

Russian Federation
PUBLIC JOINT STOCK COMPANY
“SURGUTNEFTEGAS”



**Summary report
on results of industrial environmental monitoring
within license blocks of “Surgutneftegas” PJSC
in the territory of the Republic of Sakha (Yakutia)
in 2022**

Industrial environmental monitoring (IEM) in “Surgutneftegas” PJSC is performed on the basis of GOST R 56059-2014 “Industrial environmental monitoring. General provisions” to provide information on the environment condition and pollution level required to perform activity on preservation and restoration of the natural environment, rational use and reproduction of natural resources, prevention of the negative impact of business and other activity on the environment and elimination of its consequences.

According to GOST R 56059-2014 environmental analytical measurement can be performed only by in-house or third-party laboratories that are accredited for required measuring in compliance with the current legislation of the Russian Federation and have license to operate in the sphere of hydrometeorology and related areas.

“Surgutneftegas” PJSC has license No. L039-00117-77/00299159 dated 17.06.2022 to operate in the sphere of hydrometeorology and related areas, including determination of the pollution level of ambient air, soils and water bodies.

In the territory of the Republic of Sakha (Yakutia) environmental monitoring within subsoil blocks is performed in compliance with the developed and approved environmental monitoring programs.

In 2022, within subsoil blocks of “Surgutneftegas” PJSC in the territory of the Republic of Sakha (Yakutia) environmental monitoring was performed at 19 subsoil blocks, including six blocks where local environmental monitoring (hereinafter – LEM) of the subsoil blocks areas at 97 sampling points was performed and at all 19 blocks – monitoring in the areas of waste disposal (sludge pits).

This report presents the results of LEM of the territories of the Central Block of the Talakanskoye oil and gas condensate field, Alinsky, Severo-Talakansky, Vostochno-Talakansky, Vostochno-Alinsky and Yuzhno-Talakansky subsoil blocks.

During organization of monitoring, the regional features were taken into consideration: developed river net, existence of temporary (drying up with the seasonal runoff) brooks, which appear mainly during the spring flooding, open and closed lakes with marshlands in bottom-lands of the small rivers and brooks, the results of evaluation of the current background pollution of the block as well as the location of the production facilities. Monitoring points are installed at major water bodies, at the prevailing types of soils as well as the areas where the Company’s production facilities are placed that pose potential environmental risks. All points are fixed in the field by identification marks containing information about number, geographical coordinates and name of the subsoil block.

Monitoring points network is divided into two groups:

- baseline monitoring points located outside the zone of the direct impact of man-made facilities;
- monitoring checkpoints located in the areas of potential sources of a man-made impact.

Natural environment components under study: surface waters, bottom sediments, soils, ambient air.

Table 1. The structure of the observational network of LEM within subsoil blocks of “Surgutneftegas” PJSC in the Republic of Sakha (Yakutia)

| Natural environment components | Number of points | | Number of controlled parameters |
|--------------------------------|------------------|---------|---------------------------------|
| | Baseline | Control | |
| Ambient air | 6 | 6 | 5 |
| Surface waters | 12 | 26 | 21 |

| Natural environment components | Number of points | | Number of controlled parameters |
|--------------------------------|------------------|---------|---------------------------------|
| | Baseline | Control | |
| Bottom sediments | 10 | 25 | 13 |
| Soils | 6 | 6 | 25 |

The laboratory sample analysis was carried out by an in-house accredited laboratory of Oil and Gas Production Division "Talakanneft" of "Surgutneftegas" PJSC (accreditation certificate No. ROSS RU.0001.517587 dated 31.10.2014) according to approved methodology in compliance with the current directives and guidelines. Lower range of pollutant detection techniques does not exceed established standards for the safe content level (maximum allowable concentrations (MAC), approximate permissible concentration (APC), safe reference levels of impact (SRLI), etc).

The results of researches are submitted to authorized government bodies as hard copies until the 1st of April of the year following the reporting year.

Surface waters

In 2022, 135 samples of surface waters from six subsoil blocks where LEM is performed were taken and examined. Samples were taken in a snowless period from June till September.

The average concentration of hydrochemical indicators of LEM was calculated following the researches. Evaluation of the results of surface waters at subsoil blocks is performed in compliance with the current specified parameters (MAC) established by Order No. 552 of the Ministry of Agriculture of the Russian Federation "To approve the water quality standards for water bodies of fishery importance, including standards for maximum permissible concentrations of harmful substances in the waters of water bodies of fishery importance" dated 13.12.2016.

Table 2. Average concentration of hydrochemical indicators determined in surface waters in 2022

| Hydrochemical indicator | Unit | Average value of hydrochemical indicators in 2022 | MAC | Ratio of average values to MAC |
|---------------------------------------|-----------------------------------|---|-------|--------------------------------|
| pH value | pH unit | 7.3 | n/a | - |
| Electrical conductivity | mmhos/cm | 196 | n/a | - |
| Ammonium | mg/dm ³ | <0.1 | 0.5 | <0.2 |
| Nitrate ion | mg/dm ³ | <0.1 | 40 | <0.0025 |
| Biochemical oxygen demand (total BOD) | mgO ₂ /dm ³ | 2.2 | 3.0 | 0.73 |
| Phosphate ion | mg/dm ³ | <0.1 | 0.2 | <0.5 |
| Sulfate ion | mg/dm ³ | 24.1 | 100 | 0.24 |
| Chloride ion | mg/dm ³ | 10.5 | 300 | 0.035 |
| Anionic surfactants | mg/dm ³ | <0.025 | 0.1 | <0.25 |
| Oil products | mg/dm ³ | <0.02 | 0.05 | <0.4 |
| Phenols (volatile) | mg/dm ³ | <0.0005 | 0.001 | <0.5 |
| Iron | mg/dm ³ | 0.23 | 0.1 | 2.3 |

| Hydrochemical indicator | Unit | Average value of hydrochemical indicators in 2022 | MAC | Ratio of average values to MAC |
|-------------------------|---------------------|---|-------------------------------|--------------------------------|
| Lead | mg/dm ³ | <0.002 | 0.006 | <0.33 |
| Zinc | mg/dm ³ | 0.0022 | 0.01 | 0.22 |
| Nickel | mg/dm ³ | <0.005 | 0.01 | <0.5 |
| Manganese | mg/dm ³ | 0.019 | 0.001 (Mn ²⁺) | 1.9 |
| Chrome | mg/dm ³ | <0.002 | 0.02 (on Cr ⁶⁺) | <0.1 |
| Copper | mg/dm ³ | 0.0021 | 0.001 | 2.1 |
| Mercury | mcg/dm ³ | <0.01 | 0.01 | <1 |
| Suspended substance | mg/dm ³ | 3.5 | depends on natural conditions | - |
| toxicity level | s.u. | 0.18 | n/a | - |

Water courses in the territory under study are located within the area of karst rocks. Water courses that disappear during the summer, the mismatch of watersheds of surface and underground waters are typical of karst regions. This results in an underground flowing of waters between river basins, the share of underground waters in the river recharge reaches 35-45%, the share of snow and rain recharge are approximately the same. In the winter period, the rivers are recharged solely by underground waters that are relieved into channel alluvial sediments. The natural state of rocks and soils in the territory forms geochemical specifics of surface watercourses in which almost widespread exceedance of the approved standards related to iron, manganese and copper is observed.

Concentration of oil products and chlorides in surface waters which characterize the man-made pollutant flux in oil production regions has special urgency when assessing the environmental situation in the region. In 2022, MAC exceedance of chlorides and oil products in surface waters was not identified.

Generally, the chemical composition of the analyzed water courses and water bodies is characterized by features common to the waters of the region.

Bottom sediments

In 2022, 35 samples of bottom sediments from subsoil blocks were taken and analyzed. These samples were taken at the subsoil blocks where LEM is performed. The samples were taken once per year at sampling points of the surface water in summer.

There are no federal pollution standards set for the content of pollutants in the bottom sediments.

For the reporting period, the total form of metals in the bottom sediments samples was taken into account.

Table 3. Average values of determined indicators in bottom sediments when analyzing the background pollution level (2006 – 2012) and when performing LEM in 2022

| Indicator | Unit of measure | Average values of determined indicators | |
|-----------|-----------------|--|------------|
| | | Background pollution level (2006 - 2012) | LEM (2022) |
| pH value | pH unit | 6.8 | 7.2 |
| Chlorides | mg/kg | 19.9 | 13.1 |
| Sulfates | mg/kg | 161 | 28.2 |

| Indicator | Unit of measure | Average values of determined indicators | |
|---|-----------------|---|------|
| Oil products | mg/kg | 69 | <50 |
| Iron (total content) | mg/kg | 4933 | 4329 |
| Lead (total content) | mg/kg | 5.0 | 4.9 |
| Zinc (total content) | mg/kg | 76 | 35 |
| Manganese (total content) | mg/kg | 533 | 281 |
| Chrome (total content) | mg/kg | 16.1 | 10.3 |
| Copper (total content) | mg/kg | 8.8 | 6.9 |
| Nickel (total content) | mg/kg | 16.8 | 12.2 |
| Specific electrical conductivity of the water extract | mmhos/cm | 166 | 91 |
| toxicity level | s.u. | 0.20 | 0.21 |

The current bottom sediments condition of blocks was assessed against results of background pollution measurement, determined in 2006-2012.

The average values of indicators determined in samples of bottom sediments taken in 2022 do not exceed the average values of the background pollution level determined in 2006-2012.

Soils

In 2022, 12 samples taken from subsoil blocks where LEM was performed, were analyzed as part of environmental monitoring.

Table 4. Average values of indicators determined in soils in 2022

| Indicator | Unit of measure | Average values of determined indicators | MAC / APC | Ratio of average values to MAC |
|---------------------------|-----------------|---|-----------|--------------------------------|
| pH of the water extract | pH unit | 6.7 | n/a | - |
| Chlorides | mg/kg | 6.0 | n/a | - |
| Sulphates | mg/kg | 13.7 | n/a | - |
| Exchangeable ammonium | mg/kg | <5 | n/a | - |
| Nitrates | mg/kg | <1 | 130 | <0.008 |
| Phosphates | mg/kg | <1 | n/a | - |
| Oil products | mg/kg | <50 | n/a | - |
| Iron (total content) | mg/kg | 3124 | n/a | - |
| Manganese (total content) | mg/kg | 394 | 1500 | 0.26 |
| Zinc (total content) | mg/kg | 54 | 220 | 0.25 |
| Lead (total content) | mg/kg | 4.8 | 130 | 0.04 |
| Nickel (total content) | mg/kg | 22.2 | 80 | 0.28 |
| Copper (total content) | mg/kg | 7.9 | 132 | 0.06 |
| Chrome (total content) | mg/kg | 13.7 | n/a | - |
| Iron (active form) | mg/kg | 205 | n/a | - |
| Manganese (active form) | mg/kg | 45 | n/a | - |
| Zinc (active form) | mg/kg | 2.0 | 23.0 | 0.09 |
| Lead (active form) | mg/kg | <0.5 | 6.0 | <0.08 |
| Nickel (active form) | mg/kg | 1.0 | 4.0 | 0.25 |

| Indicator | Unit of measure | Average values of determined indicators | MAC / APC | Ratio of average values to MAC |
|---|-----------------|---|-----------|--------------------------------|
| Copper (active form) | mg/kg | 1.2 | 3.0 | 0.4 |
| Chrome (active form) | mg/kg | 0.8 | 6.0 | 0.13 |
| Organic substance | mg/kg | 5.6 | n/a | - |
| Benz(o)pyrene | mg/kg | <0.001 | 0.02 | <0.05 |
| Specific electrical conductivity of the water extract | mmhos/cm | 122 | n/a | - |
| toxicity level | s.u. | 0.18 | n/a | - |

Note: MAC / APC are set by SanPiN 1.2.3685-21 "Hygienic standards and requirements ensuring safety and (or) harmlessness of environmental factors for humans." Types of soils - rendzina, loamy and clay.

The average values of determined indicators in soil samples taken as part of LEM in 2022 do not exceed MAC and APC.

Ambient air

In 2022, 12 samples of ambient air from 6 subsoil blocks were examined. These samples were taken at the subsoil blocks where LEM is performed.

The samples were taken at 6 baseline monitoring points (least affected by a man and transboundary masses from technological facilities at the blocks) and 6 control points (affected by man-made infrastructure facilities).

Five components were under research: methane, carbon monoxide, sulphur dioxide, nitrogen monoxide and nitrogen dioxide.

In accordance with environmental monitoring programs the ambient air quality assessment was carried out on the basis of comparison of the results of the quantitative chemical analysis with MAC and SRLI standards. Levels exceeding hygienic standards were not determined.

Thus, the comprehensive analysis of the results of environmental monitoring within subsoil blocks of "Surgutneftegas" PJSC for 2022 shows that the Company's oil production facilities located within the Republic of Sakha (Yakutia) do not have a significant negative environmental impact. The overall characteristic of the environmental situation in the area where the Company operates is favorable. The impact of the Company's production facilities is characterized as acceptable, i.e. it maintains the quality of the environment.