beresh, Bazyr, Kadat alters correlation between surface and soil flows of the rivers.

We have revealed 14 factors that influence a reservoir ecosystem via the method of factor analysis of a statistic data row according to the quality of cooling reservoirs for a decade. The first of the outlined factors defines about 19 % of the total dispersion of the observed indexes, and the second