



*Nature is
not a place
to visit. It's
our home.*

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ENVIRONMENTAL IMPACT



/ GRI 2-23 /

BUSINESS PRINCIPLE:
Environment

We have a systematic approach to environmental management in order to achieve continuous performance improvement.

To this end, we manage these matters as critical business activities, set standards and targets for improvement, and measure, appraise and report performance externally.

We continually look for ways to reduce the environmental impact of our operations.

2024

KZT **2.9** bln
environmental investments

Specific GHG emissions

66
tons of GHG/ thousand
tons of hydrocarbons'
production

Gas utilization

99.95%

14 years
of implementation of the
Biodiversity Action Plan at the
Karachaganak Field territory

Generated waste

58,124
tons

Recycled waste

36,562
tons

Water consumption

373,609
m³

Reuse of treated wastewater

32,234
m³

Why is it important to us? / GRI 3-3 /

Climate change is emerging as one of today's key global challenges, requiring a responsible approach from the business community. For KPO, climate action, sustainable development, and adherence to ESG principles are central to our operations. Our commitment to achieving carbon neutrality reflects our dedication to minimizing environmental impacts, ensuring long-term sustainability, and contributing to global climate protection efforts.

A significant milestone was the adoption in 2023 of Kazakhstan's National Carbon Neutrality Strategy by 2060, which outlines clear objectives and mechanisms for decarbonizing the country's economy. KPO actively integrates these strategic goals into corporate processes and planning, guided by our responsibility towards society and the environment.



Ruslan Mukangaliyev
Environment Controller

CLIMATE CHANGE AND ENERGY TRANSITION

The KPO Green Strategy is in line with the KPO-365 Strategy's objectives and the KPO Environmental Concept's principles.

The KPO Green Strategy covers five (5) key areas: GHG reduction, power strategy, offsetting strategy, water management and waste management.

- **GHG reduction**

In 2024 KPO has undertaken a number of engineering and feasibility studies on solutions for GHG emission reduction measures. Renewable energy measures were explored, and a wind measurement campaign was completed, and a concept selection phase was initiated for waste heat recovery at the existing GTG and installation of heat recovery boilers at the new GTG as part of the Karachaganak Gas Plant scope. Besides, the work on identifying measures and improving energy efficiency in the company is also ongoing. KPO actively improves its practices and implements modern advanced technologies to reduce methane emissions. Commitment to emissions reduction is integrated into business planning, production processes and reporting. In February 2024, KPO joined the OGMP-2.0 initiative having prepared the Multi-Year Methane Emissions Reduction Plan aligned with the UN Environment Programme. This initiative helps companies monitor and prioritize actions to reduce methane emissions. The maximum annual methane emissions by 2029 are set at 0.05 tonnes of methane per thousand tonnes of produced hydrocarbons.

- **Power strategy**

The main objective of the Power strategy is to ensure stable electricity supply that meets current and future KPO requirements as well as export obligations under the FPSA, considering the need to reduce greenhouse gas emissions, comply with regulations and implement the best available technologies. Intensive work continues to make final decisions on projects included in the KPO Power strategy.

- **Offset strategy**

Carbon offset projects play an essential role in the decarbonization process in the medium and long-term perspectives as other solutions gain momentum. Through the offset strategy, KPO intends to compensate the shortfall in GHG emission quotes in addition to GHG reduction projects based on the engineering solutions. In 2023–2024, the feasibility of offset projects in the West Kazakhstan Oblast was assessed, and potential opportunities in sustainable agriculture, i.e. improved pasture management and the use of zero tillage in agriculture, were identified.

- **Water Management**

Considering global and local water security risks, KPO aims to improve the efficiency of water resources utilisation by increasing the use of recycled water for technical needs of production facilities, introducing water-saving and digital technologies. The Aksai Sewage Treatment Plant Upgrade Project is assessed as one of

the major alternative long-term sustainable sources of technical water. The project passed the concept selection stage and currently its further implementation depends on the decision of local authorities.

- Waste Management**
 In 2024, a number of studies were conducted to find alternatives to upgrade the company's existing waste treatment facilities, reduce waste generation, and increase recycling and reuse through the implementation of advanced technologies and sustainable waste management. These activities will continue in 2025.

ENVIRONMENTAL MANAGEMENT APPROACH

ENVIRONMENTAL MANAGEMENT SYSTEM / GRI 2-23, 2-24, 3-1, 3-3 /

KPO has certified to use the Integrated HSE Management System certified to comply with

international standards [ISO 14001:2015](#), [ISO 45001:2018](#) and [ISO 50001:2018](#), as well as HSE Policy targeted to continuous improvement.

In 2024, KPO successfully passed the ISO 14001 audit that confirmed compliance with the requirements of the standard.

The key environmental commitments of the Company's HSE Policy include the following significant impacts:

- prevention of the environmental pollution,
- reduction of greenhouse gas emissions,
- biodiversity and ecosystems conservation,
- conservation of resources,
- continuous improvement in environmental performance.

In 2023, the KPO Environmental Concept has been developed, – the Company's strategic vision for achieving the environmental goals until 2037. The Concept has outlined the Company's activities in minimizing its environmental impact.

To achieve the set environmental targets within the established time frame, the KPO Environmental Work Programme was developed, where the activities and specific tasks for further ensuring the maximum possible environmental impact mitigation and sustainable development of the Company were defined.

As part of maintaining an effective environmental management system and to comply with the requirements of the new Environmental Code, KPO environmental procedures are regularly reviewed.

As required by the international standard ISO 14001: 2015, KPO continues to work on improving the environmental aspects identification process and environmental risks assessment.

Environmental aspects electronic management system

Environmental Aspects Register is developed and used by KPO to manage environmental aspects [EnvAR](#).

Environmental Aspects Register of the Company's divisions are annually reviewed and updated in line with the actual status. Based on the Company's divisions registers, the Consolidated register of the most significant environmental aspects is developed to devise additional activities/ control measures to reduce risks and improve the environmental condition. In 2024, the Consolidated Register of Significant Environmental Aspects of KPO covered the following aspects:

- 1) Pollutant emissions into the atmosphere and greenhouse gases,
- 2) Waste formation and management,
- 3) Detection of unauthorized waste disposal,
- 4) Treatment and discharge of domestic wastewater,
- 5) Generation and disposal of industrial wastewater,
- 6) Spills / leaks (hydrocarbons and/or chemicals),
- 7) Water resources consumption.

ENVIRONMENTAL COMPLIANCE

KPO runs its business in accordance with the environmental legislation of the Republic of Kazakhstan (RoK). KPO annually requests and obtains an Environmental Impact Permit (EEP) from the RoK Ministry of Environmental Protection. This permit sets the limits for contaminants emissions, discharges and limits for accumulation and burial of waste.

Two environmental administrative fines were filed in relation to the events of 2022–2023 for a total amount of KZT 908.62 mln following the unscheduled inspection carried out in the 2024. In 2024, the Company is appealing in court the decisions on imposing an administrative penalty for exceeding emissions limits in the amount of KZT 849.34 mln. and discharge limits in the amount of KZT 59.28 mln. The process of partial appealing the court decision that imposed an administrative penalty for exceeding pollutant discharge limits in the amount of KZT 50 mln is also ongoing. / GRI 2-27 /

Implementation of the Environmental Code

The 2025 Environmental Impact Permit for KOGCF facilities was obtained in 2024 as part of the Rok Environmental Code (EC) requirements. In 2024, the Plan for implementation of the Rok Environmental Code's requirements was 94% completed.

During the year 2024, as member of the working groups under the Foreign Investors' Council, Rok Ministry of Ecology and Natural Resources, Ministry of Energy, National Chamber of Entrepreneurs "Atameken" and the KAZENERGY Association, the Company took part in 147 meetings and commented and introduced proposals for 74 projects of the Rok laws and regulations in environment protection, as a result the following changes been made to corresponding Rok regulatory legal acts:

1. The Rok EC in accordance with the Law No. 121-VIII dated 08/07/2024. The deadline for providing financial support has been extended for 5 years, meaning that existing facilities shall provide financial support for the fulfillment of obligations to eliminate the consequences of its operation starting from July 1, 2029. In October, the Methodology for Determining the Amount of Financial Support was amended in accordance with the Rok Environmental Code.
2. The Working Group for review of the Sour Gas Processing Development Program (SGDGP) and its Guidance was approved by the Order of the Rok

Minister of Energy dated June 29, 2024, approval process was systematized.

3. A Working Group has been created to develop structural solutions and ensure a smooth transition to the Integrated Environmental Permit (IEP), as well as to address issues related to the suspension of environmental permits. The draft Orders for development of Process Emissions and Discharge Limits have been coordinated with other state authorities and anti-corruption expert review panel. In November, a round table was arranged for KazEnergy, operators and the MENR. As a result, 'NIT' JSC and the Committee for Environmental Regulation and Control of the RoK MENR were advised to work on eliminating the technical shortcomings of the e-Licensing System to ensure the IEP smooth issuance.
4. "The MENR supported the business in cancellation of amendments to the RoK Environmental Code, initiated by the deputies of the Mazhilis of the Rok Parliament, to return to damage calculation using the indirect method for category 1 and 2 Operators for compensating environmental damage from environmental pollution by excessive and unauthorized emissions.
5. In April 2025, the Head of State signed the new Water Code of the Republic of Kazakhstan, which aims to introduce new mechanisms for water conservation and water sources protection, the water resources management approaches with the priority on its protection, measures to prevent and eliminate harmful water effects, such as flood control measures, as well as stricter state regulation and control of water funds use and protection.
6. Discussion of the draft new Rok Tax Code. The draft law proposes to exclude retrospective fees/penalties in case of IEP revocation or suspension and not to apply increasing coefficients (2, 4, 8) to emissions from construction and installation works and reclamation and (or) liquidation works. Some amendments to the list of pollutants have also been proposed.

Environmental Public Hearings

/ GRI 2-29 /

In 2024, the Company held public hearings on application materials for obtaining the 2025 Environmental Impact Permit for KPO facilities located within the **KOGCF**. According to the Rok Environmental Code, the public hearings were held on 15-18 October 2024 by means of open meetings in 4 rural districts of the Burlin region (Uspenovskiy, Priuralnyi,

Zharsuatsky, Pugachevsky). 84 construction projects, 3 Emission Limits Projects, Waste Management Program, Production Environmental Control Program and Environmental Protective Measures Plan were presented for public consideration.

Information about the planned public hearings was brought for attention of the state authorities and the public through announcements at the Unified Environmental Portal, in a periodical printed publication (newspaper), TV channel and on bulletin boards of local executive authorities of administrative-territorial units.

All projects submitted for discussion at the public hearings in 2024 were endorsed by the state authorities and the public. The results of public hearings were reflected in the protocols of public hearings. A package of documents submitted for the public hearings, including the discussion results, are available on the website <https://ecportal.kz/>.

All projects submitted for discussion at the public hearings in 2024 were endorsed by the state authorities and the public.

Supplier environmental assessment

/ GRI 308-1, 308-2 /

Based on the Rok Environmental Code, KPO as an operator of the KOGCF and condensate export pipeline KPC Bolshoi Chagan-Atyrau facilities is obliged to obtain an Environmental Impact Permit, which also includes Business Partner-organizations engaged to perform works and to provide services on the territory of KPO facilities. Business Partners shall comply with the terms of the Environmental Permit conditions and bear responsibility for their non-compliance under the laws of the Republic of Kazakhstan.

Thus, since 2021, KPO has been continuously working to improve its engagement with suppliers. In the 2021–2022 period, the Business Partners’ control system has been implemented and further developed in 2023 and 2024.

In 2023, the Company’s HSE requirements reflected in Schedule D of contracts were revised. This has allowed proceeding with amendments to existing contracts upon which a number of suppliers are required to manage their own wastes generated within the KPO facilities area. Subsequently, all suppliers performing works at KPO facilities shall handle safe storage of waste at workplaces. While KPO will handle further collection and transportation of waste involving a specialized contractor.

In 2023, KPO has implemented a practice of limited-scope audits of Business Partners by means of the KPO Environmental Controllershship to check their compliance with terms of the KPO Environmental Permit. As a result of the audits, accounting systems for fuel consumption at stationary emission sources and Business Partners waste flows were improved. In 2024, internal environmental control system during works or operational environmental control is subject to the audits.

On 22nd December 2023, as part of raising the environmental awareness, improving the Environment Management System and fulfilling requirements of the contracts’ Schedule D, KPO held a workshop on familiarization with the new Rok Environmental Code’s requirements for the Environmental Engineers. The workshop was attended by representatives of the 57 Business Partners. The workshop provided attendees with detailed requirements of the new Rok Environmental Code, as well with better understanding of the Operator and Business Partners’ responsibilities on the environmental protection.

In 2024, the Company implemented procedural and organizational measures to upgrade the Waste Management System to handle waste generated from services provided by Business Partners under the contracts at the KPO facilities. This includes centralized collection of all waste by a single specialized waste management organization to ensure compliance with the Environmental Code, and to improve transparency and efficiency in waste management.

2024 ENVIRONMENTAL PROTECTIVE MEASURES PLAN / GRI 3-3, SDG 9.4 /

To achieve the set environmental goals, KPO annually develops Environmental Protective Measures Plans (hereinafter referred as the EPMP). EPMP focuses on ensuring environmental safety, improving environmental protection methods and technologies, ensuring rational use of nature and maintaining

compliance with the ISO 14001 and ISO 50001 international standards.

In 2024 KPO operated the business based on the issued environmental permits. The EPMPs were developed and approved for each of the Permits obtained.

Tab. 26. KPO 2024 Environmental Protective Measures Plans and Environmental Permits issued

#	2024 EPMP	Valid 2024 Permits	Permit Issuing Authority
1	KPO 2024 EPMP for KOGCF	Environmental Impact Permit (effective period: Jan1 to Dec 31, 2024)	Committee for Environmental Regulation and Control of the Ministry of Environment, Geology and Natural Resources of the Republic of Kazakhstan
2	KPO 2024–2030 EPMP for the KPC-Bolshoi Chagan-Atyrau export condensate pipeline (WKO)	2020 Environmental Emissions Permit (effective period: 01.01.2024 – 31.12.2030): 1. Air pollutant emissions; 2. Pollutants discharged with wastewater.	WKO Akimat, West-Kazakhstan Oblast Administration of Natural Resources and Nature Use Control
3	KPO 2024–2030 EPMP (Atyrau Oblast)	Environmental Impact Permit (effective period: Jan1, 2024 to Dec 31, 2030)	Atyrau Oblast Akimat, Atyrau Oblast Administration of Natural Resources and Nature Use Control

In 2024, the total actual costs of the environmental measures implemented at Karachaganak Field amounted to KZT 2.9 bln against KZT 2.6 bln planned and that is 111%.

The KPO 2024 EPMP implementation by sections is shown in Table 28.

Tab. 27. 2024 Environmental Protective Measures Plan Progress, % / GRI 3-3 /

#	Sections of Environmental Protective Measures Plan	KPO measures implementation, %:		
		KOGCF	KPC-Bolshoi Chagan-Atyrau export condensate pipeline (WKO)	KPC-Bolshoi Chagan-Atyrau export condensate pipeline (AO)
1	Air conservation	168%	100%	100%
2	Conservation and rational use of water resources	116%	N/A*	N/A*
3	Land conservation	100%	N/A*	N/A*
4	Flora and fauna conservation	100%	N/A*	100%
5	Production and consumption waste management	152%	N/A*	N/A*
6	Introduction of management systems and best safe technologies	100%	N/A*	N/A*
7	Environmental scientific research and design-survey works	N/A*	100%	100%
8	Environmental awareness and promotion	N/A*	100%	100%
	TOTAL:	KZT 2.9 bln (USD 6,286,170 mln)	KZT 5.3 mln (USD 12,626)	KZT 16.2 mln (USD 35,363)

* N/A – measures are not applicable.

The environmental effect from the implementation of environmental protection measures is presented in Table 29.

Tab. 28. Environmental effect from the implementation of environmental protection measures to reduce emissions and waste, 2024 / GRI 3-3 /

<p>Air emissions</p>	<p>The reduction in actual pollutant emissions into the atmosphere as a result of implementation of measures with the introduction of advanced technologies for 2024 amounted to 6,034 tonnes, including:</p> <ul style="list-style-type: none"> • Use of a surface pump to transfer product with high gas volume fraction during the well test resulted in reduction of emissions by 5,364 tonnes. • Use of hydrocarbon-based fluid for the reservoir operations (Lamix or Deisel) helped to reduce the amount of air polluting emissions by 670 tonnes.
<p>Water consumption</p>	<ul style="list-style-type: none"> • The volume of reuse of treated wastewater, including rain and melt water, for 2024 amounted to 32,234 m³, which led to a reduction in fresh water intake for technical needs from surface sources. Treated waste waters were re-used for the KOGCF technical purposes, as well as for dust suppression and drill mud preparation.
<p>Waste Management</p>	<ul style="list-style-type: none"> • In 2024, 561.293 tonnes of non-recyclable production and consumption waste were disposed by high-temperature incineration, including residues received after segregation of solid municipal waste, medical waste, dehydrated sludge from silt areas. This helped to reduce the volume of buried waste by 88%. • As a result of municipal waste segregation at the segregation plant, 134.567 tonnes of useful components (waste paper, plastic, glass and scrap metal) were extracted for subsequent transfer to specialized companies for processing and (or) reuse. This helped to reduce the volume of municipal waste by 15.5%. The volume of liquid waste processing equals to 10,888.42 tonnes. Treatment at the LTP helped to reduce the volume of waste by 95%. 1,641.5 tonnes of base oil (10,2% of the total mass of drilling waste processed at TCC) recovered during processing the 16,132.53 tonnes of oil-based drill cuttings and other industrial waste.
<p>Land reclamation / GRI 304-3, SDG 6.6, 15.1, 15.5 /</p>	<p>In 2024, land reclamation was carried out after the completion of construction work on 55.4 hectares area.</p>

ENVIRONMENTAL MONITORING / GRI 3-3, 413-1, SDG 3.9 /

KPO implements a number of environmental programs that cover all aspects of operational activities. One of the key programs is a Production Environmental Control (PEC) Program developed in line with the Rok Environmental Code to meet the following objectives:

- obtaining reliable data about the Company's emissions and impact of production activities on the environment;
- rapid and proactive response to emergencies;
- minimizing the impact on the environment and human health;
- communication to stakeholders (local communities, state regulatory authorities, partner companies) about the environmental activities of the Company and risks for population health.

As part of the PEC program, the environmental emissions such as air emissions, wastewater discharge, waste treatment, waste accumulation and disposal, and the quality of environmental components such as air, surface and ground water, and soil are monitored.

In 2024, the PEC monitoring of the environment components has demonstrated that concentrations of target substances were on a par with those observed in

previous years. No negative impact on the environment from the KOGCF operations was identified.

KPO regularly keeps the production environmental control over the environmental condition at the Field's waste disposal facilities. In 2024, no direct negative impact on the environmental components has been revealed as a result of monitoring of the ground water and soil at the Eco Centre's Solid Industrial Waste Burial Landfill and the Temporary Liquid Drilling Waste Storage Site, as well as in cells 35A and 35B. Quantitative control over the movement of waste is carried out to account for the volume of burial, as well as the volumes and time of waste accumulation.

Air quality monitoring is carried out through the collection and analysis of samples by the accredited laboratory as well as by 18 stationary automatic EMS's. To assess the quality of atmospheric air, sanitary and hygienic limits are used – maximum permissible concentrations (MPC). To determine the level of atmospheric pollution, the registered concentrations of monitored components are compared against the MPC and demonstrated in fractions.

In 2024, over 100 thous. samples were taken by the laboratory, about 115 thous. laboratory sample analyses and 28 thous. measurements were conducted as part of the PEC.

The Company pays special attention to protection of atmospheric air in the Field area, at the SPZ boundaries and in settlements adjacent to the Karachaganak Field.

Sanitary Protection Zone / SDG 11.4, 15.2 /

The current estimated Sanitary Protection Zone (SPZ) at the KOGCF is valid from January 1, 2018. In 2021, KPO successfully completed the relocation of environmental air monitoring stations commenced in 2018.

The relocation of these stations was performed due to the change of the Sanitary Protection Zone to ensure correct performance of the continuous air monitoring and to comply with the Rok legal requirements. The plot map of the KOGCF with SPZ marked, as of end 2023 is available for viewing on the KPO website in the section [Sustainability/Environmental monitoring/Sanitary protection zone](#).

In 2024, KPO has continued the implementation of the Project "Organization and improvement of the estimated KOGCF Sanitary Protection Zone", having completed "The first phase of planting the KOGCF SPZ and extending the SPZ boundaries". The aim of the Project is to take care of existing forest stands and to plant new trees, as well as to install information signs at the SPZ boundaries. In order to protect historical and cultural heritage sites from

potential negative impact, the Project also provides for the installation of relevant signages at the boundaries of the protected heritage sites. Earlier in 2019, KPO organized the large-scale archaeological research on this topic (see the details in the [KPO Sustainability Report 2019](#), pp. 85-88). / SDG 11.4 /

In 2024, the boundaries of the Sanitary Protection Zone were expanded. According to the project the total number of information signposts is 62. In 2023, 42 signposts and 8 boards were installed. The remaining 20 information signposts are expected to be installed during the project implementation (2025–2028). In 2024, no work was carried out, 2025 budget for installation of historical and cultural heritage site signs has not yet been approved by the PSA Authority.

In 2024, the Project on KOGCF ESPZ Development and Upgrade was updated due to changes in land use within the KOGCF ESPZ area and plans for construction of a new facility (Aksai STP water line – Konchubai pump station). In the period from 2025 to 2028, the planned forest belt locations will be corrected by relocating them to the reserve lands.

A consolidated layout plan of the SPZ development and landscaping facilities will be agreed with the stakeholders.

The total area of the sites planned for green construction for the entire project period will be 249.1 ha, of which 151.9 ha are new plants, and 97.2 ha – reconstruction of the existing ones.

Table 29. Key performance data for 2025–2028

Type of works:	Forest belts reconstruction	Planting of new forest belts	TOTAL:
Total area of forest belts, according to the 2021 Project, ha	97.2	151.9	249.1
Area covered in 2023-2024, ha	36.5	0	36.5
Remaining area to be covered after 2024, ha	60.7	151.9	212.6
Planned under the 2025 EPMP	16.2	9.6	25.8
Planned under the 2026 EPMP	26.4	20.4	46.8
Scope planned for 2027–2028	18.1	121.9	140.0
Total area of forest belts for the 2025–2028, ha.	60.7	151.9	212.6

The overall timeline of the entire Project implementation includes the period from spring 2023 down to 2028:

- 2022 – surveys, fieldwork and development of the Project’s work documentation.
- 2023 – demarcation of the SPZ.
- 2024 – Installation of guide posts at the boundaries of the protected cultural and historical heritage sites.
- 2023 – 2026 – forest belts reconstruction.
- 2025 – 2028 – establishment of new forest belts.

Construction of capital facilities in the process of project implementation is not foreseen. The work is being carried out by the contractor. The plot map “Key design solutions of the development and upgrade of the KOGCF ESPZ for 2023–2028” is available for viewing on the KPO website in the section [Sustainable development/Environmental protection/ Sanitary protection zone](#). Consolidated layout plans of the SPZ development and landscaping facilities were agreed with the stakeholders, economic organizations and agricultural producers.

Atmospheric Air Monitoring by automatic Environmental Monitoring Stations / GRI 413-1 /

18 stationary automatic Environmental Monitoring Stations are installed along the perimeter of the KOGCF and the SPZ (EMSs 001 – 018) integrated into a single automatic environmental monitoring system.

Four out of 18 EMSs are located in the Field and within the SPZ. As of the end of 2023, 13 EMSs are located at the ESPZ boundary: 006 – 018 EMSs; EMS 005 is located near the Aksai town.

Annual average concentrations of the monitored components recorded by the EMS in 2024 at the KOGCF SPZ boundary are shown in the table 30. The column ‘Actual annual average concentration’ shows the minimum and maximum average concentrations of the monitored air components recorded by each EMS.

Tab. 30. The annual average concentrations of the monitored air components recorded by EMS in 2024

Monitored components	Actual annual average concentration, mg/m ³	MPC one-time ⁹ , mg/m ³	Exceedance of MPCone-time*
H ₂ S	0 – 0.002	0.008	no
SO ₂	from 0.001 to 0.010	0.5	no
NO ₂	from 0.001 to 0.010	0.2	no
CO	from 0.1 to 0.4	5.0	no

*Criteria of air quality at the SPZ boundary is MPC one-time EMS are configured to give a signal when the MPC one-time is exceeded.

All the EMSs take measurement of the four main pollutants (H₂S, SO₂, NO₂, CO) on a continuous basis, i.e. 24/7.

According to the data received from EMSs at the SPZ boundary in 2024, the actual daily, monthly, quarterly and annual average concentrations of the monitored components did not exceed the established sanitary and hygienic limits.

Meanwhile, 8 cases of 20-minute exceedance in H₂S concentration were recorded during the year.

Pursuant to the requirement of the Rok Environmental Code (Sub-it. 8, It. 2, Article 184), KPO delivered notices regarding the exceedance recorded at the EMS-013,

EMS-009 and EMS-006 to the WKO Environmental Department.

It should be noted that no connection has been found between the exceedances recorded at the EMS-009, EMS-07 and EMS-006 and KPO field operations. At the time of the exceedances all KPO facilities were functioning in normal operation mode, no well flaring/clean-ups were performed. No malfunctions of process equipment, leaks or unauthorized emissions, emergency or scheduled shutdowns of the process were recorded. No direct H₂S sources were revealed at the KPO facilities. It is assumed that three cases of 20-minute exceedances, recorded by the EMS –013 on 27 August, could be related to a gas leak from the RBVS, pipeline No. 508.

⁹MPC one-time is a maximum permissible one-time concentration of a chemical substance (mg/m³) in the ambient air of settlements. This concentration shall not cause a reflex response in human bodies (holding of a breath, irritation of eyes, upper respiratory tract, etc.) in case of 20-30 min of inhalation.

Tab. 31. One-time MPC exceedances recorded by EMS at the KOGCF SPZ in 2024

EMS No.	Monitored components	MPC one-time, mg/m ³	Number of exceedances	Frequency ratio of MPC one-time exceedance
EMS-006	H ₂ S	0.008	4	1.75
EMS-009	H ₂ S	0.008	1	1.25
EMS-013	H ₂ S	0.008	3	from 1.25 to 7.25

Moreover, one case of H₂S exceedance was recorded by the EMS-005 located at the entrance to the Aksai town with MPC one time exceeded by a factor of 1.625 times.

No gas odour complaints from the local communities adjacent to the KOGCF were raised on the date the MPC exceedances were recorded.

Air quality data from all 18 KPO automatic EMSs are transmitted online to the West Kazakhstan Oblast Environmental Department via the Ecomonitor portal.

Atmospheric air monitoring at the Karachaganak Field's SPZ boundary

Along with the continuous monitoring of atmospheric air quality run by the automatic EMS, the accredited Contractor laboratory conducts air sampling at the KOGCF SPZ boundary, at 8 compass points (rhumbs). Sampling at the SPZ boundary is performed daily at the route monitoring posts¹⁰ with the following frequency:

- 4 times a day at the N, E, S, W sampling points;
- once a day at the sampling points of NE, SE, SW, NW.

Annual average concentrations of the monitored air components recorded at route monitoring posts at the KOGCF SPZ boundary in 2024

Monitored components	Actual annual average concentration, mg/m ³	MPC one-time, mg/m ³	Exceedance of MPC
H ₂ S	0.002-0.002	0.008	no
SO ₂	0.003 – 0.004	0.5	no
NO ₂	0.025	0.2	no
CO	0.438 – 0.450	5.0	no
CH ₃ SH	Not detected	0.006	no
CH ₄	from 1.104 to 1.124	50*	no

*The determined approximate safe level of impact. MPC for methane is not determined.

In 2024, over 44,000 air samples were collected and analysed for the content of the same components measured at the EMSs: hydrogen sulphide (H₂S); sulphur dioxide (SO₂); nitrogen dioxide (NO₂); carbon monoxide (CO). Additionally, air samples are analyzed for methane (CH₄) and methylmercaptan (CH₃SH).

In 2024, according to the results of air monitoring at eight route monitoring posts at the KOGCF SPZ no exceedance of MPC of the monitored components was recorded.

Annual average concentrations of the monitored air components at the SPZ boundary in 2024 are shown in the table below. The column 'Actual annual average concentration' shows the minimum and maximum average concentrations of the controlled air components per 8 points.

¹⁰A route monitoring post is designed for regular air sampling at the certain fixed locations (points) with portable equipment.

Atmospheric air monitoring in the villages adjacent to the Karachaganak Field / GRI 413-1 /

In six villages located along the perimeter of the field: Zharsuat, Zhanatalap, Dimitrovo, Karachaganak, Priuralnoye, Uspenovka, and in Aksai town, stationary air monitoring posts have been installed. Air sampling is carried out four (4) times a day (at 1, 7, 13 and 19 hours according to the State Standard) by the permanent personnel of the contracted laboratory, who reside in the villages. Approximately 52,000 air samples were collected and analyzed at the stationary posts in 2024.

Air samples are chemically tested in the Aksai laboratory for the content of five main components in accordance with the State Standard and ruling documents: hydrogen sulphide (H₂S), sulphur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), and methylmercaptan (CH₃SH). In addition, every 10 days the air is monitored for concentration of volatile organic components: benzene (C₆H₆), toluene (C₇H₈), xylene (C₈H₁₀).

Monthly air monitoring results are distributed to the villages for posting on the information boards and

monthly published on [the KPO web-site](#) and local print media (Burlinskie Vesti, Borli Jarsysy, Budni Aksaya). If any gas odour complaint is raised by someone of the community, an unscheduled air sampling is performed at the stationary posts.

In 2024, no MPC exceedances were recorded for the daily average concentrations of the monitored air components in the villages.

In 2024, 3 complaints with respect to gas odour were raised by the villagers living in proximity of the Karachaganak Field and in Aksai. The unscheduled air sampling was carried out in the villages, the analysis results of which showed that the concentrations of the monitored components did not exceed the established MPCone time. Each complaint from an initiator with respect to gas odour was addressed.

2024 annual average concentrations of air components monitored in the seven villages are shown in table 32. The column 'Actual annual average concentration' shows the minimum and maximum values of annual average concentrations of the controlled air components. Criterion for assessing air quality in settlements is MPC daily average.

Tab. 32. Annual average concentrations of monitored air components in the villages adjacent to KOGCF in 2024 / GRI 413-1 /

Monitored components	Actual annual average concentration, mg/m ³	MPC daily average ¹¹ , mg/m ³	Exceedance of MPC daily average
H ₂ S	0.001-0.002	0.008**	no
SO ₂	0.003 – 0.004	0.05	no
NO ₂	0.021 to 0.026	0.04	no
CO	0.424 – 0.445	3.0	no
C ₆ H ₆	0.163 to 0.171	0.3**	no
C ₇ H ₈	below MDL*	0.6**	no
C ₈ H ₁₀	below MDL*	0.2**	no
CH ₃ SH	not detected	0.006**	no

* Measurements recorded were below the method's minimal detection limit (MDL). MDLs for monitored components: C₇H₈ – 0.14 mg/m³; C₈H₁₀ – 0.14 mg/m³.

** MPCone-time. MPCdaily average for hydrogen sulphide and methylmercaptan is not established, therefore, MPCone-time is referred to for comparison purpose; MPCone-time is also applied to assess the content of benzene, toluene and xylene in the air as the frequency of components' sample collection and analysis is once in ten days.

¹¹ MPCdaily average – maximum permissible daily average concentration of chemical substance in the ambient air of settlements, mg/m³. This concentration shall not have direct or indirect adverse effect on human body in case of inhalation during indefinitely long-term period (years).

Why is it important to us? / GRI 3-3 /

Air pollution harms human health, affects food security, hinders economic development, leads to loss of biodiversity, contributes to climate change and degrades the environment that people rely on for their livelihoods. The United Nations recognize air pollution as one of the major threats to human and planetary health.

The KPO industrial complex operation is inevitably associated with the air pollutant emissions. Pollutants are generated on all process stages: production, preparation, storage and transportation of gas and condensate. Reduction of emissions, recycling of waste and application of new technologies remain the most important issues on the Company's agenda. The Company's mission in this matter is to minimize the negative impact of its activities.



Aidar Gizatov
Air and Greenhouse Gas
Emissions Section Head

AIR EMISSIONS

KPO manages air pollutant emissions based on the limits established in the Environmental Impact Permit.

To control compliance with the limits, the Company monitors industrial emissions. At the KPO facilities, the air emissions are mainly released from sour gas and mixture of formation fluids (MFF) flaring, fuel gas

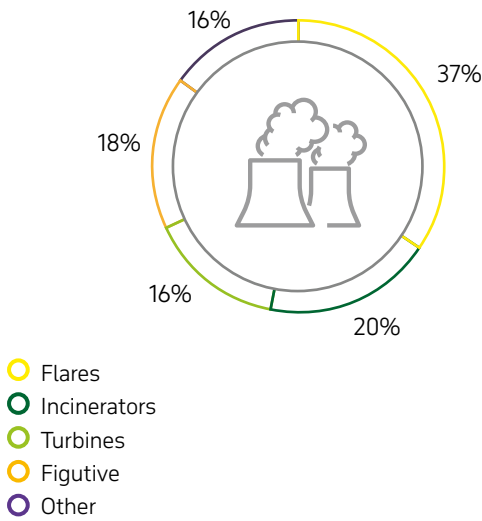
flaring in turbines, furnaces and boilers, from diesel fuel flaring in diesel-generator units. The sulphur dioxide, carbon oxide and nitrogen oxides are the main combustion products.

Across KPO the direct greenhouse gas (GHG) emissions are regulated under the national quotas trading system.

Tab. 33. Emissions management targets / GRI 3-3 /

Our 2024 targets	Target achievement status	Actions taken in 2024	Targets for 2025
Explore additional opportunities for implementation of Tail Gas Treatment Units	Completed by 50%	<ul style="list-style-type: none"> Alternative operating modes (changes in operating pressure) tested in field but yielded no improvement in SO₂ emissions. KPO in-house study completed indicating presence of very fine disulphides mist requiring new technology and/or innovative equipment to reduce SO₂ emissions Third party verification study to confirm/verify KPO in-house study. Investigation of new technology and flue gas desulphurization in progress. 	<ul style="list-style-type: none"> Third Party verification study of existing separation system. Inhouse & external study of technologies of removing SO₂ from the exhaust stream (post incineration gas) kicked off. Development of Feasibility Study for SO₂ emissions reduction by mid-year

Graph 20. Pollutant emissions in KPO by main air pollution sources, in 2024



In 2024, the total amount of air emissions was increased by 8% compared to 2023, totalling 6,198 tonnes. The increase in emissions in 2024 is justified by the increase of condensate production by 1%, and gas by 7% compared to 2023, and commissioning of the KEP-1A facilities. Table 34 shows data on permissible and actual KPO emissions for the 2022–2024 period.

Across KPO the direct greenhouse gas (GHG) emissions are regulated under the national quotas trading system.

Tab. 34. Permitted and actual volumes of pollutant emissions, 2022–2024 / GRI 305-7, SDG 3.9, 12.4 /

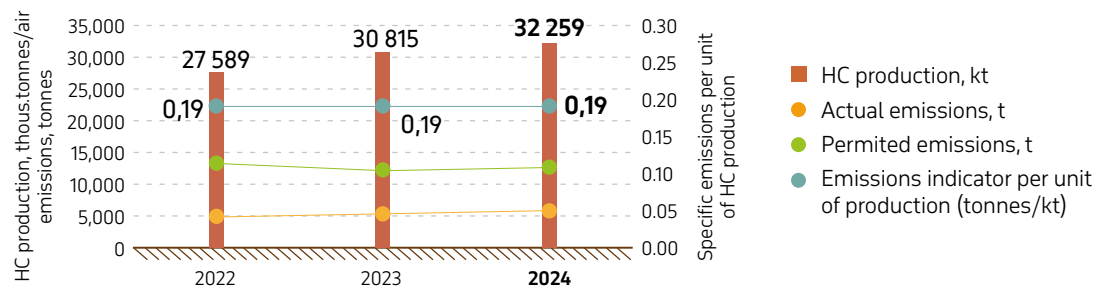
Annual volume of emissions by pollutants, in tonnes:	2024	2023	2022
Permitted emissions:	12,602	11,346	12,005
Actual, including:	6,198	5,765	5,236
Nitrogen oxides (NO _x)	1,505	1,362	1,182
Sulphur dioxide (SO ₂)	2,294	2,251	2,143
Carbon dioxide (CO ₂)	1,235	1,159	1,142
Volatile organic compounds	539	513	534
Hydrogen sulphide (H ₂ S)	3	3	3
Solid particles	578	441	198
Other	45	36	34

Note: Emission volumes data are provided in accordance with the data of statistical report «2-TP Air».

In KPO, emissions are calculated using the methods specified in MPE project and recommended for use in the Republic of Kazakhstan.

In 2023, specific emissions per unit of production amounted to 0.29 tonnes per 1,000 tonnes of hydrocarbons (HC) produced same as in 2023.

Graph 21. Volume of HC production and environmental emissions in 2022–2024

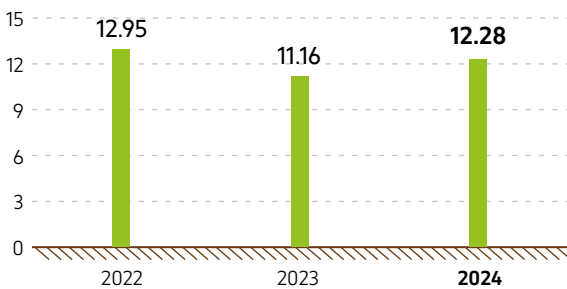


GAS FLARING / OG6, SDG 3.9, 7.3, 8.4, 12.2, 12.4, 12.5 /

In 2024, the total amount of gas flared reached 0.05% (0.05% in 2023) of the total volume of gas produced or 0.34 tonnes per thousand tonnes of produced hydrocarbons. Such a low flaring emission rate resultant from flaring testifies of high operational performance against the global industrial average rate of 8.77 tonnes per one thousand tonnes and European average rate of 2.23 tonnes per one thousand tonnes, as follows from the 2023 IOGP Report. This confirms the very high level of KPO for this indicator among the global and European oil and gas producers and makes Karachaganak the leading oil and gas condensate field in Kazakhstan in terms of gas utilization.

The slight increase in gas flaring volumes in 2024 comparing to 2023 is due to the commissioning and start-up of the 5th Gas Re-injection Compressor's turbine and the KEP-1A facility's high pressure flare.

Graph 22. Volumes of produced gas flared in 2022–2024 (mln m³)



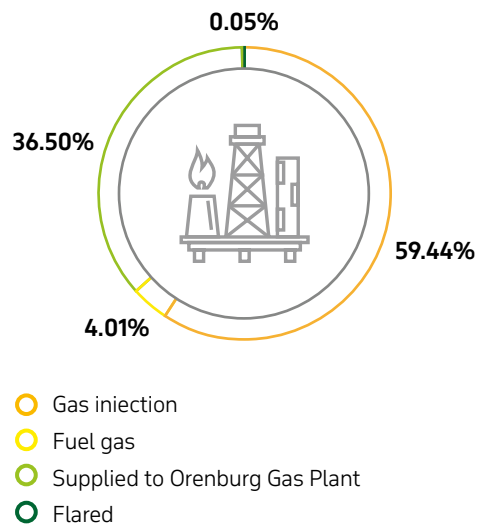
Gas Utilization

/ OG6, SDG 3.9, 7.3, 8.4, 12.2, 12.4, 12.5 /

Pursuant to the legislation requirements, KPO develops and approves with the Regulatory Authorities the Sour Gas Processing Development Programs.

In 2024, the KPO gas utilization rate reached 99.95% (99.95% in 2023). The performance target approved by the Rok Authority under the 2024 Associated Gas Processing Development Program is 99,85%.

Graph 23. Ga utilization and flaring in 2024



GREENHOUSE GASES

Direct Greenhouse Gas emissions

/ GRI 305-1, 305-7, SDG 3.9, 12.4, 13.1, 13.2 /

Direct greenhouse gas (GHG) emissions are regulated across KPO under the National Quotas Trading System. KPO obtained quotas for 2024 GHG emissions (CO₂) in the amount of 2,294,107 tonnes based on specific emissions indicators (benchmarks). In 2024, actual emissions have amounted to 2,118,011 tonnes of CO₂, which made 92.3% of the quota. In January 2024 the residual of the 2023 quota worth 788,530 tonnes of CO₂ was added up to the Company.

To ensure the level of GHG emissions is in compliance with the issued quota, KPO quarterly assess GHG emissions for carbon dioxide (CO₂) and methane (CH₄). The emissions were assessed using the calculation method and based on the Company’s operations data (in terms of fuel consumption and laboratory data on fuel composition) according to the Order No. 9 of the Minister of Ecology and Natural Resources of the Republic of Kazakhstan dated January 17, 2023 “On Approval of Greenhouse Gas Emissions and Absorption Calculation Methodologies”.

Rates used for analysis of the GHG emissions are calculated quarterly as per the laboratory data of the certified KPO Chemical Laboratory.

To convert the GHG emissions into carbon dioxide equivalent (CO₂-eq.), the global warming potential values were used according to item 4 of Decision of Conference of the Parties 6/CP.27 of November 17, 2022.

At the year-end, independent certified organization shall verify monitoring results and produce an Inventory report for the reporting period.

According to the verified GHG Emissions Inventory Report for 2024, the total volume of GHG emissions amounted to 2,139,054 tonnes in CO₂-equivalent, of which CO₂ contribution equalled to 2,118,011 tonnes of CO₂-equiv. (99%), CH₄ – 12,133 tonnes of CO₂-equiv. (0.6%), N₂O – 8,910 tonnes of CO₂-equiv. (0.4%).

Information on the dynamics of generated GHG emissions is provided in Table 35. The slight increase in GHG emissions (by 6%) in 2024 compared to 2023 is due to commissioning of the 5th Gas Re-injection Compressor and High Pressure Flare.

Tab. 35. Dynamics of GHG emissions generated from KPO production activities, 2022–2024
/ SDG 13.2.2 (C130202) /

Total volume of greenhouse gas emissions from stationary and fugitive sources, tonnes of CO ₂ equivalent					
From fuel combustion at stationary sources	From fuel combustion at flares and incinerators	Fugitive emissions	Total GHG emissions in 2024	Total GHG emissions in 2024	Total GHG emissions in 2024
1,980,948	149,145	8,961	2,139,054	2,012,982	1,851,066

Total volume of greenhouse gas emissions from mobile sources, tonnes of CO ₂ equivalent			
Flaring diesel and gasoline from mobile sources	Total GHG emissions in 2024	Total GHG emissions in 2024	Total GHG emissions in 2024
	1,683	1,680	1,750

The Methodology for calculating GHG emissions from fugitive emissions sources

To count the GHG emissions from fugitive emission sources, KPO uses its own methodology developed for efficient monitoring and approved by the Ministry of Ecology, Geology and Natural Resources of the Republic

of Kazakhstan in 2020. This Methodology has allowed gaining more accurate data of methane (CH₄) emissions from fugitive emission sources at KPO facilities and significantly minimize calculations uncertainty. The Methodology is applied during the annual GHG emission inventory process.

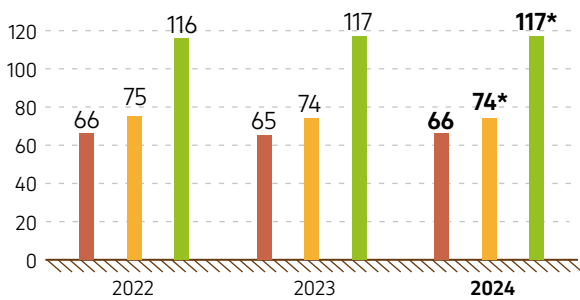
The Scope 2 emissions calculation has been conducted only for the purchased energy in the field facilities.

Specific greenhouse gas emissions

/ GRI 305-4, SDG 13.1 /

In 2024, the KPO specific indicator of CO₂ emissions totalled 66 tonnes of CO₂/thousand tonnes of produced hydrocarbons. Graph 21 shows the dynamics of specific GHG emissions comparing to the specific emissions data provided by the IOGP. The actual specific GHG emissions in KPO are lower than the European indicators by 11% and lower than the international indicators by 44%.

Graph. 24. Dynamics of specific GHG emissions per unit of HC production*, 2022-2024



- KPO data – tonnes of CO₂/thousand of HC production
- IOGP data – tonnes of CO₂/thousand tonnes of YC production (European indicators)
- IOGP data – tonnes of CO₂/thousand tonnes of HC production (International indicators)

Indirect greenhouse gas emissions

/ GRI 305-2 /

Indirect GHG emissions at KOGCF resulting from the consumption of imported electric power in 2024 account for an insignificant part (less than 0.1%), since the Company has a gas turbine power plant, the main purpose of which is to provide its own electricity to the entire production complex of the Field and nearby settlements.

These emissions are not subject to accounting and are not included in the reporting under the internal system of quotas for GHG emissions of the Republic of Kazakhstan. Information on them is provided only in reports to KPO Parent Companies. In 2024, the indirect GHG emissions at KPO amounted to 946 tonnes of CO₂.

* The data was sourced by Annual report of the International Associations of Oil and Gas Producers (IOGP) – “Environmental Performance Indicators – 2023 data”. The 2023 data was used for comparison purpose in 2024, as the 2024 IOGP Report was not available at the time this Report was prepared.



Why is it important to us? / GRI 3-3 /

KPO is one of the leading oil and gas companies of the Republic of Kazakhstan, being both supplier and user of fuel and energy resources (FER) and recognizes the need for the rational use and increase of the energy efficiency level in the Company.

Reinforcement of the carbon regulation policy and energy saving and energy efficiency requirements in Kazakhstan bring serious challenges for KPO. As both one of the large GHG emitters and the FER consumer in the country, the Company faces the necessity of the adaptation to new standards and regulations.

KPO is actively engaged in dialogue with shareholders, the state, the PSA LLP authority and other stakeholders to jointly define the strategy for future field development and create favourable conditions for technology investments, which are not paid off under current conditions but valuable in the long term.



Aigul Kireyeva
Sustainability Manager

ENERGY EFFICIENCY

KPO assumes responsibility to preserve favourable conditions for life-sustaining activity of future generations and make contributions in achieving the goal to decrease energy intensity and decarbonization of the economy of the Republic of Kazakhstan. Ensuring energy resources extraction, while transitioning to low-carbon technologies, is one of the challenges that we faced with. Our priority targets require continuing energy efficiency

activities and their assessment, including application of the best available technologies, implementation of fast-track projects, energy-efficient equipment and environmentally friendly materials.

In order to minimize energy efficiency risks and impact of the Company, we have set a number of targets. The results of their implementation are presented further in the text.



Tab. 36. Energy efficiency targets / GRI 3-3 /

Our 2024 targets	Target achievement status	Actions taken in 2024	Targets for 2025
Conduct a surveillance audit of the Energy Management System for compliance with the ISO 50001:2018 standard	Completed	A surveillance audit for compliance with the ISO 50001:2018 standard was successfully conducted in August 2024. The Company did not get any non-conformance as per the audit results.	Conduct a second surveillance Audit of the Energy Management System against the ISO 50001:2018 standard.
Conduct an annual energy analysis of the Company and continue monitoring of energy efficiency performance for equipment/processes that have a significant impact on KPO energy intensity	Completed	Company's energy review for 2024 was conducted. The Company's energy performance is regularly monitored (every quarter).	Conduct an annual energy review and continue monitoring of energy performance for equipment and processes that have a significant impact on energy intensity
Continue work on implementation of the activities scheduled for 2024	Completed	Activities scheduled for 2024 were partially implemented	Carry out scheduled activities and continue review and search for new opportunities to improve energy efficiency as part of the KPO Green Strategy

New targets for 2025

Conduct a mandatory energy audit of the Company in accordance with the Rok legislation to assess its current level of energy consumption.

Establish an Energy Efficiency Working Group consisting of KPO and parent companies' experts, for centralized coordination, process optimization, and accelerating the identification and implementation of opportunities to improve energy efficiency

ENERGY CONSUMPTION

KPO carries out an annual energy review and energy efficiency monitoring as part of the energy efficiency measures. Following the review, in 2024 KPO experienced less than 1% increase in energy intensity against 2023 that was due to start-up of the 4th Gas Injection Compressor in 2024.

In 2024, the energy consumption totalled 1,252,863 tonnes of coal equivalent compared to 1,189,548 tonnes of coal equivalent in 2023. Table No. 37 shows the energy consumption volumes broken down by energy type.

Tab. 37. KPO energy consumption in 2022–2024 / GRI 302-1 /

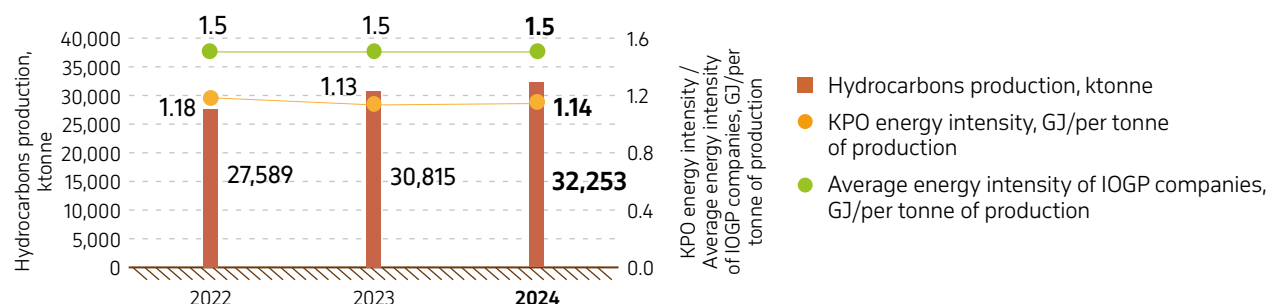
Type of energy	UOM	Energy consumption, physical units			Energy consumption, tons of oil equivalent (toe)			Energy consumption, GJ		
		2024	2023	2022	2024	2023	2022	2024	2023	2022
Fuel gas	thous.m ³	1,013,782	962,528	897,582	1,248,979	1,185,834	1,105,821	36,607,575	34,756,795	32,411,614
Electric energy (purchased)	MW/h	5,881	5,867	7,229	723	722	889	21,203	21,162	26,057
Diesel	m ³	716	700	760	903	883	958	26,453	25,881	28,079
Gasoline	m ³	228	233	233	251	257	258	7,359	7,533	7,562
Heating (in rented offices)	Gcal	14,032	12,948	9,448	2,007	1,852	1,351	58,815	54,282	39,598
TOTAL					1,252,863	1,189,548	1,109,277	36,721,405	34,865,652	32,512,909

In 2024, the KPO energy intensity indicator was 1.14 GJ /tonnes of hydrocarbons, which was below the average energy intensity indicator of the companies that submitted their reports to the IOGP¹² (1.5). The outcomes of this comparison analysis provide the basis for identifying areas of significant energy

consumption and possibilities for improving Company's energy characteristics, and determining energy policy, setting efficiency goals and targets and working out energy saving and energy efficiency measures.

/ GRI 3-3 /

Graph 25. Dynamics of energy intensity, 2022–2024 / GRI 302-3 /



¹² Data source: Annual reports of the International Association of Oil and Gas Producers (IOGP) – "Environmental Performance Indicators – 2023 data". For comparison purpose, the 2023 data are used in 2024, as 2024 IOGP Report was not issued at the time this Report was prepared.

ENERGY MANAGEMENT SYSTEM / GRI 3-3 /

The ISO certification contributes to enhancement of the KPO reputation as a reliable partner to the Republic of Kazakhstan that takes appropriate actions to meet both regulatory requirements and international standards.

In August 2024, KPO successfully completed the surveillance audit against the ISO 50001:2018 standards. Following the audit, the KPO Energy Management System was recognized as corresponding to the international standards.

In accordance with the ISO 50001:2018 requirements, KPO Energy Policy was integrated into the HSE Policy to be used as the guiding principles to determine and evaluate the energy efficiency goals and targets. KPO Integrated HSE Policy is an integral part of the long-term field development plan and contributes

to achievement of strategic goals and targets of the Company. / GRI 2-23 /

KPO supports a trend on personal approach to eco-friendliness, green thinking and conscious consumption. Company has implemented and apply the "Green office" concept to ensure more efficient application of the existing procedures of environmental and energy management.

KPO Green Rules focus on driving forward the personnel's willingness to change and be inspired to take action and reduce not only individual but also Company's impact on the environment. These Rules contain clear and simple instructions for all KPO and contractors' personnel and visitors on how to contribute to the improvement of the environment.

ENERGY EFFICIENCY ACTIVITIES

In 2024, KPO continued implementation of scheduled activities in accordance with the Energy Saving and Energy Efficiency Plan. The Energy audit being carried out every five years is planned for 2025. In accordance with the approved Plan for Energy Saving and Energy Efficiency improvement the following activities were completed in 2024:

- The work continued on replacing lamps with LED ones at production facilities and utilities areas. 423 lamps were replaced in the Company facilities in 2024. The estimated savings in electrical power consumption per year from the replacement of the lamps was about 78,590 kW*h. In the period of 2020–2024, 8,202 lamps were replaced and around 1,346,755 KW/h saved.
- The work continues on implementation of the Green Office Project in KPO offices aimed at energy and water saving, as well as refusal from plastic disposable tableware.
- KPO process facilities were assessed against the Best Available Technologies (BAT) requirements in the field of energy saving and energy efficiency. Based on the assessment results, recommendations have been developed to bring KPO facilities into compliance with the BAT requirements currently in force in Kazakhstan.

- The opportunity of using renewable energy sources for power supply to buildings was assessed. One of the options considered was allocating a budget for implementation of a pilot project involving installation of solar panels to supply electricity to the emergency response station.
- A feasibility study of the GHG reduction opportunities for offset projects was carried out.
- This year, 73 employees have been trained on various topics related to energy saving, sustainable development, carbon neutrality and other aspects of energy efficiency.

Also, in 2024 as part of the Green Strategy, a number of studies were carried out, variety of options evaluated for achieving Energy concept goals, in particular, options of implementing energy efficiency activities were reviewed, including the use of BAT and installation of energy saving equipment.

PROMOTING ENVIRONMENTAL AWARENESS AND CULTURE

"Green thinking" is actively promoted amongst KPO and contractors' employees. Activities raising environmental awareness and culture stimulate more careful attitude to the Company resources and raise personnel loyalty to the introduction of green technologies and practices.

In 2024, KPO carried out a number of activities among KPO and Business Partners' employees as part of the Environmental Culture and Awareness Enhancement Program.

On 20th September 2024, [VII Uralsk Green Forum](#) dedicated to the theme "Climate change: Challenges and Prospects of Using Advanced Technologies" was held in Uralsk. The Forum was attended by officials of the President's Office, the Ministry of Ecology and Natural Resources and the Ministry of Energy, the WKO Akimat, members of the WKO Maslikhat, representatives of natural resources user companies, industry and specialized associations, agencies, experts, republican and regional media. As part of the Forum, awards were presented to Business Partner and KPO employees who had most distinguished themselves in the field of environmental protection and sustainable development.

Moreover, to identify, attract and promote the positive experience of eco-friendly traditions, customs, and practices of the families of KPO and Business Partners' employees, the company held a video contest "Ecology and My Family." Winners of the contest were awarded as part of the VII International Environmental Forum, Uralsk Green Forum.

The VII International Environmental Forum "Uralsk Green Forum" ended with a joint tree planting – a collaboration with the Forum participants and the "Solnechnyi Uralsk" Charity Foundation. The report is available at the link.

As part of the Environmental Culture and Awareness Enhancement Program, training videos were released on the Environmental Management System and Environmental Indicators for 2023. Over 1,700 employees completed the training.

In 2024, over 100 KPO employees took part in Uralsk and Aksai clean-up and improvement campaigns. Such campaigns promote reassessment of people's attitudes towards waste and minimization of its generation.

In November 2024, KPO participated in the **29th** UNFCCC COP 29 conference. As part of the COP 29, the International Methane Emissions Observatory (IMEO) presented its annual report, which recognised that the operators of the Karachaganak field, Eni and Shell, were awarded the highest Gold Award for their level of methane emissions reporting. In addition, KPO confirmed its compliance with the OGMP 2.0 Gold Reporting Pathway, bringing it closer to achieving the key 2025 goal of becoming an OGMP 2.0 Gold reporting standard.

Green Office Project

Since 2020, the Company has been launching the "Green Office" project, the goal of which is to create a conscious concern for the environment and to minimize the environmental footprint of the Company's offices.

In 2024, the following measures were implemented as part of the Green Office Project Implementation Plan:

- Installation of flow restrictors on faucets and reduction of water flow in faucets in the WC of some offices.
- Installation of sensors in all WC to switch on/off the lighting in the leased buildings, replacement of old meters with new ones, and continuous monitoring of meters and electricity consumption.
- Insulation of walls, replacement of windows with new ones, replacement of window seals and upgrading of heating systems and radiators to reduce heat loss.
- Amending new contracts to reflect water and energy conservation requirements.

As a result of the activities, consumption of disposable tableware was decreased by 44% compared to 2023 in the Company's offices rented in Uralsk and Aksai.

"Say No to Plastic Cups" video and "Green Office Project" video presentation were released as part of the Green Office project's informational support popping up on computer screens throughout the year.

Why is it important to us? / GRI 3-3 /

Ensuring access to safe water and sanitation is a human right.

Excessive and irrational water consumption can lead to impacts associated with the depletion of water resources and water shortage for industrial and economic needs, deterioration of aquatic ecosystems and decrease in the ability of water resources to naturally reproduce and purify.

The Company's target is to use water resources rationally with the aim to preserve them. KPO controls clean water use at the company by undertaking a set of measures on conservation of water resources and re-use of treated water, wherever possible.



Almagul Kaibaliyeva
Senior Water
Management Specialist

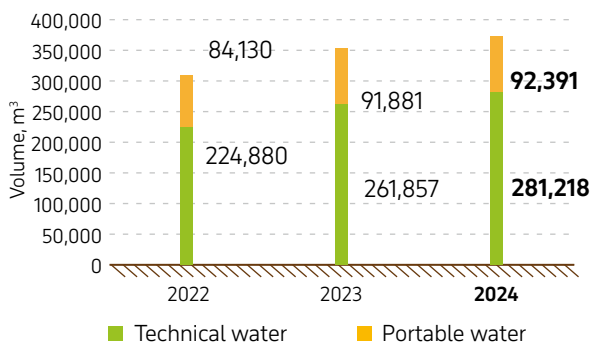
WATER CONSUMPTION AND WATER DISPOSAL / GRI 303-1 /

Protection and rational use of water resources is an important and priority task facing both all mankind and our company. Water is the source of life and a valuable industrial raw material. The results of our work on minimizing the risks of the Company's production impact on the use of water resources are presented below.

WATER CONSUMPTION / GRI 303-5 /

In 2024 total water consumption by Company was 373,609 m³, of which technical water – 281,218 m³, potable water – 92,391 m³.

Graph 26. Water withdrawal in KPO, 2022–2024
/ GRI 303-3, SDG 6.4.1 (CO60401) /



In 2024, KPO consumed water by 6.9% more compared to 2023. Domestic water consumption was slightly higher than in 2023 which was due to the increase of well operations and construction of new facilities.

In 2024, the volume of water consumed for production processes and for technical needs made up 196,488 m³.
/ GRI 303-5 /

There is no seepage flow into the Konchubai Gully. The flow only occurs during the spring-time snow melt and rains. In 2021, the combination of prolonged dry periods and little snow floods observed in the region has led to a critical decrease in the water level in the holding pond No. 1 at the Konchubai gully. In this view, in the past last two years, KPO has been carrying out a number of activities allowing optimization of technical water consumption and increase the reuse of treated wastewater, rainwater, and melt water. Besides, after conducting experimental filtration studies at wells, produced water was sent to operational facilities for reuse for technical needs.

From January 2022 to March 2024, water was not taken from Konchubai Gully for technical purposes to avoid its damage.

During the 2024 spring-time snow melt, the Konchubai gully reached the design water level, which allowed to meet the demand for technical water for production needs at KPO facilities. / GRI 303-1, SDG 6.4 /

KPO Water supply sources / GRI 303-5 /

Prior to 2024, the main source of water supply for KPO production needs was a holding pond No.1 at the Konchubai gully. For the domestic needs, KPO used water from the Zharsuat water intake. Sources of water supply for domestic and process needs at the pumping station in Bolshoi Chagan is the Serebryakovskiy water intake, while the Atyrau pumping station is supplied from the Kigach water intake.

According to Atueduct Water Risk Atlas source of Water Resources Institute <https://www.wri.org> the Karachaganak Oil Gas Condensate Field is based in area with no water shortage.

If necessary, in 2025, alternative KOGCF water supply sources (Jurassic and Akchagylskiy horizons) can be used for technical needs. Permit documentation for the groundwater extraction is going to be completed this year prior to the water intake's operation.

Technical water is used from Holding Pond No.1 of the Konchubai Gully, under the Special Water Use Permit issued by the Zhayik-Caspian Basin Inspectorate № KZ43VTE00079540 Series Kas. Zhayik (surface) dated 19.10.2021 (valid till 24.05.2025).

Treated domestic, rainwater and melt wastewater is reused for technical purposes, if the quality complies.

In 2024, the potable water was used for domestic needs of KPO facilities. By exception, due to the lack of alternative water sources, the potable water on Bolshoi Chagan's Pumping Station is used for technical purposes to refill fire water tanks and ensure the fire safety.

On potable water usage for the Karachaganak Field facilities, KPO is the secondary user under contract with AksaiGasPromEnergO LLP, a supplier of potable water from Zharsuat water intake.

Table 38 shows KPO water consumption breakdown by source.

Tab. 38. KPO water consumption in 2022–2024, m³ / GRI 303-3, 303-5, SDG 6.4.1 (C060401) /

#	Source	Unit	Water quality	2024	2023	2022
1	Zharsuat water intake facility (<i>household needs</i>)	KOGCF	groundwater, potable	91,119	90,257	82,404
2	Study of water holding pond #1 at Konchubay gully	KOGCF	surface water, technical	277,606	206,140	14,130
3	Ground water from Akchagylsky aquifer, wells No. W-4, W-9	KOGCF	ground, technical water	–	–	4,967
4	Technical water from Holding Pond No. 2	KOGCF	surface water, technical	–	50,920	172,450
5	Reuse of rainwater and groundwater after wells testing for technical needs of KOGCF	KOGCF	Reuse	12,181	10,445	30,816
6	Serebryakovskiy water intake facility	Bolshoi Chagan Pump Station (BCPS)	groundwater, potable	1,272	1,624	1,726
	<i>For household needs</i>			548	645	670
	<i>For production needs</i>			724	979	1,056
7	Kigach water intake facility	Atyrau OPS	surface water, technical	3,612	4,797	2,517
	<i>for household needs</i>			864	776	749
	<i>for production needs</i>			2,748	4,021	1,768

Note: water consumption is metered using meters with measurements entered in the measurements logbooks and further in the KPO water consumption metering database.

TREATED WASTEWATER DISCHARGES / GRI 303-2, 303-4, SDG 6.3 /

KPO uses special man-made facilities for collecting treated household/domestic water and disposing industrial wastewater and storm runoffs, and these facilities prevent contaminants from entering the soil

and groundwater as well as allow collecting the treated wastewater for their re-use for technical needs, thereby reducing the fresh water intake. Wastewater collection facilities by type are presented in table 39.

Tab. 39. Table 12 KPO wastewater collection facilities by types

Type of wastewater	Treated domestic wastewater	Industrial wastewater and storm runoffs	Rainfall and snow melt wastewater
Facility and location	<ul style="list-style-type: none"> • KCC holding ponds No. 1 and 2 • Evaporation ponds at Bolshoi Chagan OPS and Atyrau OPS 	<ul style="list-style-type: none"> • KPC sediment pond • Unit-2 sediment pond • Unit-3 collecting ponds (two) 	<ul style="list-style-type: none"> • KPC irrigation lagoons (two) • KCC irrigation lagoon • Unit-2 irrigation lagoon • Eco Centre holding ponds (two)

Produced water extracted with hydrocarbons and process wastewater are treated and injected into the deep-lying formations of the KOGCF Subsurface Wastewater Disposal Polygons Nos. 1 and 2. Wastewater injection is the international practice of disposing wastewater, avoiding the formation of salt-containing waste on the surface during the treatment. Due to the reliable water shutoff and soil properties, which are perfect for the injection of wastewater, the migration of wastewater into upper aquifers is ruled out.

In 2019, the Company has developed the Unified concept of options for the treatment of wastewater injected into the underground strata, alternative to the strip column at Unit-3. Two alternative options were suggested for consideration as most appropriate solution:

1. Disposal of wastewater from Unit-3 to Unit-2 using the Unit-2 production water treatment system (the existing H₂S strip column);
2. Disposal of wastewater from Unit-3 to the existing 14" condensate pipeline to KPC.

Due to optimization of resources and maintaining compliance with the Rok requirements, the Company stopped project development on strip column installation at Unit-3 and from 2020 has continued development of the design project on the second alternative option of the wastewater treatment at Unit-3 as defined by the Unified Concept Report.

In 2020, the project "Unit 3. Process Water Line Jump-Over of the KOGCF" was implemented, the aim of the project was to reduce the H₂S concentration in the injected wastewater by re-routing process water from Unit-3 to KPC via the existing condensate pipelines. The project includes installation of a jump-over line to reroute produced water from Unit-3, which is currently supplied to Polygon 1 RP-1 and RP-3 wells, to KPC via the existing condensate pipelines transporting unstable condensate from Unit-2 and Unit-3. Water will be separated and further supplied to the KPC existing produced wastewater system.

According to the Rok legislation, the volumes of discharged wastewater and contaminants are estimated and justified in the Company project documentation and regulated by special permits. Wastewater generated as a result of the KPO economic and production activities is not discharged into the natural water bodies.

In the production process of hydrocarbons, the separated formation water is pumped down to the underground water horizons (polygons). In 2024, this volume has made up 712,600.45 m³. / GRI 303-3, 303-4 / This water volume includes the formation water, the water formed during the gas dewatering and the water after the caustic neutralization. Water taken from the Konchubai Gully for desalting of crude oil and for the the reverse osmosis is also injected into the polygons. In 2024, this water was 17,68% of the total water injection.

Table 40 shows the KPO discharge volumes in 2022–2024 by wastewater types and receiving facilities.

Tab. 40. Total discharge volume and contaminants by wastewater type and receiving facility, 2022–2024, m³ / GRI 303-4 /

Receiving facility	Type of wastewater	2024		2023		2022	
		Discharge volume, m ³	Amount of contaminants, tonnes	Discharge volume, m ³	Amount of contaminants, tonnes	Discharge volume, m ³	Amount of contaminants, tonnes
Holding ponds	Treated domestic wastewater	20,603	10.024	27,484	15.20	42,412	29.44
Subsurface Wastewater Disposal Polygons	Industrial wastewater, process and produced wastewater	865,917	69,631	808,777	68,826	764,139	60,699
Terrain of Bolshoi Chagan OPS and Atyrau OPS	Rainfall and snow melt wastewater	3,450	0.996	4,501	2.33	3,168	1.81
Total discharge		889,970	69,642	840,762	68,843	809,719	60,730

Note: water discharge volume is metered, meters data entered in the logbooks and further in the KPO water consumption metering database. The amount of contaminants discharged is defined by calculation as the product of the actual concentration of the contaminant before the discharge and the actual volume discharged.

In 2024, the volume of discharged wastewater increased by 5.5% as compared to 2023. Of which, in 2024, the volume of injected industrial wastewater increased by 6.6% as compared to 2023. The increase in industrial wastewater in 2024 was due to the produced water growth in the hydrocarbons production. The volume of discharged treated domestic wastewater decreased by 25% as compared to 2023 due to suspension of treated domestic wastewater discharge from the bio ponds of Trains A and B to the KCC holding ponds 1 and 2 to accumulate water for technical reasons.

In 2024, the discharge of contaminants amounted to 69,642 tonnes (which was 1.1% more compared to 2023 – 68,843 tonnes). Only 0.01 tonnes were discharged over the limit. Insignificant excess volume of discharged pollutants was reported for domestic wastewater, discharged into the KCC Holding ponds

No.2, namely the exceedance was on nitrite nitrogen. KPO controls the content of pollutants in wastewater. According to the Maximum Permissible Discharges (MPD) limits project for 2024, the composition of pollutants in discharges includes the following: suspended substances, ammonium nitrogen, nitrates, nitrites, BOD 20, BOD 5, petroleum products, sulphates, chlorides, iron, anionic surfactants, phosphates, COD, dry residue, pH value, sulfides, hydrogen sulphide, methanol, copper, zinc, aluminium. The Company made necessary payments for the generated contaminants discharges in 2024.

In general, wastewater injection has no effect on the environmental components such as soil, flora and fauna, as wastewater is injected into effectively isolated deep horizons with high-mineralized groundwater that is not used for domestic and potable, balneological, process needs, irrigation or livestock farming.



REUSE OF TREATED WASTEWATER AND OTHER WATER

/ GRI 303-3 (2016), SDG 6.3 /

In order to reduce fresh water intake, for such KOGCF technical needs as drilling, making drilling muds, watering of planted trees, dust suppression on roads and constructed sites and filling fire tanks KPO uses treated domestic, production storm wastewater and storm runoffs.

The wastewater is re-used at the Company facilities in line with the 2023–2028 Operating Procedure.

In 2024, the Company reused 32,234 m³ of treated wastewater for technical needs, mostly for making drilling mud. Table 41 shows the activities that utilize treated wastewater.

Tab. 41. Reuse of treated wastewater and groundwater in 2022–2024, m³

	2024	2023	2022
The total re-used volume, including:	32,234	56,467	75,452
For technical needs of KOGCF production facilities	12,181	13,383	42,161
For drilling and drilling mud preparation	10,087	26,095	18,509
For irrigation, hydro tests, and replenishing of fire tanks	2,323	1,996	10,376
Dust suppression and irrigation	7,643	14,993	4,406

Note: the volume of reused water is determined indirectly in m³ (motor hours, tank truck volume, number of trips, pumping capacity, etc.) with the completion of a Control ticket and measurements entered into the Logbook.

INDUSTRIAL WASTEWATER MANAGEMENT / GRI 303-2 /

The Karachaganak Oil and Gas Condensate Field facilities KPC, Unit-2, Unit-3 generates the industrial wastes associated with oil and gas processing, which are subsequently injected into the deep water-bearing horizons at Wastewater Disposal Polygons N1 and N.2.

According to the RoK legislation, the volumes of discharged effluents and contaminants are estimated and justified by the Company project documentation and regulated by special permits.




Tab. 42. Targets in managing effluents / GRI 3-3, SDG 6.3, 6.4 /

Our 2024 targets	Target achievement status	Actions taken in 2024	Targets for 2025
<ul style="list-style-type: none"> Carry out workover on injection well RP-7 in order to increase perforation intervals in the Triassic Reservoir. 	Postponed	RP-7 workover performance is deferred to 2025. The reason of RP-7 workover deferral to 2025 is the equipment pending delivery.	Carry out workover of well RP-7 in 2025
<ul style="list-style-type: none"> Carry out a post-project analysis of design solutions implementation (Amendment 3 to the Wastewater Disposal Project) 	Completed	<p>The post-project analysis of design solutions implementation as part of Amendment 3 to the project for wastewater injection into the deep water-bearing horizons in terms of updating design parameters and EIA chapter was performed.</p> <p>The post-project analysis conclusion is published on the official eco-portal of CERC on 26 June 2024.</p>	–
<ul style="list-style-type: none"> Perform trial and verify throughput capacity up to 115 m³/h of produced water. 	Q2 2025	<ul style="list-style-type: none"> The procedure for trial of KPC Water Treatment Unit in segregated mode has been prepared and issued. It was agreed that the trial will be carried out after commissioning of the 4th sand filter at KPC: <ul style="list-style-type: none"> The sand filter was installed on 31.08.2024 Commissioning is planned in 2025 	To carry out KPC Process Water Treatment unit trial in segregated mode with the total injection rate up to 115 m ³ /h in order to verify that this mode is generally feasible.
<ul style="list-style-type: none"> Obtain a licence for geological survey of the Jurassic ground water. Conduct prospecting and assessment work for groundwater. Compile a final geological report based on the results of prospecting and assessment works on the groundwater of the KOGCF. Present the geological report for approval of the State Commission for Subsoil Expertise Review. 	Completed	<ul style="list-style-type: none"> The licence for geological study of subsoil was obtained in 22.01.2024. Pilot filtration activities were conducted on wells 33RR and 36J in April-May 2024. The final geological report was compiled in June-July. On 15 October 2024 West-Kazakhstan subcommittee of the State Commission for Subsoil Expertise Review was held, where usable groundwater reserves at the KOGCF Jurassic ground water reservoir were approved in the amount of 900 m³/day under the category C1. 	<ul style="list-style-type: none"> Prepare a periodic report on geological study of subsurface resources Provide the periodic report to Geology Committee
<ul style="list-style-type: none"> Obtain a Special Water Use Permit for Jurassic wells. 	Not completed	An application for a Special Water Use Permit for Jurassic ground water reservoir production from wells J1 and J2 will be submitted after completion of wells drilling.	<ul style="list-style-type: none"> To drill wells J1 and J2 in 2025. Obtain Special Water Use Permit.
<ul style="list-style-type: none"> Take a Final Investment Decision on the project of water supply from Aksai Wastewater Treatment Plant. 	Not completed	The documents package has been prepared for Projects Value Assurance workshop required prior to taking a Final Investment Decision. Further works were suspended pending approval of the republican budget for the Aksai Wastewater Treatment Plant upgrade	<ul style="list-style-type: none"> Obtain confirmation from Akimat on budget allocation for Aksai Wastewater Treatment Plant upgrade. Hold the Projects Value Assurance workshop required prior taking a Final Investment Decision.

Managing produced and industrial effluent water is one of the key challenges faced by KPO in the Karachaganak field.

KPO's industrial water management strategy consists of implementation of a portfolio of interconnected projects aimed at removal of production restrictions in terms of produced water handling as well as ensuring personnel safety, asset integrity and environmental compliance.

Waste water disposal at Polygons N1 and N.2 is performed in accordance with "Addendum No. 3 to the Project for injection of the Karachaganak industrial wastewater into deep water-bearing horizons on adjustment of the design parameters and Environment Impact Assessment (EIA) section". In 2022 this document was agreed in accordance with the RoK regulations requirements by the Department of the Industrial Safety Committee as well as a positive conclusion on EIA section was received from the Committee for Environmental Regulation and Control.

In accordance with Addendum No. 3 to the Injection Project the design parameter, in terms of industrial wastewater injection volume at Polygon N2, was increased from 2023 until to the end of the Polygon operation in 2037 up to 1,100 thousand m³ per year, as well as the implementation of technical measures to increase the potential of the injection well stock through additional perforation of target and prospective injection intervals and hydraulic fracturing.

In 2024 in accordance with the requirements of the RoK Environmental Code and the "Rules for conducting of post-project analysis and forms of conclusion on post-project analysis results" for "Addendum No. 3 to the project for waste water injection into the deep water-bearing horizons on adjustment of design parameters and EIA section" the post-project analysis of design solutions implementation was performed and a Conclusion was developed by the author of the design project. This Conclusion was posted at the electronic portal of the Environmental Regulation and Control Committee to the RoK Ministry of Environment and Natural Resources.

Managing produced and industrial effluent water is one of the key challenges faced by KPO in the Karachaganak field.

Activities on upgrade of a caustic neutralisation unit have been in progress since 2022; major construction works have been completed by the end of 2024 and commissioning was being carried out; ready for start up is planned for the Q1 2025.

As part of the implementation of the design solution and in order to increase the perforation intervals in the Reservoir II, the workover of the well RP-7 planned in 2024 was deferred to 2025 due to equipment pending delivery.

Tab. 43. Industrial wastewater management projects, ongoing in 2024. / GRI 303-2 /

Project	Business driver	Note
Upgrade of a caustic neutralisation unit	Safe operations	Implementation of the project will provide improvement of the caustic neutralization process. Automation of the process will allow to reduce the risks for personnel exposure to toxic agents. it is important to note, that the upgraded Caustic Neutralisation Unit project will be able to partly utilize the Reverse Osmosis water which otherwise would have been disposed.
Upgrade of sand and guard filters	Maintaining production level	Upgrade of sand and guard filters will allow KPC to achieve water treatment capacity up to 115 m ³ /d.
Technical Water Supply from the Aksai Wastewater Treatment Plant	Maintaining production level	The project will enable to obtain an alternative long term sustainable technical water source. A Feasibility Study has been conducted by KPO for supplying technical water to the Field units after Aksai Wastewater Treatment Plant upgrade by the Akimat. KPO project implementation has been temporally postponed awaiting Akimat confirmation on allocation of the Republican budget for Aksai Wastewater Treatment Plant upgrade project in 2025.

Why is it important to us? / GRI 3-3 /

If handled unsafely, hazardous production waste, and its storage and burial sites, pose threat to the environment and cause pollution of air, underground and surface waters, soil and vegetation, which may have a negative impact on the environment and the health of people.

KPO carries out complex work to prevent negative impact on the environment, i.e. carries out burial and accumulation only in the arranged waste storage sites, monitors the prevention of excess burial and accumulation of waste, as well as the timely removal of waste from accumulation sites.



Anara Kamayeva
Waste Management Specialist

WASTE MANAGEMENT

/ SDG 3.9, 6.3, 12.4, 12.5 /

Waste handling in KPO is focused on reducing real and potential hazards that production waste, generated by the Company may pose to people and the environment.

Our target is to treat and recycle waste at our facilities, cut down waste transfer to landfills, reduce negative impact from burials, as well as to research and apply new methods and technologies.

As per the working monitoring program, KPO performs regular production environmental control (PEC) over the environmental conditions at the waste burial and accumulation sites in the field.

In 2024, the monitoring did not reveal direct negative effects on the environmental components. As part of the PEC, quantitative control is exercised over the movement of wastes to account for the burial volumes, as well as the volumes and time of waste accumulation. / GRI 306-1 /

The results of our work to minimize the risks of the Company's production waste impact on the environment are presented below in the table and further in the text.

KPO processes related to production, processing and transportation of raw materials, as well as the use of special equipment, materials and other required resources, inevitably involve generation of waste.

Measures taken by KPO to reduce the volume of generated waste, to ensure compliance with environmental safety rules during the accumulation, collection and transportation, segregation, reuse, recycling, treatment and reduction of waste, including reducing their hazardous properties, as well as environmentally friendly burial – all this enables to significantly mitigate the adverse impact on people and the environment. / GRI 3-3, 306-1 /



Tab. 44. Targets in waste management / GRI 3-3, SDG 12.4, 12.5 /

Our 2024 targets	Target achievement status	Actions taken in 2024	Targets for 2025
Ensure implementation of activities scheduled for 2024 as per KOGCF Waste Management Program, and as per the Waste Management Programs for Bolshoi Chagan OPS and Atyrau OPS.	Completed	All activities scheduled for 2024 in line with the Waste Management Program were implemented throughout the year.	Ensure implementation of activities scheduled for 2025 as per the KOGCF Waste Management Program, and as per Bolshoi Chagan OPS and Atyrau OPS Waste Management Programs.

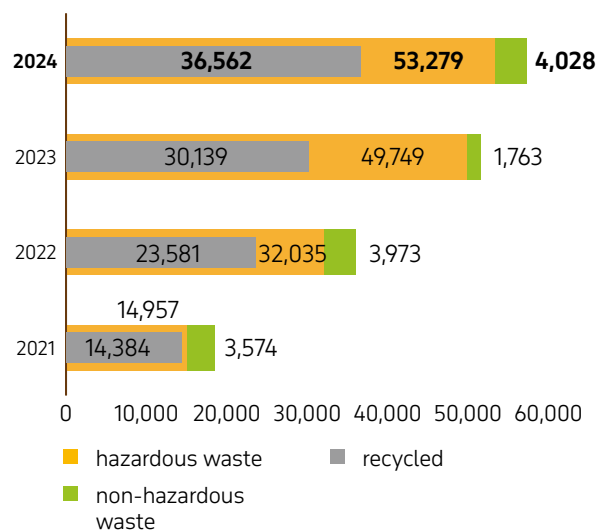
The KPO Waste Management Program for 2024 provides indicators and measures to gradually reduce the accumulated and generated waste volumes and level of hazardous properties. The Company applies the following waste management methods:

- waste recovery to process stream;
- waste treatment at the Eco-Centre facilities;
- waste burial at the Eco-Centre facilities;
- waste handover to specialist contractor organizations for further processing, reuse or destruction. / OG7 /

In 2024, the total amount of waste generated at KPO facilities was 58,124 tonnes. Compared to 2023, the volume of waste in 2024 in KPO increased by 5,737 tonnes, which was mainly due to the increase of well operations, and the new development projects. Graph 26 shows all types of waste generated in KPO.

According to the Unified Republican Form of the waste information reporting system, the total volume of waste generated in 2024 included both wastes generated and treated.

Graph 27. Quantity of waste generated at KPO facilities in 2021-2024, tonnes / GRI 306-3 /



Note.: The municipal waste is not accounted for in this calculation due to their insignificant quantity (below 6%) compared to the production waste. The municipal waste is described further in the text in the waste handling methods table.

WASTE PROCESSING AND BURIAL / GRI 306-2, 306-4, 306-5 /

The Company production and consumption wastes are treated at the Eco-Center facilities or the waste management complex. The facility ensures cost-efficient and environmentally safe recycling and treatment of solid waste and fluids and is considered to be an example of the best drilling waste management practice in the West-Kazakhstan Oblast.

Drilling wastes are treated by means of technologies, which allow not only reducing their volume and hazards, but also recovering valuable components from them, and treating the waste for further reuse. Waste recycling back into production process exercised

by the Company is the best possible way to re-use the generated waste. The KPO Eco-Centre comprises five waste treatment facilities, as well as a Landfill for its safe disposal.

During 2024, all Waste Management Program (WMP) measures scheduled for 2024 including waste segregation, reuse, processing and reduction of their quantities and hazardous properties, were implemented throughout the year. During 2024 the following activities were implemented at the Eco-Centre:



Tab. 45. Eco-Centre facilities and recycling activities in 2024

Eco - Centre Units	Waste treatment activities in 2024
Thermo-mechanical Cutting Cleaning facility (TCC)	Owing to recovery technology of base oil and water from the treated oil-based drill cuttings, in 2024 the quantity of KPO buried waste was reduced by 18%. In 2024, 16,132 tonnes of waste were treated; 1,819 tonnes of base oil and water were separated.
General Purpose Incinerator (GPI)	Resulting from waste incineration in the GPI, quantity of waste was reduced by 88%. In 2024, 634.733 tonnes of waste were sent for incineration, following which 73.44 tonnes of ash were buried at the Eco-Centre Solid Industrial Waste Landfill.
Liquid Treatment Plant (LTP)	In 2024, 11,425 tonnes of liquid waste were treated. The process resulted in 10,888.42 tonnes of treated brines and muds, which were sent for re-use – preparation of drilling brines and muds.
Waste Segregation Unit (WSU)	In 2024, out of 867,417 tonnes of solid domestic waste, 525 tonnes were sent to General Purpose Incinerator for incineration, 117 tonnes, including waste paper, metal scrap, glass and plastic were sorted for handing over to the specialist organizations for treatment and reuse. 115 tonnes of solid domestic waste was handed over to specialized organizations for burial at the SDW Landfills. 242 tonnes of food waste was handed over to specialized organization for composting.
Solid Industrial Waste Landfill	At the end of 2023, 16 cells of the Solid industrial Waste Landfill were capped and closed.

In 2024, the Company continued to excavate wastes from the old Solid Waste and Spent Drilling Fluids Storage Site for further treatment at the Rotary Kiln Incinerator and burial at the Solid Industrial Waste Landfill. The waste is buried at the Landfill in compliance with the Rok environmental legislation.

In 2024, 3,538 tonnes were sent for treatment from the Solid Waste and Spent Drilling Liquids Storage Site. Processing of waste from the old Site is planned to continue in 2025. / GRI 306-4 /

Table 46 shows the waste handling methods used by the Company in 2024.

Tab. 46. KPO waste handling methods in 2024, tonnes / GRI 306-3, 306-5 /

#	Waste handling method	Generated hazardous waste	Generated non-hazardous waste	Municipal waste	TOTAL
1	Availability at the enterprise as at the beginning of 2024	364,798	23	23	364,844
2	Generated during the reporting year	53,279	4,028	817	58,124
3	Reused at the enterprise	4,491	568	0	5,059
4	Treated at the enterprise facilities	36,297	264	765	37,326
5	Incineration in General Purpose Incinerator (without energy recovery)	0.094	0.019	634.6	634.7
6	Burial at Solid Industrial Waste Landfill	22,404	6	0	22,410
7	Temporary storage of drilling liquid waste in Cells #35 A/B of Eco-Centre	5,570	0	0	5,570
8	Handed over to specialized contractor organizations	1,405	2,986	204	4,595
9	Availability in the enterprise as of end of 2024	380,203	235	1	380,439

Note: the amount of waste is defined by weighing of each batch of waste at the Eco-Centre weight scales prior to its transportation for treatment, segregation, removal, burial or other operations. Waste quantities are logged in the load supporting documents (control tickets, waste handover certificates) and further in the Company's waste accounting database.



The KPO waste is mainly produced during well drilling and workover activities. Whereby, depending on the type of the drilling mud used, the water or oil-based drill cuttings are generated. The solid and liquid drilling waste generated in 2024 amounted to 29,739 tonnes (79% of the initially generated waste, i.e., waste volume before treatment). Drilling waste volumes were significantly increased due to the growth of well operations.

Table 47 shows the main types of drilling waste broken down by handling methods. As table shows, only water-based muds and brines are subject to disposal at the Eco-Centre cells 35 A/B, and the water-based drill cuttings to be buried at the Landfill. Oil-based drilling cuttings are subject to burying after pre-treatment and extraction of the oil base. / GRI 306-5 /

Tab. 47. Waste generated from well operations by handling methods, 2021-2024 / OG7 /

#	Type of waste	Generated waste, tonnes			Handling methods
		2024	2023	2022	
1	Spent water-based drilling mud	53	579	1,154	Treatment at Liquid treatment plant (LTP)
		4,869	3,873	3,467	Temporary storage of drilling liquid waste (in Cells #35 A/B of Eco-Centre)
2	Water-based drilling cuttings	2,295	1,369	2,716	Burial
		0	98	0	Temporary storage of drilling liquid waste (in Cells #35 A/B of Eco-Centre)
		0	223	0	Treatment at Liquid treatment plant (LTP)
3	Spent oil-based drilling mud	1,749	2,596	1,257	Treatment at the Thermo-mechanical Cutting Cleaning facility (TCC) and Liquid Treatment Plant (LTP), heat treatment in the Rotary Kiln Incinerator (RKI)
		56	0	0	Handover to the specialized organizations
4	Oil-based drilling cuttings	16,634	15,779	5,760	Treated at the TCC with extraction of oil base, water and followed by the burial of the solid part, heat treatment in Rotary-Kiln Incinerator
5	Spent brines	3,392	2,931	3,022	Treatment at TCC and LTP, heat treatment in Rotary-Kiln Incinerator
		597	503	155	Temporary storage of drilling liquid waste (in Cells #35 A/B of Eco-Centre)
6	Oil cuttings	0	19	21	Heat treatment in the Rotary Kiln Incinerator, treatment at TCC
		94	0	0	Handover to the specialized organizations

Within the contract terms, the Company hands over part of the waste for recycling to specialized contractors, who make their own decision on further waste handling methods once the waste has been accepted from KPO, and report on its transfer to third parties on a quarterly basis. Depending on the type, specialized enterprises hand over the waste for treatment with subsequent production of consumer goods, demercurization, regeneration, thermal treatment, incineration, physical and chemical treatment, dismantling into component parts with further transfer to concerned enterprises as recyclables.

Based on Article 301 of the Rok Environmental Code that prohibits burial of waste plastic, plastic, polyethylene and polyethylene terephthalate packaging, waste paper, cardboard, paper waste, glass cullet at the Landfills, the Company carries out sorting and segregation of such waste engaging contractors that lease office buildings to the Company. These types of waste are then handed over to specialized enterprises to be used as recyclables. / GRI 306-4 /

For the whole period of the waste paper segregation from 2011 till the end of 2024, 1,000 tonnes of the waste paper had been collected and handed over to local enterprises to produce consumer goods.

The segregation of spent batteries was arranged in all company office premises. In 2024, 112 kg of batteries was collected. / GRI 306-4 /

Food Waste Treatment / GRI 306-4-c-ii /

In order to comply with the requirements of the Rok Environmental Code, during 2021–2022 KPO has implemented the most efficient way to handle food waste generated at the food facilities of the Karachaganak Field. The contract was signed for the biocomposting of food waste. In 2024, the Company handed over 337 tonnes of food waste from the food facilities of the Karachaganak Field to the food waste processing enterprise. The resulting biocompost is used in agriculture and forestry as organic fertilizers to restore and improve soil fertility.



Why is it important to us? / GRI 3-3 /

As an international oil and gas company, KPO makes great efforts to perform operations with minimal impact on biodiversity.

Since 2012, KPO has been monitoring the biodiversity to define the level of potential risks from its operational activities. In case of evidences that the Company's activities are having a significant impact on the environment in the West Kazakhstan region, the former would initiate monitoring to timely plan and implement activities required to preserve the ecosystems.

As part of the Biodiversity Action Plan, KPO carries out an assessment of the four main factors impacting the KOGCF biodiversity:

- Pollutant emissions;
- Physical impact (noise, light, vibration);
- Cattle grazing at KOGCF area;
- Mechanical impact (construction, pits, roads, etc.).



Nurgul Kuzembayeva
Operations Environment Manager

BIODIVERSITY

/ GRI 413-2, SDG 6.6, 11.4, 15.1, 15.5 /



Our 2024 targets	Target achievement status	Actions taken in 2024	Targets for 2025
<p>Carry out monitoring of fauna, including population of rare and endangered species (river beaver).</p> <p>Carry out monitoring of ichthyofauna and its food potential (the Berezovka River and Konchubai gully).</p>	Completed	<ul style="list-style-type: none"> • Monitoring of fauna species diversity within KOGCF, including population of rare and endangered species (river beaver), was carried out. <ul style="list-style-type: none"> • mammals; • birds; • amphibians; • reptiles; • A monitoring of ichthyofauna, plankton, and benthos was conducted at selected areas within the KOGCF in comparison with the previous studies. • KOGCF species diversity database was updated. 	Carry out the monitoring of fauna and laboratory analyses of soil and plants within the KOGCF.
Continue flora and fauna baseline studies along the KATS route.	In progress	Flora baseline studies were carried out along export pipeline KPC – Bolshoi Chagan – Atyrau route in Atyrau Oblast.	Carry out fauna baseline studies along the KATS export pipeline in WKO.

Karachaganak oil and gas condensate field (KOGCF) covers an area of more than 280 km². KPO shares the single territory with other users of natural resources, while it operates only on areas directly located under industrial facilities, pipelines and field roads.

Besides the KPO industrial facilities, there are other businesses deployed at the Karachaganak Field, which are either engaged in processing of some part of the raw product produced by KPO (such as JSC "Condensate") or provide maintenance services for the field and infrastructure facilities. Apart from KPO and third-party facilities, there are large areas in the field previously used as agricultural land and farming land plots. Until 1956 this area had been used for pastures and hayfields. After 1957, farmers started growing grain crops except the floodplains and slopes of the Konchubai and the Kalminovka gully, which remained as pastures. So far, the state reserve lands (SRL) prevail on the sanitary protection zone (SPZ) of the Karachaganak Field. However, some patches are still being used by farms.

Thus, the above factors create certain difficulties in identifying and delineating responsibility for potential negative impacts and often limit KPO ability to take practical actions for restoration of the environment and the biodiversity.

Nevertheless, KPO is aware that natural biodiversity is not subject to administrative and territorial divisions set up by humans and to preserve all the entire biological wealth of a certain territory and the fragile links in the chain of species interaction, all players must follow common principles and approaches. In this regard, Action of biological diversity within the contract areas is the subject of special attention by the Company.

KPO is aware that natural biodiversity is not subject to administrative and territorial divisions set up by humans and to preserve all the entire biological wealth of a certain territory and the fragile links in the chain of species interaction, all players must follow common principles and approaches.

Aiming to minimize impact on biodiversity in the Field, since 2012 KPO develops and implements the Biodiversity Action Plan (BAP) regardless that there are no particularly sensitive areas which require biodiversity monitoring. Biodiversity Action Plan is one of the measures used to prevent the disbalance of ecosystem and reduction of biodiversity; it's a risk-based assessment of KPO's presence in terms of its potential impact on environment.

BAP is developed in accordance with the IPIECA/OGP's 'BAP Instruction guidelines for Oil and Gas' and updated every three years. Also, the survey and monitoring frequency is set at regular intervals. As part of the BAP, the Company has developed guidelines for actions recommended for sensitive ecosystems in riverbank areas, along with the flora and fauna species database. The database is updated yearly upon completion of surveys.

As part of the BAP, KPO performs an analysis of factors impacting the Field's biodiversity.

Additionally, satellite images analysis is being conducted for KOGCF every 10 years to monitor the dynamics of changes in the ecosystems.

Export pipeline 'Karachaganak-Atyrau' (hereinafter as KATS) is one of the key facilities that support the Karachaganak field's development. The pipeline was put in operation in 2004, and its length is 635,5 km. In 2022 for the first time ever KPO developed BAP 2023–2030 for the territory located along the KATS pipeline route.

In 2023 and 2024 KPO carried out flora baseline studies along KATS route for the purposes of:

- Identification of priority (key) species of flora;
- Identification of indicator species of flora;
- Identification of factors impacting ecosystems along the KATS route;
- Selection of site locations and routes for further monitoring;
- Creation of flora database.

The KATS route runs all the way through the West Kazakhstan and Atyrau Oblasts, KPO has therefore decided to carry out the region baseline studies on a phased basis.

MONITORING OF BIODIVERSITY AT KOGCF / GRI 304-2 /

For 2024 reporting period KPO has performed the approved activities, planned in BAP for 2024–2026.

All BAP stages since 2011 are uploaded on KPO website www.kpo.kz in the section [Sustainable development / Environmental protection/Biodiversity / BAP](#).

The scope of work for 2024 included monitoring of fauna and ichthyofauna within the KOGCF, including laboratory studies on fish and shellfish from its water bodies.

The purpose of the monitoring was:

- obtaining data on terrestrial vertebrate species within the KOGCF in spring and autumn of 2024, comparing the data with previous studies.
- obtaining data on ichthyofauna and its food potential (plankton, and benthos) in the Berezovka River and Konchubai gully in 2024, comparing the data with previous studies. Berezovka River and Konchubai gully in 2024 and comparing the data with previous studies.

Fauna monitoring

The Field’s faunal complex belongs to the western steppe zoogeographical realm and has a distinctly steppe character.

The field survey was conducted during the spring and autumn periods, within and outside the KOGCF SPZ boundaries, on 17 walking routes and 5 monitoring sites (considering the flood situation and the maximum filling level of water bodies).

2024 monitoring confirmed presence of the following species within the field and adjacent areas:

- 11 species of herpetofauna.
- 174 species of ornithofauna, of which 9 are listed in the Rok Red Book.
- 27 species of mammal fauna, of which 2 species are listed in the Rok Red Book.

No visible changes occurred in mammal species composition within the field and adjacent territories over the 2012–2024 period. At the same time, a significant number of wild boar (*Sus scrofa*) encounters were reported in the spring of 2024, which is due to the severe flood events. Additionally, in 2024 and 2021, a high population density of the Siberian roe deer (*Capreolus pygargus*) was observed.

Colonies of the European beaver (*Castor fiber*) are found in water bodies across the entire KOGCF and its SPZ territory. The population size and the area occupied by beavers depend on the water level in the water bodies. In the spring of 2024, the water level in most of the water bodies within the KOGCF and its SPZ significantly increased compared to the spring level of 2021. The rise in water levels triggered the migration of beavers and their settlement in previously abandoned old colonies in areas that had no water in 2021.

The results of the monitoring of wildlife (terrestrial vertebrates), as well as the analysis of population size and species diversity of fauna conducted during the spring and autumn periods of 2024, did not reveal any negative impact from the KOGCF industrial facilities on the faunal complex of the surveyed area.





Monitoring of KOGCF ichthyofauna

The protective regime within the KOGCF creates favourable conditions for the development of fauna in areas not affected by the company's activities. The industrial facilities' operation is a source of disturbance for most animals. At the same time, large areas are preserved to provide habitat conditions for a significant number of species from the faunal complex. Currently, on the territory of the KOGCF, conditions have been created that are close to protected natural areas in a number of respects: livestock grazing, haymaking and hunting are not carried out, vehicle traffic is regulated, and there are no permanent human settlements. A significant area, covering various biotopes, is under in-house security.

Ichthyofauna monitoring

In 2024, second monitoring of ichthyofauna and its food supply potential (plankton, benthos) was carried out at selected sites of the KOGCF and its adjacent territory (Berezovka River and Konchubai gully) taking samples of tissues of aquatic organisms (fish, shellfish) and bottom sediments for chemical analysis.

Regular monitoring of ichthyofauna, plankton and benthos at selected monitoring sites on the KOGCF and adjacent territories allows to evaluate potential negative impacts from the production activities. The monitoring is conducted once every six years.

Compared to 2018, the species composition of ichthyofauna in 2024 remained largely at the same level.

In 2024, the levels of heavy metals in the tissues of fish and shellfish were below the limit at most sampling points. However, it is not possible to assess the accumulation of heavy metals in the tissues of shellfish from 2018 to 2024 due to insufficient data. For more accurate conclusions regarding the accumulation of pollutants and more objective assessment of the biological status of water bodies within the KOGCF territory, the studies will be continued.

Biodiversity Action Plan at KOGCF territory for 2024–2026

Along with conducted analysis of KOGCF and adjacent territories ecosystems' dynamic pattern, a BAP for conservation of biodiversity at KOGCF territory for 2024–2026 was developed in 2023.

The BCP for 2024–2026 identifies main aspects of KPO activities on conservation of biodiversity in this region.

Tab. 48. Biodiversity Action Plan stages for 2024–2026

Period	The Scope of Work	Purpose
2024	Fauna monitoring, studies of ichthyofauna and hydrobionts species diversity within KOGCF	<ul style="list-style-type: none"> • Determination of dynamic for fauna species diversity and population within KOGCF in comparison with the 2021 surveys. • Determination of dynamic for ichthyofauna and hydrobionts species and population within KOGCF in comparison with the 2018 surveys.
2025	Monitoring of flora and soil	<ul style="list-style-type: none"> • Study of vegetation condition. • Perform of analysis for contamination in soils and plants.
2026	Survey of insect species diversity within KOGCF	<ul style="list-style-type: none"> • Determination of dynamic for insect species diversity and population within KOGCF in comparison with the 2020 surveys.
2024–2026	Creation and support of geographic information system	<ul style="list-style-type: none"> • Creation of a geographic information system on biodiversity

Monitoring of biodiversity at KATS

/ GRI 304-2 /

During 2024 KPO has executed the pre-planned activities as part of the 2023–2030 BAP for the areas along the KATS export pipeline route.

The scope of work for 2024 along the KATS pipeline included baseline monitoring of flora along the KATS section located in Atyrau Oblast, including laboratory studies.

Baseline surveys of flora and vegetation along the KATS pipeline route within AO was conducted at various type points:

- points near water crossings;
- points designated to different ecosystems;
- points near monitoring stations as part of PEC.

Total 36 points (sites) were surveyed, where 85 plant species belonging to 62 genera were registered. A baseline vegetation survey along the KATS pipeline route within the WKO identified flora and vegetation impacts such as transport, mechanical, agricultural and residential.

Of the factors listed above, KPO activities include transport and residential impacts. Residential impact is insignificant due to the fact that the transmission lines and block valve stations were built long ago, and only routine maintenance of these facilities is currently carried out.

The impact of transport on the ecosystems of the study area is the most significant of all the impact factors. It should be taken into account that not only KATS security service constantly inspects the pipeline, but also the security service of the Karachaganak-Uralsk high-pressure gas pipeline and the Uralsk-Atyrau-Samara oil pipeline, the pipes of which runs parallel to the KATS pipeline.

The mechanical factor was given separately due to the construction of dams and protective barriers during the flood period in May 2024, as earthworks were carried out to build flood control dams, leading to the disruption of the soil-vegetation layer. Since floods can occur every year, this factor should also be monitored.

There are a large number of settlements along the KATS pipeline route within the Atyrau Oblast (the closest to the KATS route are: Yeltai, Yntymak, Yesbol, Orlik, Koktogai, Oteshkali Atambayev, Kenoris, Aktogai, Makhambet, Zhalgansai) whose residents are engaged in agriculture and cattle breeding. Their activities affect the structure and condition of the herbaceous communities of the area used: pasture, haying, ploughing, fertiliser application, etc. In areas with no cattle grazing, the condition of the vegetation is satisfactory.

Total **36** points (sites) were surveyed, where **85** plant species belonging to **62** genera were registered.

During further flora monitoring along the KATS route, it is planned to track changes in the species composition (quantitative and qualitative indicators) of indicator and key plant species in communities affected by the agricultural impact factor.

According to the monitoring results along the pipeline, no disturbance of the vegetation cover was observed. The soil above the pipeline has been overgrown with native species in almost all areas, and in some places even small shrubs, subshrubs and bushes are present, indicating the restoration of the area.

During further monitoring, KPO will track the nature of ecosystem change under the influence of individual transport, mechanical, agricultural and residential factors and their combination, which, if necessary, will enable the development of measures to reduce the impact of different land users' activities on the region's ecosystems.

Laboratory tests were carried out to determine plants contamination by sampling from each monitoring site.

So far, it is difficult to make conclusions about the relationship between the content of pollutants in soils and plants due to lack of statistical data.

The dynamics of pollutant levels in soils and plants will continue to be monitored with a frequency of once in 6 years, which will allow to collect statistical data and help determine the degree of impact or lack thereof on the ecosystems along the KATS pipeline.

As a result of the background studies, KATS flora database (Atyrau Oblast) was created.

The Biodiversity Action Plan (BAP) for 2023–2030 prepared for the territory located along the KATS export pipeline route, identifies main aspects of KPO biodiversity conservation activities in this region.

Tab. 49. Stages of the 2023–2030 BAP for the territory located along the KATS export pipeline route.

Period	The Scope of Work	Purpose
2023	Baseline surveys for species diversity and vegetation condition along the KATS export pipeline section located in West-Kazakhstan Oblast	Identification of priority (key) and indicator specie of flora and study their condition.
2024	Baseline surveys for flora condition along the KATS section located in Atyrau Oblast	Identification of factors impacting ecosystems along the KATS route.
2025	Baseline surveys for fauna species diversity along the KATS section located in West-Kazakhstan Oblast.	Identification of priority (key) and indicator species of fauna and study of their population status.
2026	Baseline surveys for fauna species diversity along the KATS section located in Atyrau Oblast.	Identification of factors impacting ecosystems along the KATS route.
2027	Creation of a geographic information system on biodiversity along the KATS pipeline route	Introduction of KATS pipeline route's biodiversity information into the KPO GIS
2028	Monitoring of the soil and vegetation cover along KATS section, located in West Kazakhstan Oblast	Identification of the pasture impact on soil and vegetation cover state
2029	Monitoring of the soil and vegetation cover along KATS section, located in Atyrau Oblast	



Key species control

As part of biodiversity assessment, KPO makes a considerable focus on monitoring of rare plant and animal species. The priority of a particular species in matters of biodiversity conservation is determined by the priorities of international and local legislation, sensitivity and resistance to impacts and significance of possible negative impact of the company activities on the environment.

The main key species considered during the research period from 1990 to 2023 are shown on the website www.kpo.kz in the section [Sustainable development/ Conservation of biodiversity/Significant species of flora and fauna registered at KOGCF area](#).

All these species also exist outside the KOGCF. It should be noted that presence, absence or number of these species within the field is not a direct indicator of environmental well-being of the area. The distribution of individual species may change due to both local and global causes (climate change, desertification, etc.) that are not related to KPO activities. At the same time, it is necessary to plan and organize production activities in a way not to cause any direct and indirect effects on the population of individual species, which are an important part of the biodiversity at the Karachaganak Field and adjacent areas.

In 2023 and 2024, during the baseline surveys performed along the KATS export pipeline route within WKO boundaries, five species of flora included in

As part of biodiversity assessment, KPO makes a considerable focus on monitoring of rare plant and animal species.

the Red Data Book of the Republic of Kazakhstan and the list of endangered species were registered:

Within WKO boundaries:

- Carnation andrzejowskianus (*Dianthus andrzejowski*)
- Woodland tulip (*Tulipa biebersteiniana*)
- Schrenck's tulip (*Tulipa shrenkii*)
- Fischer's star of Bethlehem (*Ornithogalum fischeranum*);
- White water lily (*Nymphaea alba*).

Within AO boundaries:

- Schrenck's tulip (*Tulipa shrenkii*)

The category of **key / priority** species includes the species whose study and protection are of high priority for the area. First, these are species listed in the Red Data Book, IUCN Red List, as well as species that are rare or sparsely distributed in the area, they are the most vulnerable, quickly react to changes in habitat conditions and, thus, show indicator properties, in this regard, key species should be monitored.



CASE STUDY:

Oil spill response methods Net Environmental Benefits Analysis

Issue short description:

Hydrocarbons production, processing and transportation operations always imply a certain probability of emergency situations associated with deviation from specified production characteristics. One of the elements of preparedness to respond to situations that differ from the normal operation of oil and gas fields is the development of a system for early planning of actions aimed at both preventing and eliminating any emergency situations.

Considering that KPO's in-field and export pipelines intersect with various inland bodies of water located in the territories of the West Kazakhstan and Atyrau regions, the company carefully plans the actions that will be taken in the event of accidents on these pipelines by developing and maintaining Oil Spill Response Plans.

One of the elements of oil spill preparedness planning is the early selection and assessment of optimal oil spill response methods based on the Net Environmental Benefit Analysis (hereinafter referred to as NEBA).

Currently, several by-laws have been introduced in the Republic of Kazakhstan, the requirements of which are aimed at determining the procedure for selecting, coordinating and making decisions on NEBA.

Guided by the requirements of the Republic of Kazakhstan regulatory acts and following the practice of continuously improving the quality of environmental management of production activities, KPO conducted research in 2024. This resulted in the Republic of Kazakhstan Ministry of Ecology and Natural Resources Committee for Environmental Regulation and Control approving a report on optimal methods for oil spill response based on the net environmental benefits analysis of KPO's main and in-field pipelines.

The above report will be part of KPO's Oil Spill Response Plans.

Objective:

The range of issues included in the analysis varies significantly from country to country. In Kazakhstan, these issues are regulated by the «Rules for determining, approving and deciding on the choice of optimal methods for oil spill response at sea, inland waters and in the protective zone of the Republic of Kazakhstan based on the Net Environmental Benefits analysis» dated 09/02/2021 №353.

NEBA is used in planning actions in case of an emergency oil spill, as well as during response activities, when NEBA is used to ensure correct understanding of the prevailing conditions. By choosing the optimal oil spill response (OSR) methods in advance, it is possible to ensure a comprehensive study of OSR methods for various scenarios, considering the impact of each method on environmental components.



Decisions / actions:

The International Association of Representatives of the Oil and Gas Industry on Environmental and Social Issues highlights that there is no single tool or methodology of NEBA suitable and or universally be acceptable in all situations, due to the wide range and scale of possible oil spills scenarios, various conceptions about the value of environmentally sensitive areas and socio-economic facilities, as well as the real conditions at the oil spill response site.

The NEBA process provides an assessment of the potential environmental impact sufficient for the parties to compare and select preferred combinations of oil spill response methods.

Due to the fact that various natural and technological factors can cause oil spillage into water bodies, the NEBA report considers full transverse rupture of the pipeline at all areas at intersections as the worst possible scenario.

Results:

The NEBA report provides assessment of information on the natural environment, flora and fauna adversely affected by emergency oil spills, the possibilities and limitations of OSR methods, in order to minimize the harmful effects on the environment in the event of potential occurrence of emergency oil spills at the intersections of in-field pipelines and KATS export pipeline with various inland bodies of water located on the territories of West Kazakhstan and Atyrau regions.

The report examines eight scenarios of emergency oil and condensate spill at the water crossing sites: for KATS – three sections of crossings over the Zhaiyk, Barbastau and Kursai rivers, for in-field pipelines – one area of crossing over the Berezovka River. The matrices have been developed to select optimal OSR methods with mitigation indicators, taking into account territorial, climatic and other conditions of KPO.

The report identified areas of operational measures for application of certain oil spill response methods, as well as the time and period of these measures application. For each spill scenario, a separate concept of operational measures was evaluated with identified optimal methods.

NEBA was approved by the state regulatory body, the Republic of Kazakhstan Ministry of Ecology and Natural Resources Committee for Environmental Regulation and Control.

If the conditions and scenarios of oil spill provided for by the KPO Emergency Oil Spill Response Plan do not coincide with the actual conditions of the oil spill, then the decision on the admissibility of the use of chemicals or controlled combustion of the oil spill is considered promptly by the state authorized body in field of environmental management based NEBA.

