

Water resources management

We recognize the importance of responsible management and conservation of water resources and strive to minimize water risks and impacts.

According to the World Resources Institute's forecast, Kazakhstan is among the countries with medium to high levels of water scarcity (20-40%), and by 2040 will be among the countries with extremely high or high levels of water scarcity. We are implementing measures to improve water use efficiency and reduce water consumption. We partner and collaborate with stakeholders to collectively address water-related challenges, including portfolio companies, local communities, and government agencies.

Water resources are managed by the Republic of Kazakhstan's Water Code and Environmental Code, sanitary regulations, water protection permits, and our portfolio companies' internal water management policies and programs. Portfolio companies themselves set targets for reducing water consumption. [GRI 3-3](#) [GRI 303-1](#) [SASB](#)

All wastewater, except that used for the transportation of ash and slag, undergoes thorough treatment to achieve the norms established by sanitary and hygienic standards by the procedures defined in the Methodology for Determining Environmental Emission Standards. Maximum concentrations of pollutants and limits of permissible discharges are established based on design data on maximum permitted discharges and the results of sanitary-epidemiological and environmental assessments. [GRI 3-3](#) [GRI 303-2](#) [GRI 303-4](#)

To assess the impact on water resources, we regularly monitor groundwater and surface water bodies quarterly. This monitoring allows you to regularly monitor the quality and availability of water resources. Special observation monitoring wells are used for groundwater. We also systematically carry out measures to reduce water consumption and increase water recycling. The results of monitoring the impact on sensitive water bodies are submitted to the authorized bodies every quarter. Environmental departments coordinate water regulation issues in portfolio companies. When conducting environmental impact assessments, public hearings are held to consider the impact on water bodies, among other things, and the opinions of all stakeholders are considered. [GRI 303-1](#) [GRI 413-1](#)



Share of water withdrawal of the heat and power generation sector

69.7%

Water withdrawal volume in areas with water stress

29.6
thousand MI

Water withdrawal

The most significant impact of our activities is on water bodies in the western region of Kazakhstan, such as the Ural River, Kigach River, Kokzhide Sands, Pyatimar Reservoir, as well as the Sharyn River and Bestyubinsk Reservoir (Moynak Hydropower Plant), Syrdarya River and Shardara Reservoir, K. Satpayev Canal, Shiderta Canal (Big Almaty Lake and the basin of the Big Almatinka River – Cascade of Hydroelectric Power Plants), Kapshagai reservoir (Kapshagai hydroelectric power plant), as well as Shu-Sarysus basin. These objects are of special ecological, economic, historical, cultural and recreational value. [GRI 303-1](#)

In 2023' the Fund's water withdrawal amounted to 63,924 thousand MI (excluding HPP water intake and associated format-on water - 331 thousand MI). Water withdrawal increased by 0.3% compared to the previous year, mainly due to increased water withdrawal from surface water for electricity generation. The largest water withdrawal among the companies o' the Fund's group is in the sector of electricity and heat generation (63,686 thousand MI). Hydroelectric power plants withdraw water for power generation, as well as during coal mining Bogatyr-Komir LLP needs large volumes of water, water withdrawal is carried 'ut strictly in the volumes authorized by state authorities. Water withdrawal from HPPs (AES Shulbinskaya HPP, AES Ust-Kamenogorsk HPP, Moinakskaya HPP, Bukhtarma HPP, etc.) in the electricity and heat generation sector amounts to 63.5 million MI. This volume is fully returned to surface water. [GRI 303-3](#) [SASB](#)

The oil and gas production, refining and processing sector withdrew 217.4 thousand MI (excluding associated formation water – 80.5 thousand MI), which is lower by 1% compared to the previous year. In JSC NC KazMunayGas in 2023, the Water Resources Management Program was developed

for 10 years. The program aims to address the issue of preventing water resources deficit for the preservation of ecosystems, ensuring the planned growth of the economy, and improving the water resources management system. Approval of the Program is expected in 2024. Starting in 2020, the Company will calculate its water footprint and post water resource management information on the Carbon Disclosure Project site as part of the Water Security Questionnaire.

Water withdrawal from the uranium processing mining sector amounted to 9.1 thousand MI. In 2023, the Board of Directors of JSC NAC Kazatomprom approved the Water Resources Management Strategy for 2023-2030. The document emphasizes the Company's commitment to rational and careful use of water in the process of production activities.

In total, more than 63,735 thousand MI of fresh water was withdrawn, which amounted to more than 99% of the total water withdrawal. [GRI 303-3](#) [SASB](#)

We consider water withdrawal in regions with increased water deficit, according to the water stress indicator WRI Aque-duct⁵⁵ these include the basins of the Caspian Sea, Aral Sea, Lake Balkhash, Syr Darya and Ural rivers. The volume of water withdrawal in deficit regions is 29.7 thousand MI, which is less than 1% of the total volume. In the areas with water deficits, the volume of freshwater withdrawal is 44% of the total water withdrawals. [GRI 303-3](#)

⁵⁵According to WRI Aque-duct: High category - total water load 40-80%, extremely high category >80%.



Total irrevocable water consumption
240.8
thousand MI

The volume of water reused
22.3
thousand MI

Water consumption

The most significant consumer of water resources among the sectors in the Fund's technological processes is the power and heat generation sector – 64% of the total water consumption of the Fund. The oil and gas production and processing sector accounts for 31%. Uranium mining and processing consumes 2%.

Total irrevocable water consumption in 2023 is 240.8 thousand MI, with 26.4 thousand MI (11%) in water-stressed regions. **GRI 303-5 SASB** The volume of water reused is 22.3 thousand MI, a 22% increase over last year. The volume of recycled water was 3.9 MI, of which the heat and power generation sector reused 0.44 MI. The volume of water reused is 22.3 thousand MI, a 22% increase over last year. The volume of recycled water was 3.9 MI, of which the heat and power generation sector reused 3.5 MI and the oil and gas production and refining sector reused 0.44 MI.

The data collection process for monitoring water consumption and withdrawal, depending on the types of production facilities, is carried out:

- annually, according to the environmental reporting form;
- daily, from automated water meters;
- daily by operational personnel of production facilities, etc. **GRI 303-3**

Water discharge

The total volume of discharges amounted to 63,682 thousand MI. Over than 99% of HPP water discharges into surface water bodies during power generation. For pressure maintenance 133 thousand MI is discharged into formations, 73 thousand MI is used for ash and slag waste disposal to ash dumps by the heat and power generation sector. **GRI 303-4**

Portfolio companies regularly carry out laboratory measurements of wastewater quality. Environmental legislation is established, and environmental standards for water quality are set during impact assessments. **GRI 303-4**

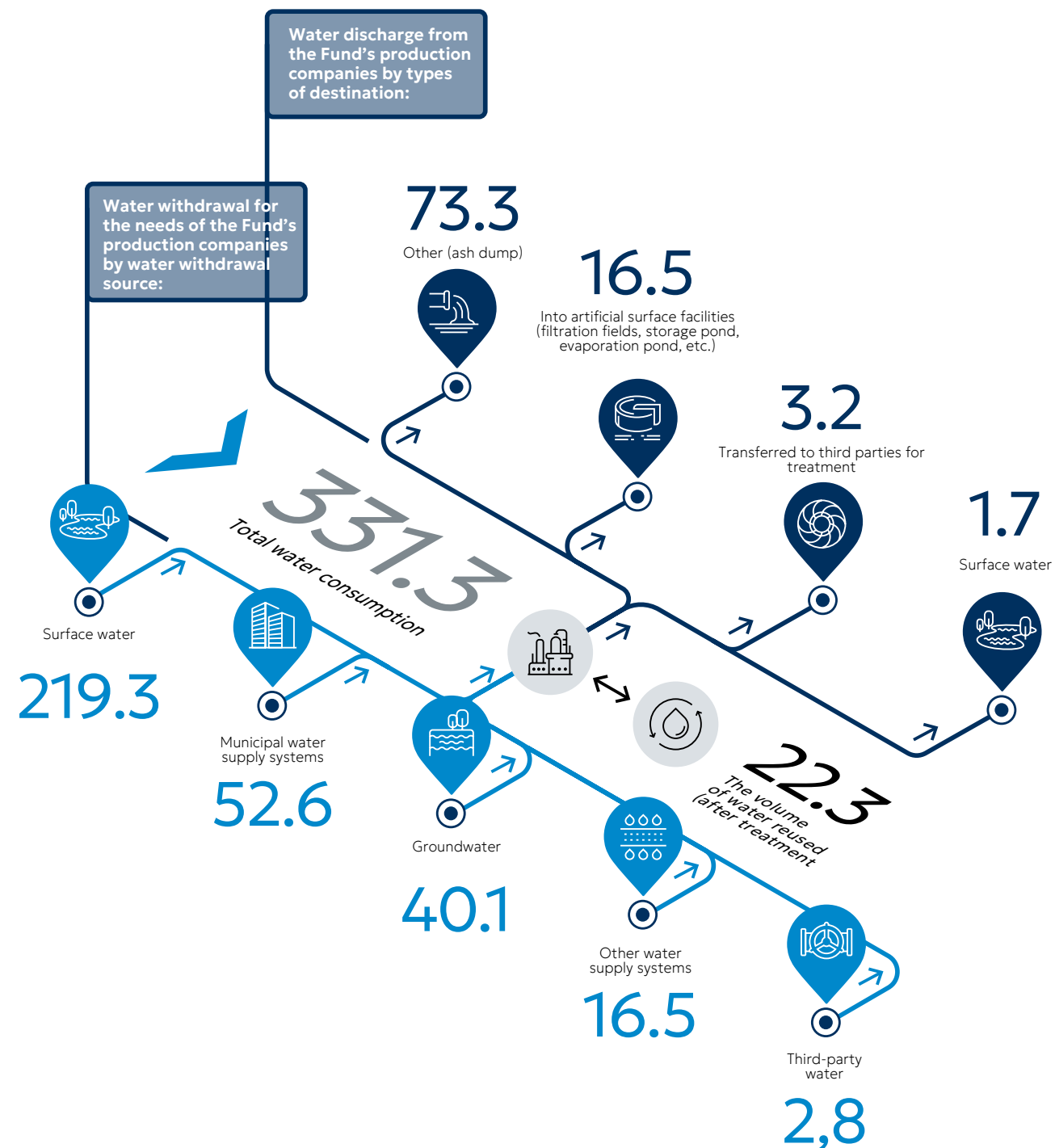
By the Methodology for determining environmental emission standards, the main pollutants, the concentrations of which are measured in wastewater, are: petroleum products, phosphates, suspended substances, nitrates, nitrites, etc. **GRI 303-4**

Water discharge to surface water bodies includes storm water from industrial areas and water not involved in the technological process. Treated water is discharged through storm water drainage systems. Wastewater must be treated by statutory regulations before discharge into water bodies or onto the surface of the ground.

The oil and gas production and refining sector discharged 144.1 thousand MI of water, 10.4 thousand MI of which was discharged to artificial surface facilities (evaporation ponds, storage ponds and filtration fields).

In the uranium mining and processing sector, the volume of water discharged amounted to 3.9 thousand MI. The volume of reused water (after treatment) amounted to 6.1 thousand MI, which is 13% more than last year and exceeds the volume of water discharged by the sector. **GRI 303-4**

Water balance of the Fund, thousand MI (million m³)





Water balance of the Fund, thousand MI (million m³)

| Name of indicator | 2020 | 2021 | 2022 | 2023 |
|--|-----------------|-----------------|-----------------|-----------------|
| Total water withdrawal volume, including: | 68,870.7 | 64,077.6 | 63,762.2 | 63,923.7 |
| Needs of the Fund's manufacturing companies:⁵⁶ | 297.8 | 315.9 | 316.1 | 331.3 |
| Surface water | 185.1 | 202.5 | 200.9 | 219.3 |
| Groundwater | 49.0 | 45.9 | 40.9 | 40.1 |
| Municipal water supply systems | 41.1 | 45.8 | 50.6 | 52.6 |
| Third-party water | 0.9 | 1.0 | 2.6 | 2.8 |
| Other water supply systems | 21.7 | 20.7 | 21.1 | 16.5 |
| Water intake for powering hydroelectric generators of HPPs: | 68,447.9 | 63,630.6 | 63,309.6 | 63,455.5 |
| Surface water | 68,447.9 | 63,630.6 | 63,309.6 | 63,455.5 |
| Extracted produced water | 125.0 | 131.1 | 136.5 | 137.0 |
| Total volume of discharged water, including: | 68,661.4 | 63,859.4 | 63,541.2 | 63,682.9 |
| From the Fund's production companies by types of destination:⁵⁷ | 89.8 | 99.2 | 96.6 | 94.7 |
| Surface water | 1.1 | 1.1 | 1.3 | 1.7 |
| Into artificial surface facilities (filtration fields, storage pond, evaporation pond, etc.) | 17.7 | 19.7 | 18.1 | 16.5 |
| Transferred to third parties for treatment | 3.5 | 3.6 | 2.3 | 3.2 |
| Other (ash dump) | 67.5 | 74.9 | 74.7 | 73.3 |
| Discharge from the HPP | 68,447.8 | 63,630.5 | 63,309.5 | 63,455.4 |
| Surface water | 68,447.8 | 63,630.5 | 63,309.5 | 63,455.4 |
| Discharge (injection) of produced water | 123.8 | 129.7 | 135.2 | 132.9 |
| Total water use, including GRI 303-5 | 68,870.7 | 64,077.6 | 63,762.2 | 63,923.7 |
| For production needs ⁵⁸ | 149.0 | 156.1 | 146.8 | 167.0 |
| For household and drinking water needs | 11.4 | 11.2 | 11.5 | 10.7 |
| Transferred without use to third parties | 131.3 | 143.8 | 148.0 | 145.7 |
| To power hydroelectric generators of HPPs | 68,447.9 | 63,630.6 | 63,309.6 | 63,455.5 |
| Reservoir pressure maintenance | 125.0 | 131.1 | 136.5 | 137.0 |
| other | 6.1 | 4.8 | 9.9 | 7.9 |

⁵⁶ Excluding water withdrawal from hydroelectric power stations

⁵⁷ Excluding water discharge from HPPs

⁵⁸ Excluding HPPs



The portfolio companies have installed meters and automated water metering systems to record water intake and discharge. Before discharging into artificial water bodies, wastewater undergoes mandatory treatment and laboratory control according to quality standard⁵⁹. Wastewater treatment is performed by physical-chemical, mechanical and biological methods. Every quarter we control the quality of wastewater treatment and only by accredited laboratories, i.e. the indicators of which can be trusted.

Although many of the Company's subsidiaries do not have a significant negative impact on water resources, they strive for rational water use. Water consumption is insignificant in the electricity transmission sector, but transformer oil can be a likely source of water pollution. Therefore, equipment selection fa-

vors more environmentally friendly technologies without oil, eliminating contamination of groundwater and soil. In the uranium mining and processing sector, mining is carried out using in-situ borehole leaching, which significantly reduces the impact of operations on biodiversity and water resources in the regions of operation.

As part of the Tazalyq project in the oil and gas production and refining sector at Atyrau Refinery LLP under the subproject "Reconstruction of the normatively treated effluent channel and recultivation of evaporation fields of Atyrau refinery LLP", the connection of the plant's normatively treated effluent pipeline to the Atyrau City HSPS was completed. An automated wastewater monitoring system is being installed under the project.

⁵⁹ The norms of pollutant discharge are calculated according to the «Methodology for determining the norms of emissions into the environment» approved by the Order of the Minister of Ecology, Geology and Natural Resources of the Republic of Kazakhstan dated March 10, 2021, No. 63.

[GRI 303-4](#)