MONITORING OF BIOLOGICAL RESOURCES AND CRYOLITHOZONE IN THE TERRITORIES OF THE CENTRAL BLOCK OF THE TALAKANSKOYE OIL AND GAS CONDENSATE FIELD AND THE VOSTOCHNO-ALINSKY SUBSOIL PLOT OF "SURGUTNEFTEGAS" PJSC IN THE REPUBLIC OF SAKHA (YAKUTIA)

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REPORT

on the results of research work

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INTRODUCTION

The report presents the results of scientific monitoring at the Central Block of the Talakanskoye oil and gas condensate field and the Vostochno-Alinsky subsoil plot of "Surgutneftegas" PJSC in the Republic of Sakha (Yakutia). The survey was carried out from 29 July 2022 to 2 August 2022, once again in the scope of the corresponding work conducted in 2014 and 2017 (Report..., 2014, 2017). The field activities generally corresponded to those previously completed. The methods of work did not change. The monitoring was supplemented by an examination of sludge pits, and the study of hydrobiocenoses was amplified with hydrochemical studies.

CONCLUSION

None of the observed components of the ecosystem of the watershed area of the Lena-Vilyui interfluve within the Vostochno-Alinsky subsoil plot and the Central Block of the Talakanskoye oil and gas condensate field shows signs of negative dynamics in connection with the complex of works on the operation of the oil and gas condensate field. All noticeable changes are local in nature, and restoration processes can be observed.

No changes in soil properties and structure were recorded at the reference monitoring points of the natural landscape. The content of determined pollutants does not exceed permissible values, and all changes remain within the limits of determination error. The category of land pollution in terms of the content of the base active metals is acceptable. Over eight years, in morphological terms, the profile of the dump (anthropogenically transformed soil, section P-14) has gone through minor processes of restoration: the degree of penetration of the herbaceous plant roots has increased, organic matter is accumulating in the upper part of the profile – which corresponds to an organo-accumulative embryozem – 2 stages of technogenic soil transformation.

The surveyed watercourses are similar in chemical composition. Their waters have a neutral or slightly alkaline reaction. The oxygen regime is within normal limits. According to the composition of main ions, the waters are of the hydrocarbonate class, calcium group, type II-III, low-mineralized, very soft or soft. We detected a slight excess in easily oxidizable organic substances (1.0-1.4 MAC), color index (1.6-2.1 MPC), copper (1.5-3.0 MAC), difficult-to-oxidize organic substances (2.3-2.9 MAC), total iron (1.4-3.2 MAC) and manganese (1.4-3.6 MAC) in all examined water bodies. It is likely that the deviations are natural (caused by natural processes, such as leaching from ferromanganese, copper pyrite and other ores, decomposition of bottom sediments). The rest of the analyzed chemical components are characterized by concentrations that fall within the standard parameters. The composition and quantitative indicators of algae vary significantly from year to year. The saprobity index remains virtually unchanged. In July 2017, the diversity of algae in the water bodies at the Vostochno-Alinsky subsoil plot was two or more times higher than in 2022. Bacillariophyta are the most common types of phytoplankton; Ochrophyta and Cyanobacteria are the most abundant groups in terms of numbers; Charophyta and Bacillariophyta dominate in terms of biomass. The composition and quantitative indicators of algae change depending on transparency and fluctuations in water level, which is probably associated with fluctuations in the water content of watercourses. The stable state of the watercourses at the Talakanskoye oil and gas condensate field is evidenced by the presence of rare species of dragonflies, *Calopteryx japonica* and *Aeshna grandis*, associated with clean waters.

In the undisturbed natural biotopes of the study area (forests of various types, river valleys and river banks), the bird population typical of the taiga zone of the Lena Plateau is preserved. In the areas with fragments of anthropogenic landscapes at the Vostochno-Alinsky subsoil plot

and the Central Block of the Talakanskoye oil and gas condensate field, as a result of the increasing mosaic of biotopes, the species diversity and population density of birds is increasing slightly, and this trend is likely to continue. The combination of industrial development of the study area and secondary succession in disturbed areas may lead to a greater mosaic of biotopes and possibly to a slight increase in the diversity and number of birds.

The fauna of small mammals retains its typical composition and structure and does not undergo any changes. The northern red-backed vole (*Clethrionomys rutilus*) is dominant in forest biotopes (as elsewhere); the field vole (*Microtus agrestis*) and the tundra vole (*Microtus oeconomus*) are prevailing in open areas. The anthropogenic influence does not have any negative consequences. The increase in open spaces (power lines, glades, clearings, forest edges) and the emergence of a highly mosaic vegetation cover lead to the growth of species diversity: species that gravitate towards open spaces are becoming the typical forest (taiga) species. The analysis of the spatial distribution of tracks and sightings of hunting mammal species showed that the number of animals such as elk and brown bear is relatively high, the number of other species is stable.

The local populations of objects listed in the Red Book did not degrade. Moreover, rare and aesthetically valuable species of beetles (*Cetoniinae, Trichius fasciatus*) were found in the herbaceous-shrub plant communities located near flares. In 2022, *Asteia elegantula Zett* (Diptera, Asteiidae) was discovered here for the first time ever.