

# Results of environmental monitoring at "O'zbekiston Mustaqilligi" Investment Block in 2024







### Contents

NTAL AND BIOLOGICAL MONITORING
AL MONITORING
SE OBSERVATION STATIONS (EOPN)
NG
ONDS
IG
TE MONITORING
G
LOGICAL ZONES





SECTION	Title:
6.3	SKETCH MAP OF ENVIRONMENTAL BASE OF FLORA AND FAUNA OF "MUSTAQILLIKNING
6.4	SKETCH MAP OF BACKGROUND MONITORING OF "MUST
6.5	SKETCH MAPS OF DISTRIBUTION OF RAR AT ENVIRONMENTAL MONITORING SITES
6.6	SKETCH MAPS OF DISTRIBUTION OF RAR AT INDUSTRIAL MONITORING SITES
6.7	RESULTS OF FLORA MONITORING IN 2024
6.8	RESULTS OF FAUNA MONITORING IN 2024
6.9	COMPARATIVE ANALYSIS OF RECORDS FC
7	CONCLUSIONS

OBSERVATION STATIONS AND LOCAL MONITORING STATIONS OF G 25 YILLIGI" FIELD

ORING STATIONS OF FLORA AND FAUNA DURING INDUSTRIAL AQILLIKNING 25 YILLIGI" FIELD

E, INDICATOR AND COMMON SPECIES OF VERTEBRATE ANIMALS

E, INDICATOR AND COMMON SPECIES OF VERTEBRATE ANIMALS

DR 2021-2024







### 1. Introduction

According to the requirements of approved Industrial Environmental Monitoring Program, specialists of Analytical Monitoring Centre carried out 2 field surveys in 2024 (in spring and summer of 2024) to study the condition of: atmospheric air, surface watercourses, groundwater, soil and subsoil, radiation situation. "BEZOPASNOST' I KONTROL" LLC (hereinafter-BIK) carried out 1 spring visit to the site to monitor the state of flora and fauna (hereinafter - Biomonitoring) during the following oil and gas operations at "O'zbekiston Mustaqilligi" Investment Block:

 $\succ$  drilling and testing of wells at "Mustaqillikning 25 Yilligi" field; > construction of Boysun GPP and infrastructure facilities.

Environmental monitoring survey was carried out for the following aspects:

- $\checkmark$  atmospheric air;
- $\checkmark$  surface watercourses and streams;
- $\checkmark$  soil, subsoil and landscape;
- ✓ radiation situation;
- ✓ production and consumption waste;
- $\checkmark$  flora and fauna.



### 2. Goals and objectives of survey

The goal of Biomonitoring is to assess the impact of The goal of industrial environmental monitoring is to Operator's production activities on environment in the areas assess the impact of production activities carried out by where they are carried out, as well as to provide Operator SURHAN GAS CHEMICAL OPERATING COMPANY FC LLC with reliable information on changes in the state of (hereinafter referred to as Operator) on the natural environment in order to take prompt measures to prevent, environment in order to take timely measures to prevent eliminate or minimize negative consequences. possible negative impacts.

- The objectives are:
  - ✓ assessment of the actual state of the natural environment;
  - $\checkmark$  comparison of received information with the data of the Environmental Audit (2017-2018) carried out before the start of oil and gas operations, as well as a comparative analysis with environmental monitoring of previous years;
  - $\checkmark$  monitoring the state of the natural environment and changes occurring in the contract area;
  - ✓ predictive assessment of the impact of industryrelated processes on the state of the natural environment in the Contract area.

Biomonitoring is carried out for the purpose of obtaining data for post-project analysis and current information on the state of flora and fauna.

Biomonitoring is an integral part of Departmental Environmental Monitoring. Conducting Biomonitoring is aimed at providing the structural units of Operator, as well as its contractors performing oil and gas operations in the Contract Areas, with information on changes in the species composition and number of flora and fauna.













### 3. GENERAL PRINCIPLES OF ENVIRONMENTAL MONITORING



In 2024, within the scope of Environmental Monitoring, Operator continued survey to assess the impact of oil and gas operations on environmental compartments at "O'zbekiston Mustaqilligi" Investment Block. The survey was carried out by the Specialized Analytical Monitoring Centre under the Ministry of Ecology, Environmental Protection and Climate Change of the Republic of Uzbekistan (hereinafter referred to as the Ministry of Ecology of RUz) within the scope of concluded contract in accordance with "Program for industrial environmental monitoring of environment condition during oil and gas operations at "O'zbekiston Mustaqilligi" Investment Block performed by Operator in 2024-26", this program being approved at the meeting of HSE subcommittee and agreed with the Ministry of Ecology of RUz.

The complex of environmental studies included measurements of meteorological parameters of the territory, field survey of the area, flora and fauna, sampling of soil and subsoil, surface and groundwater, atmospheric air, with corresponding laboratory analyses, processing of results and issuance of conclusions. The map shows Eco-Audit 2017-2018 (EA 2017) observation stations and Ecomonitoring points for 2024. At each local and background observation station, in accordance with the Calendar schedule, the territory's meteorological parameters were measured, samples of atmospheric air, surface water, soil were taken, and radiation measurements were carried out.













## 4. Specification of environmental base observation stations (EOPN)

To assess the changes in the level of pollution of environmental compartments, the territory of "O'zbekiston Mustagilligi" Investment Block is conditionally divided into 4 ecological zones, characterized by homogeneous natural conditions, landscape, sources and degree of pollution.

#### Zone III - Western

EOPN 3 covers the watershed of the Khangaronsai and the Alakutansai. The landscape consists of dry foothill slopes (adyrs) and ravines with sandstone outcrops, with areas of dry land; the soil is sandy loam.





#### Zone IV - Southern

EOPN No. 4 is the wide channel of the Alakutansai from the place where it flows into the Khangaronsai and the dissected slopes along its left bank. The landscape consists of dry foothill slopes (adyrs) and ravines with sandstone outcrops.



#### Zone | - Northern

EOPN No. 1 covers the agrolandscapes along the left bank of the Khangaronsai between the village of Kofrun, the settlement of Urtabuz and the Anjaransai valley. The landscape is represented by dry fields and fallow lands in combination with the slopes of hilly foothills (adyrs), dissected channels of temporary watercourses and dry ravines with sandstone outcrops.





Zone II - Eastern

EOPN No. 2 is located between the right side of the middle reaches of the Khangaronsai and the Karagul tract on dry, dissected foothill slopes with ravines and sandstone outcrops - sandy loam soil.









### 5. RESULTS OF ENVIRONMENTAL MONITORING 5.1 Meteorological parameters

- evening hours the temperature was lower, in contrast to daytime readings.
- from 0.9 to 2.7 m/sec, prevailing winds were south-western and north-western.
- periods of the surveyed territory.



survey at survey stage I.

survey at survey stage II.

> Based on the results of field survey conducted in the spring, summer and autumn periods of 2024 and observations of the main meteorological parameters throughout the surveyed area, it can be noted that during the survey period, as in the previous year, north-western, north-eastern and south-western winds prevailed, the winds were gusty, with the speed from 0.7 m/sec (calm) to 15.2 m/sec. The distribution of air temperature values fluctuated in spring from 6.7°C to 23.4°C, in summer from 27.8°C to 39.8°C, depending on the time of measurements, in the morning and

> In the first stage of industrial monitoring in the surveyed area, the air temperature fluctuated from 10.8°C to 23.4°C, atmospheric pressure – from 691 to 712 mm Hg, wind velocity - from 1.0 to 15.2 m/sec, prevailing winds were the south-western and north-western; in the second stage of industrial monitoring in the surveyed area, the air temperature fluctuated from 27.8°C to 35.4°C, atmospheric pressure – from 682 to 700 mm Hg, wind speed –

> The determined values of meteorological parameters correspond to the average climatic readings of the spring, summer and autumn observation









### 5. RESULTS OF ENVIRONMENTAL MONITORING 5.2 Atmospheric air monitoring

According to the Program, at all stages of industrial environmental monitoring, the study of the state of atmospheric air at "O'zbekiston Mustaqilligi" Investment Block was carried out at: four EOPN (No. 1, 2, 3, 4), five local observation stations (L-A-1, L-A-2, L-A-3, L-A-4, L-A-5), eight cluster sites (K-1, K-2, K-3, K-4, K-5, K-6, K-8, K-10) and well No. 1 Kognysai. The level of atmospheric air pollution was assessed in relation to the sanitary and hygienic standards developed and approved by the Ministry of Health of the Republic of Uzbekistan - SanPiN No. 0293-11 "List of maximum permissible concentrations (MPC) of pollutants in the atmospheric air of populated areas on the territory of the Republic of Uzbekistan". <u>The results of survey of atmospheric air composition have shown the following:</u> >The nitrogen dioxide content as a whole did not change significantly compared to the last year's figures and did not exceed the maximum permissible concentrations, remaining at a level of up to 0.9 MPC one time concentration, with the exception of the territory of two cluster sites KP-10 and KP-2 at the first stage of the survey, where some excess of the established standards was observed by 1.1 and 1.3 times, respectively. This one-time excess of nitrogen dioxide content in the atmospheric air is presumably associated with the direction of the wind blowing from the side of location of special vehicles or internal combustion engines used in drilling and involved in the work on well development.

>The content of carbon monoxide in the atmospheric air of the surveyed cluster sites at the first and second stages of observations did not exceed the established standard values and was at a level of up to 0.4 MPC one time concentration. In total, the carbon monoxide content in the atmospheric air this year is slightly lower than the last year's values. >The content of sulphur dioxide in the atmospheric air of all surveyed cluster sites has not changed significantly compared to the data of previous years and is recorded at a level of up to 0.3 MPC one time concentration. Throughout the entire monitoring period this year, as in the past, the content of sulphur dioxide in the atmospheric air does not exceed the established level of maximum permissible concentration.



















 $\geq$  The content of hydrogen sulphide in the atmospheric air of the entire surveyed area did not exceed the established standards 10 at all stages of observation this year. In general, the content of hydrogen sulphide in the atmospheric air of the surveyed area this year corresponds to the data of 2022-2023 and is slightly lower than the values of 2021, when its maximum concentration was recorded at the level of 1.7 MPC one time concentration.

>On the territory of the cluster sites during the monitoring period this year, the content of hydrogen sulphide in the atmospheric air exceeded the established standard value (MPC one time concentration) only at one observation point at the second stage of monitoring - KP-2, where its concentration was recorded at the level of 1.4 MPC one time concentration. A possible reason for this may be the availability of filled slurry ponds at the time of the survey, the wastewater in which has an increased content of hydrogen sulphide. In the rest of the surveyed area, the hydrogen sulphide content in the atmospheric air did not exceed standard values and generally corresponds to the data from previous stages of monitoring.



Рис. 2.3. Содержание сероводорода в атмосферном воздухе обследованной территории за I, II, III этапы 2023 и I, II этапы 2024 года







>It should be noted that the concentration of hydrogen sulphide in the atmospheric air in the territory of mothballed wells (provided that there is no accumulation of wastewater, which may have an increased content of hydrogen sulphide) is lower than the established standard value, which may indicate that the level of hydrogen sulphide in the atmospheric air decreases (dissipates) when the works are completed and the wells are suspended.



- levels of impact (SRLI).

Conclusion: In general, the survey results showed that the level of atmospheric air pollution with inorganic dust, carbon monoxide, nitrogen dioxide and hydrocarbons in the contract area does not exceed the maximum permissible concentration and background indicators of EA 2017. The atmospheric air does not experience increased man-made and industry-realted burden from the Operator's activities.



Of hydrocarbons, as in previous years (2017-2022), only methane was detected in the atmospheric air, but its concentrations do not exceed the safe reference

According to the results of field and laboratory studies in the spring, summer and autumn periods, no significant impact on the atmospheric air was noted during oil and gas operations at "O'zbekiston Mustaqilligi" investment block.





### 5. RESULTS OF ENVIRONMENTAL MONITORING 5.3 Surface watercourse condition

Water condition was surveyed in the surface water of the Khongaronsai at:

L-W-4

The environmental parameters pH and water temperature were determined in water in field conditions. To determine the concentration of oil products, samples were taken in special glassware. Pollutants in water were measured as per Program. Due to the lack of water, sampling of surface and ground water was not carried out at the following points at stage I of monitoring: in surface water of EOPN No. 1 (Northern zone) and EOPN No. 3 (Western zone); at stage II at the following points: in surface water of EOPN No. 1, L-W-1 (Northern zone), EOPN No. 3 (Western zone) and L-W-4 (Southern zone).

#### The following were determined in surface water samples:

- $\checkmark$  Water temperature,
- ✓ pH,
- $\checkmark$  electric conductivity,
- $\checkmark$  suspended matters,
- $\checkmark$  suspended-materials concentration,

- ✓ dry residues,
- ✓ COD,
- ✓ BOD,
- ✓ nitrite nitrogen,
- ✓ nitrate nitrogen,

- $\checkmark$  mineralization,
- ✓ hydrogen sulphide,

EOPN No. 1

- ✓ chlorides,
- ✓ sulphates,
- $\checkmark$  phosphates,

- $\checkmark$  petroleum products,
- $\checkmark$  phenols,
- ✓ manganese,
- ✓ iron,

EOPN No. 3

✓ lead.









A comparative assessment of change in the Khongaronsai surface water over the observed periods shows that: > in the surface water of the Khongaransai, the content of petroleum products fluctuates at the level of 0.0484-0.943 mg/dm3. In the river water at the observed point L-W-3 at stage II of 2023, a minimum content of oil products of up to 0.0484 mg/dm3 was noted, and at stage II of 2024, in the water of L-W-3, oil products were up to 19.4 times higher than

- the values of 2023.
- there was a slight decrease, and it was at the level of 0.11-0.481 mg/dm3.



Dynamics of pollutant content in the surface water of the Khongaransai within the Contract Area

No wastewater from Operator's production activities is discharged into the surface water of the Khongaronsai.

 $\succ$  In the river water within the Contract area, the manganese content in 2023 was at the level of 0.0387-0.134 mg/l, in 2024 at the level of 0.012-0.0798 mg/dm3. The iron concentration in 2023 was in the range of 0.141-0.568 mg/l, and in 2024









### 5. RESULTS OF ENVIRONMENTAL MONITORING 5.4. Waste water condition in slurry ponds

In accordance with the Program, condition of wastewater in slurry ponds was monitored.

- (KP-1, KP-2, KP-8);
- zone III (KP-1, KP-2).



> The first stage of observations was carried out in two observation zones at five monitoring stations: zone II (KP-4, KP-6) and zone II

> The second stage of observations was carried out in two observation zones at four monitoring stations: zone II (KP-4, KP-6) and





14





#### 5.4. Waste water condition in slurry ponds



Dynamics of the content of indicators in wastewater of the slurry pond of zone III for 2023-2024.







### 5.4. Waste water condition in slurry ponds

The condition of wastewater was studied at five observed slurry ponds; the slurry pond discharges are brown, with sticky sediments that are difficult to filter, covered with oily films, and have a sharp, specific odour—the decay of organic matter. All observed slurry ponds showed high levels of suspended solids, sulphates, chlorides, hydrogen sulphide, petroleum products, phenol, and heavy metals (iron, manganese, lead). The content of hydrogen sulphide in wastewater is at the level of 4.0-58.2450 mg/dm3, petroleum products at the level of 1.02-26.70 mg/dm3. The maximum concentration of petroleum products and hydrogen sulphide was recorded in the wastewater from the slurry pond of zone II (KP-4). There are no nitrates, nitrites or phosphates in wastewater.

Since waterproofing of the bottom and sides of the slurry ponds was used during construction of the slurry ponds, the entry of waste water into the soil and groundwater during storage is excluded, and after the end of drilling, the waste drilling water together with the slurry is subject to neutralization by the method of reagent coagulation and burial. Thus, water pollution is not entirely declarative by the parameters of comparison with MPC, since there is no discharge of wastewater into ground and surface water from the slurry ponds of the cluster sites.



### 5. RESULTS OF ENVIRONMENTAL MONITORING 5.5 Soil and subsoil condition monitoring.

EOPN No. 1-4 are the stations for assessing the natural level of soil pollution, which depends only on the degree of impact of natural conditions (background).

- L-S-3, L-S-4.
- subsoil samples were taken from the humic horizon (0.3-0.8 m).  $\succ$  Soil and subsoil samples for petroleum products were collected separately.

the Environmental Monitoring Program.

# The following parameters were determined in the soil and subsoil

samples: √рН, ✓ dry residue of ✓ sulphates, aqueous extract, ✓ calcium, ✓ chlorides, ✓ magnesium,

> Monitoring of the condition of soil and subsoil is carried out at the following local stations: L-S-1, L-S-2,

 $\succ$  At background and local stations, soil samples were taken from the humus horizon (0-0.3 m), and

 $\geq$  In total, 64 samples were collected and 288 tests were performed in two stages, in accordance with

✓ sulphates, ✓ calcium, ✓ magnesium,







### 5.5 Soil and subsoil condition monitoring.

- ranges from 0.042% to 0.075%;
- 1.2-3.5 times, which is higher than the 2023 values (exceeding up to 1.5 times);
- No. 4 by up to 1.4 times, in the soil of the local observation station L-S-2 by 2.1 times;
- 1.6 and 2.5 times.
- 1.6 and 2.5 times.



Content of ingredients in soil and subsoil at local observation stations (in fractions of MPC for sulphates, in fraction of background for dry residue, chlorides, calcium, magnesium) at stage II of observations in 2024.

> Observation data from two stages show that the soil and subsoil collected at EOPN No. 1-4 have a faintly alkaline reaction with a pH value from 7.37 to 8.60. The soil and subsoil of local stations have a pH of 7.60 to 8.65, and the content of dry residue of aqueous extract from soil

> According to 2024 data, the chloride content in the soil and subsoil of local stations L-S-1, L-S-2 and L-S-4 exceeds the background levels by

> The maximum permissible concentration for sulphates was exceeded at the base observation stations: in the soil of EOPN No. 3 and EOPN

The calcium content exceeds background values in soil and subsoil of local stations L-S-1, L-S-2 and L-S-3 by 1.3-2.5 times. Magnesium content in the soil of stations L-S-3 and L-S-4 were exceeded by 1.6 and 1.5 times, respectively, and in the soil of stations L-S-2 and L-S-3 by

> The calcium content exceeds background values in soil and subsoil of local stations L-S-1, L-S-2 and L-S-3 by 1.3-2.5 times. Magnesium content in the soil of stations L-S-3 and L-S-4 were exceeded by 1.6 and 1.5 times, respectively, and in the soil of stations L-S-2 and L-S-3 by

> Content of petroleum products in soil and subsoil at local and background stations (in mg/kg) at stages I, II of observations in 2024.







### 5.5 Soil and subsoil condition monitoring.

Within the scope of implementation of industrial environmental monitoring over the condition of the natural environment during oil and gas operations at "O'zbekiston Mustaqilligi" Investment Block carried out in 2024, the condition of landscape of sites was examined on site for possible deterioration of territory environment as a result of construction of wells at the field. Monitoring of soil and subsoil of cluster sites in accordance with the Program was carried out at each well at 3 local stations: near the wellhead, the drilling waste pit, and near the location of fuel and lubricants. The areas of 9 cluster sites were surveyed: KP-3, KP-5, KP-4, KP-6, KP-10, KP-1, KP-2, KP-8 and Kognysai No. 1. Total 216 samples were taken, and 972 chemical analyses were performed over the two stages.

The results of soil and subsoil survey, as in previous years of observations, showed changes in the salt composition: in the quantitative content of salts, in the ratio of components and their distribution across the soil horizon. The instability of the ingredients' indicators is associated with the seasonal redistribution of components between the layers of soil and subsoil under the influence of atmospheric precipitation and air temperature fluctuations. The established presence of petroleum products in soil and subsoil is industryrelated in nature and is associated with ongoing operational work, storage of drill cuttings, placement and use of fuels and lubricants.

Conclusion: Based on the results of laboratory tests, no significant impact on the condition of soil and subsoil during oil and gas operations at "O'zbekiston Mustagilligi" Investment Block was observed.





### 5.6. ENVIRONMENTAL RADIATION MONITORING

Environmental monitoring was carried out in accordance with the Technical Assignment and the Survey Program in 3 areas:

- measurement of the exposure dose rate (EDR) of gamma radiation on the soil surface;

- measurement of the total specific alpha activity (TSAA) of soil and subsoil;

- determination of the content of natural radionuclide radon-222 (222Rn) in surface water.

(contract area, wellhead, slurry pond, fuel and lubricants warehouse, etc.).

background values and permissible sanitary standards.

In addition, according to the Program, water samples were taken from evaporation ponds of cluster sites to determine radon (222Rn). Conclusion: Based on the results of radiation monitoring, no excesses of the established standards for radiation-environmental indicators were observed at any monitering station of levelation parmeters in diates no its positive i a ferroit la hod es thas aile and other. Nontaction of i deposition of our technic here a vait and samples comply with the requirements of SanPin No. 0193-06 (NRB-2006).

- Radiation parameters were measured at background observation stations (natural level) and local observation stations
- During the period of industrial environmental monitoring, during construction of wells, to study the radiation situation on the territory of site, at 9 stations, measurements of EDR of external gamma radiation were carried out, and soil and subsoil samples were taken from two horizons (from a depth of 0-30 cm and 30-80 cm) to determine the "Total specific alpha activity (TSAA)", and water samples were taken at 5 stations to determine the content of natural radionuclide-radon (<sup>222</sup>Rn). The values of external gamma radiation exposure dose and total specific alpha activity (TSAA) at the site do not exceed





### 5.7. MONITORING OF PLACES FOR TEMPORARY COLLECTION OF PRODUCTION AND CONSUMPTION 21 WASTE

According to the Industrial Environmental Monitoring Program in 2024, two stages of environmental monitoring of production and consumption waste were carried out, and the mechanism for organizing work on collection, accumulation, transportation, processing, disposal, neutralization and allocation of drilling waste was also studied.

During the I stage of monitoring of production waste formation at cluster sites this year, non-compliance with requirements for abandonment or suspension of wells at KP-3 and KP-5 was detected, which leads to soil and groundwater pollution.



During the II stage of monitoring of production waste formation at cluster sites this year, it was identified that non-compliance with the requirements for abandonment or suspension of wells at KP-3 and KP-5 detected during the I stage of monitoring was eliminated. At the remaining surveyed cluster sites, the condition of storage areas during oil and gas operations at wells was satisfactory as of the moment of industrial monitoring.

Conclusion: In general, the condition of storage areas during oil and gas operations at wells at the time of departmental environmental monitoring is satisfactory.









## 6. RESULTS OF BIOLOGICAL MONITORING **6.1. GENERAL PRINCIPLES OF BIOMONITORING**

At the stage of construction of BGPP facilities, the environmental base observation network plan was used, where each observation station characterizes a certain typical zone, and the entire network characterizes ecological changes in the area as a whole. In accordance with one of the main principles of monitoring - integrated approach, the observation stations that monitor various environmental compartments are combined into a single environmental base observation network - EONS.

Environmental observation base stations (EOPN), in terms of biological monitoring, mean background stations selected based on preliminary survey of the state of environment and sources of impact on it.

EONS provides a truer picture of potential impact of Operator's activities on the monitored territory and its change over the time.

At EONS, during operations for natural gas recovery and processing within the boundaries of "Mustaqillikning 25 Yilligi" field, the targets for biological monitoring are:

- 1) higher vascular plants;
- 2) herpetofauna (amphibians and reptiles);
- 3) ornithofauna
- 4) theriofauna







#### **6.2. SPECIFICATION OF BIOMONITORING ECOLOGICAL ZONES**

Zone III – the Western zone of moderate development of low mountain reliefs in the upper reaches of the Alakutansai.

The western zone covers the watershed of the Khangaronsai and the Alakutansai. The landscape

consists of dry foothill slopes (adyr sandstone outcrops, with areas of r is sandy loam.

#### Within zone III, there are

clusters No. 1, 2 and 8, as well as inear facilities to these cluster sit

Zone IV - the Southern zone, the valley of the lower reaches of Alakutansai. The southern zone is the wide channel of the Alakutansai from the place where it flows into the Khangaronsai and the dissected slopes along its left bank. The landscape consists of dry foothill slopes (adyrs) and ravines with sandstone outcrops. Within zone IV there is an industrial waste landfill and evaporation ponds of the BGPP. A water pipeline runs through the area.







Zone V - Kognysai site (single wells) from the turn off the road between the villages of Chilonzor and Beshirkak to well 1J. Dry saline foothill slopes and ravines with sandstone outcrops, gulches, clayey, saline soil. Vegetation: native ephemeralsaltwort associations, fragments of tugai yulgun associations along the bed of the sai.



#### Zone I - the Northern zone of active agricultural landscape.

The northern zone covers the agrolandscapes along the left bank of the Khangaronsai between the village of Kofrun, the settlement of Urtabuz and the Anjaransai valley. The landscape is represented by rainfed fields and fallow lands in combination with the slopes of hilly foothills (adyrs), dissected channels of temporary watercourses and dry ravines with sandstone outcrops.



Zone II - the Eastern zone of moderate development of adyrs and low mountains on the left bank of the Khongaronsai.

The eastern zone is located between the right side of the middle reaches of the Khangaronsai and the Karagul tract on dry, dissected foothill slopes with ravines and sandstone outcrops - sandy loam soil.

Zone II includes the BGPP itself, a warehouse for building materials, block sulphur storage area, clusters No. 4, 6, 10 and linear facilities to all sites.









#### 6.3. SKETCH MAP OF ENVIRONMENTAL BASE OBSERVATION STATIONS AND LOCAL MONITORING STATIONS OF FLORA AND FAUNA OF 4 "MUSTAQILLIKNING 25 YILLIGI" FIELD



#### Environmental base observation network

м.	06	Координаты							
JN≌	Ооъекты	Северная широта	Восточная долгота						
I зона: Северная									
1	ЭОПН № 1	38°06'34.10"	67°17'59.71"						
2	BR-1	38°06'13.50"	67°15'39.65"						
3	BR-2	38°05'2.23"	67°17'39.23"						
4	BR-3	38°05'26.35"	67°19'14.12"						
5	BR-4	38°04'36.55"	67°18'01.84"						
	II	зона: Восточная							
6	ЭОПН № 2	38°03'41.69"	67°19'56.42"						
7	BR-5	38°02'56.97"	67°17'43.48"						
8	BR-6	38°02'01.75"	67°18'46.96"						
	II.	I зона: Западная							
9	ЭОПН № 3	38° 04'33.07"	67°15'10.58"						
10	BR-7	38°02'42.49"	67°14'18.96"						
11	BR-8	38°03'52.04"	67°16'52.74"						
IV зона: Южная									
12	ЭОПН № 4	37°59'33.32"	67°19'03.49"						
13	BR-9	37°59'54.98"	67°18'06.05"						
14	BR-10	38°00'50.31"	67°17'20.30"						
		ИТОГО	14						







#### 6.4. SKETCH MAP OF BACKGROUND MONITORING STATIONS OF FLORA AND FAUNA DURING INDUSTRIAL ENVIRONMENTAL MONITORING OF "MUSTAQILLIKNING 25 YILLIGI" FIELD





List of sites for description of flora and fauna resources of cluster sites

Номер пункта мониторинга	Координаты, WGS-84, град/мин/сек	Высота над <u>ур.м</u> ., м	Местонахождение, характеристика ландшаф и растительности
FBr-1	N 38 03 51.36 E 67 16 33 64	791	Фоновая станция для скважины 10. Старая зацежь на правом берегу Хангаронсая
FBr-2	N 38 02 50.61 E 67 16 01.93	760	Фоновая станция для скважины 20Э. Сухие расчлененные склоны верховий Алакутансая овраги с выходами песчаника.
FBr-3	N 38 08 56.26 E 67 29 39.99	782	Фоновая станция для скважины 30Э. Богарнь залежи, сухие слабо расчлененные склоны предгорий, овраги с выходами песчаника.
FBr-4	N 38 03 42.54 E 67 18 13.06	763	Фоновая станция для скважины 40Э. Сухой ов с выходами песчаника, расчлененные склоне предгорий левого берега Хангаронсая.
FBr-5	N 38 04 39.21 E 67 16 45.16	802	Фоновая станция для скважины 5-ОЭ. Сухие расчлененные склоны предгорий и овраги с выходами песчаника на левой террасе Хангаронсая.
FBr-6	N 38 03 18.27 E 67 17 09.89	787	Фоновая станция для скважины 60Э. Сухие расчлененные склоны предгорий и овраги с выходами песчаника.
FBr-7	N 38 06 00.32 E 67 18 58.41	854	Фоновая станция для скважины 7V. Сухие расчлененные склоны предгорий и овраги с выходами песчаника.
FBr-8	N 38 03 49.95 E 67 14 58.62	787	Фоновая станция для скважины 80. Сухие расчлененные склоны предгорий и овраги с выходами песчаника.
FBr-10	N 38 04 37.74 E 67 19 43.65	817	Фоновая станция для скважины 10-О. Урочин Карагуль на сухих расчлененных склонах предгорий.
FBr-1J	N 37 54 32.61 E 67 10 24.65	783	Фоновая станция для скважины 1J. Участок Когнысай. Сухие засоленные склоны предгори овраги с выходами песчаника.
FBr-2J	N 38 05 29.44 E 67 05 08.43	997	Фоновая станция для скважины 2J. Северны сухие расчлененные склоны горы Гаджиркия
FBr-GPZ	N 38 02 13.44 E 67 18 29.64	757	Фоновая станция для ГПЗ. Водораздел Хангаронсая и Алакутансая. Сухие склоны предгорий, овраги с выходами песчаника.
FBr-PPO	N 38 01 41.01 E 67 17 05.00	758	Фоновая станция для Полигона промышленне отходов. Сухие засоленные склоны предгорий овраги с выходами песчаника.









#### 6.5. SKETCH MAPS OF DISTRIBUTION OF RARE, INDICATOR AND COMMON SPECIES OF VERTEBRATE ANIMALS AT ENVIRONMENTAL MONITORING SITES





26





## 6.6. SKETCH MAPS OF DISTRIBUTION OF RARE, INDICATOR AND COMMON SPECIES OF VERTEBRATE ANIMALS AT INDUSTRIAL MONITORING SITES





27

#### 6.7. RESULTS OF FLORA MONITORING IN 2024

		Total	Environmental mc	nitoring stations	Industrial monitoring	Vegetation condition	
Site	Vegetation		Environment-forming plants	Number of species	Environment-forming plants	Number of species	assessment
Northern zone	The vegetation is represented by ephemeral- ephemeroid, wormwood-ephemeral, yantacaceae and ephemeral-yantacaceae plant associations.	35	11	29	9	20	Vegetation degradation 2 phases
Eastern zone	The vegetation is represented by ephemeral- ephemeroid, mimosa-ephemeral-ephemeroid, wormwood-ephemeral-ephemeroid, yantacaceae, ephemeral-yantacaceae and shrub-ephemeral- ephemeroid plant associations.	28	9	18	9	23	Vegetation degradation 2 phases
Western zone	The vegetation is represented by shrub-ephemeral, acanthaceae-ephemeral, mimosa-ephemeral, tamarisk- forb plant associations.	38	7	27	11	23	Vegetation degradation 2 phases
Southern zone	The vegetation is represented by ephemeral- ephemeroid, shrub-forb, shrub (wormwood)- ephemeral, bluegrass-sedge, wormwood-ephemeral plant associations.	33	12	33	8	18	Vegetation degradation 2 phases
Single wells	The vegetation is represented by ephemeral- ephemeroid plant associations.	10			5	10	Vegetation degradation 2 phases







In total, 54 plant species were noted during the spring trip. The condition of the vegetation is satisfactory. No rare species were noted due to the early monitoring period.





#### 6.8. RESULTS OF FAUNA MONITORING IN 2024

The total number of species noted within the scope of biotic monitoring is 64, including:

- ✤ 7 species of reptiles, of which the Central Asian tortoise is included in the Red Book of Uzbekistan;
- Falcon) are listed in the International and/or Red Books of Uzbekistan;
- ✤ 7 species of mammals, among which there are no rare (Red Book) species.

#### **Composition of fauna in environmental monitoring sites**

	Zoi	ne l	Zor	ne II	Zon	ne III	Zone IV		
Animal species	Total quantity	Q-ty of rare species	Total quantity	Q-ty of rare species	Total quantity	Q-ty of rare species	Total quantity	Q-ty of rare species	
reptiles	4	-	3	1	1	1	3	1	
birds	17	2	12	3	18	-	20	3	
mammals	4	-	4	-	4	-	3	-	
	faun <sup>g5</sup> at in	dustrial mo	nitority sites	4	23	1	26	4	

#### auna at muustinai momorin

Animal species	Zone I		Zone II		Zone III		Zone IV		Zone V		Zone VI	
	Total quantity	Q-ty of rare species	Total quantity	Q-ty of rare species								
reptiles	-	-	1	-	-	-	-	-	-	-	-	-
birds	19	3	11	-	4	-	4	2	7	-	3	-
mammals	4	-	3	-	4	-	3	-	3	-	2	-
TOTAL	24	3	15	-	8	-	7	2	10	-	5	-



◆ 50 species of birds – of which 8 species (Lammergeier, Lesser Kestrel, Steppe Eagle, Griffon Vulture, Ferruginous Pochard, Black Vulture, Egyptian Vulture, Barbary





### 6.9. COMPARATIVE ANALYSIS OF RECORDS FOR 2021-2024

The survey records on flora and fauna at the biotopes of "O'zbekiston Mustaqilligi" investment block of Surhan Gas Chemical Operating Company FC LLC show the distinctive species richness of the Pamir-Alai mountain system in its adyr zone. The analysis of the species diversity of the vegetation cover on the territory of the Investment Block for 2021-2024 showed patterns in formation of species complexes for each of the sites with definition of dominant species and edificator species, both for Environmental Monitoring sites and for Industrial Monitoring sites indicated in Table 9.1.1 and 9.1.2 of the Final Biomonitoring Report for 2024.

The habitats of the Northern, Western and Southern zones are in satisfactory condition, there are watering places for wild animals. Moderate grazing of small cattle is observed among the local population. The habitats of the Eastern zone have been most transformed by Operator, since the BGPP site is located right here. These changes are most visible at station BR-5, where linear facilities are being laid. It is not possible to detect the availability and count the numbers of such a diversity of species, each of which is characterized by both seasonal and daily cycles of activity, in just a few short-term biotic monitoring trips. At the same time, all types of habitats are characterized by a set of species, the availability of which indicates the ecological state of the territory. A comparative analysis of encounters with amphibians and reptiles within the scope of Biomonitoring at the Operator's sites in 2021-2024 is shown in Tables 9.2.1 and 9.2.2 of the Final Biomonitoring Report for 2024.

Conclusion: In general, the state of flora and fauna in "O'zbekiston Mustagilligi" investment block is assessed as natural with natural fluctuations in population. Based on the results of monitoring survey conducted in 2024, no negative impact from the Operator's activities on flora and fauna has been identified.





### 7. CONCLUSIONS

It should be noted that in accordance with the requirements of the Program, 3 stages of industrial environmental monitoring and 2 stages of biomonitoring were envisaged, however, due to the emergency situation in September 2024 at the 604th well of "Mustaqillikning 25 Yilligi" gas field, the second visit of "BEZOPASNOST' I KONTROL" LLC specialists to perform biomonitoring and the third visit of specialists from the Specialized Analytical Monitoring Centre to perform the industrial environmental monitoring planned for September 2024 did not take place due to the fact that environmental monitoring is carried out during the period of the Operator's routine activities, which is established by the approved Program for conducting industrial environmental monitoring and biomonitoring for 2024-2026.

The planned elimination of the consequences of the incident took place under the control of a specially created group. During the emergency work, necessary measures were taken to reduce the man-made impact on the natural environment of the Investment Block.

Considering the emergency situation, during elimination of which a large number of people and equipment were involved, it is considered inappropriate to provide an analysis of the state of the environmental protection system and flora and fauna in the autumn period due to strong man-made interference in the territory of the Investment Block.

It should be noted that the existing factors, if there were impacts on the environment, flora and fauna, will be visible in the spring period (growing, emergence from hibernation, arrival of nesting species) of 2025.

It can also be noted that keeping the Wildlife Observation Sheet on the Contract Area by the Operator's specialists shows a stable picture, since during the autumn migration period from August to November, rare species were also noted.





### **7. CONCLUSIONS**

Owing to implementation of environmental protection measures, as well as regular industrial environmental monitoring and process control monitoring and objects of the condition of atmospheric air, surface and groundwater, soil and subsoil, we can note in 2024 the absence of direct and tangible impact on the environment from the activities of SURHAN GAS CHEMICAL OPERATING COMPANY FC LLC.

The results of environmental monitoring in 2024 showed that the state of flora and fauna outside the areas allocated for construction work remains stable, no significant man-made or industry-related impact on the atmospheric air, aquatic environment, soil, flora and fauna of the contract areas has been identified.

During execution of field work at the investment block, no accidents or incidents involving employees of the Customer, Contractor and third parties have been noted. Final reports on Industrial Environmental Monitoring and Biomonitoring for 2024 have been approved by the Ministry of Ecology of the Republic of Uzbekistan.



И.И. Парманкулов 2024 r.









## **THANK YOU FOR ATTENTION!**





