

WATER RESOURCES MANAGEMENT

The sustainable use of water resources, effective wastewater treatment, and preventing contamination of natural water bodies with oil or petroleum products are all key priorities for Gazprom Neft in the management of water resources.

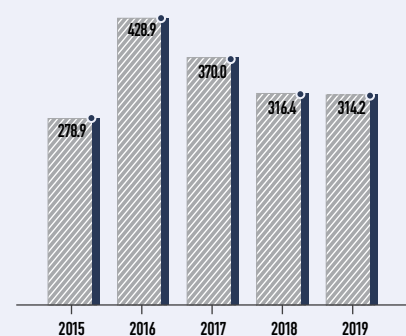
Gazprom Neft monitors water protection zones, surface water, groundwater and wastewater, and assesses the condition of bed sediments in surface water bodies in its regions of operation.

Water withdrawal and consumption decreased mainly because of a reduction in water production from the Cenomanian strata which was, in turn, a result of a higher water cut at the company fields.

Building **Biosphere biological treatment facilities** at the Moscow and Omsk Refineries are among the key projects being implemented by the company around water resources management. These facilities feature a multi-stage wastewater treatment system, which includes mechanical, physical and chemical, biological, filtration and ultrafiltration stages, as well as a reverse osmosis unit.

The Biosphere facilities help to achieve wastewater treatment efficiency of 99.9%, and to reduce total water withdrawal three-fold. Closed-loop water treatment makes it possible to reuse more than 75% of treated water in the production process.

Total water consumption for company needs, million m³



371.2 million
m³
total water withdrawal

-0.7%
reduction in water
consumption for company
needs

Water use, million m³

	2015	2016	2017	2018	2019
Total water withdrawal	297.0	446.1	416.2	372.2	371.2
Total water consumption for company needs	278.9	428.9	370.0	316.4	314.2
Total water discharge	21.9	43.5	47.5	56.3	57.8

Biosphere biological treatment facilities

The construction of the innovative Biosphere biological treatment facilities at the Moscow and Omsk Refineries is a central environmental project in the Gazprom Neft refinery upgrade programme.

A unique facility, designed by Russian engineers, includes a multi-stage wastewater treatment system involving mechanical, physical and chemical, and biological treatment, as well as carbon filtration and ultraviolet disinfection.

After the Biosphere treatment facilities were integrated into the refinery process

flow, wastewater treatment efficiency increased to 99.9%, with the refinery switching to closed-loop water use, and this significantly reduces the load on municipal wastewater treatment facilities.

Up to **99.9%**

wastewater treatment efficiency at the Biosphere biological treatment facilities

Moscow Refinery

After the new treatment facilities were put into operation, the Moscow Refinery reduced total water withdrawal three-fold, with more than 75% of treated wastewater now being reused in the production process. The Omsk Refinery

is expected to demonstrate a similar performance after the Biosphere treatment facilities are commissioned at the site; moreover, the treatment facilities will occupy a smaller area, even though their throughput is projected to increase.

3^x

reduction in water withdrawal at the Moscow Refinery

Omsk Refinery

The first phase of construction of the innovative Biosphere treatment facilities was completed at the Omsk Refinery in 2019 and the installation of tank equipment was completed. In the future, the tank battery will form part of the facilities and will be used for the preliminary mixing of all industrial wastewater produced by the refinery before it is sent for further treatment.

The construction of the Biosphere facilities is part of the ongoing full-scale modernisation of the Omsk Refinery, and is a major element of initiatives launched as part of the federal 'Clean Air' project. The new wastewater treatment system is one of the most important environmental projects being implemented by Gazprom Neft in the Omsk Oblast, with investment in the project totalling ₺19 billion. The construction of the Biosphere treatment facilities is scheduled to be completed by 2021.

The Biosphere facilities have been designed as a multi-stage water treatment complex. The tank battery that forms part of the Biosphere facilities comprises 12 tanks with a capacity of 20,000 to 100,000 cubic metres; it was produced by Russian manufacturers in accordance with international standards. When the water has been mixed in the tanks, it is sent for mechanical treatment, which involves removing petroleum products and other impurities. Then, when it has been physically and chemically treated, the water is purified using chemicals, and is sent to a special bioreactor, where the remaining petroleum products are degraded by micro-organisms. Finally, the water is passed through carbon filters, disinfected with ultraviolet irradiation, and then reused in the production process. Petroleum products recovered during filtration are sent for processing and recycling.

₺19 billion

Biosphere project investment in the Omsk Oblast

WASTE MANAGEMENT AND LAND USE

To minimise the risk of oil and petroleum products contaminating the soil, Gazprom Neft constantly monitors the reliability of its equipment and makes use of new technologies. In addition, the company recycles waste generated in the course of production.

The growth in waste generation in 2019 was driven mainly by an increase in the number of wells under construction at Gazprom Neft fields, and ongoing refinery modernisation, which involves upgrading production capacities and dismantling old equipment.

Nevertheless, 96% of waste generated by the company is treated and recycled using environmentally safe methods.

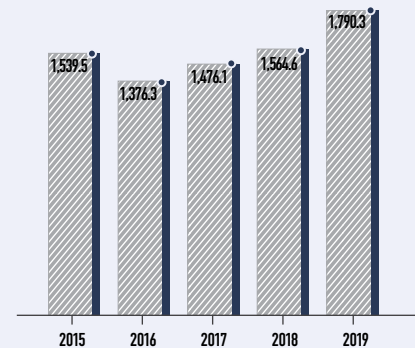
Sludge generated by drilling in the course of hydrocarbon exploration and production makes up a significant proportion of the waste generated by the company. Improving the efficiency of sludge processing is an important environmental priority for Gazprom Neft.

The company's drilling-waste management framework is designed to reduce environmental risks and standardise waste management requirements. It takes into account the infrastructure of the fields being developed by the company, existing drilling waste processing technology, technical and economic indicators, and the remoteness of the field in question.

Drilling rigs currently used by Gazprom Neft are equipped with a drilling-waste cleaning and drying system. This ensures that as much previously used drilling fluids and process water as possible are reused in the production process.

The company continues to develop infrastructure for using waste in the production process, and to explore technological solutions that will help to reduce waste generation.

Waste generation, kt



96%

of waste is treated and recycled using environmentally safe methods

Waste generation and recycling, kt

	2015	2016	2017	2018	2019
Waste generation	1,539.5	1,376.3	1,476.1	1,564.6	1,790.3
Total volume of recycled and treated waste	1,410.3	1,310.1	1,298.4	1,517.4	1,720.5
Share of waste sent for recycling, %	92	95	88	97	96