



UECP  
ROSATOM



ENVIRONMENTAL  
SAFETY  
REPORT

20  
22

# FOREWORD

Dear readers!

This year we publish the fifteenth annual environmental safety report prepared by Urals Electrochemical Plant Joint-Stock Company.

It should be noted that 60 years ago, in 1963, the order of Council of Ministers of the USSR established the All-Union Export & Import Bureau Technobexport to perform, among other things, import and export operations involving radioactive isotopes. Fifty years ago, in 1973, Technobexport delivered the first batch of enriched uranium to France. This EUP batch was generated by Urals electrochemical plant. To carry out foreign-trade operations UECP was the first in the USSR to develop and bring into operation the installation for uranium hexafluoride transfer to foreign-made cylinders (known as horizontal cylinders).

Since then TENEX and UECP are long-term partners, covering by joint efforts over one third of foreign design reactor needs for uranium enrichment services and providing a considerable share in all main geographical segments of this market. Today UECP JSC under TENEX JSC contracts delivers over 80% of its products to foreign customers, providing considerable currency earnings both for ROSATOM State Corporation, and for the budget of the Russian Federation.

Therefore, this environmental safety report was prepared collaboratively with TENEX JSC experts. Results of this collaboration are brought to your attention below...

*Cover page: Ekaterina Ignatova, TENEX JSC*



UECP  
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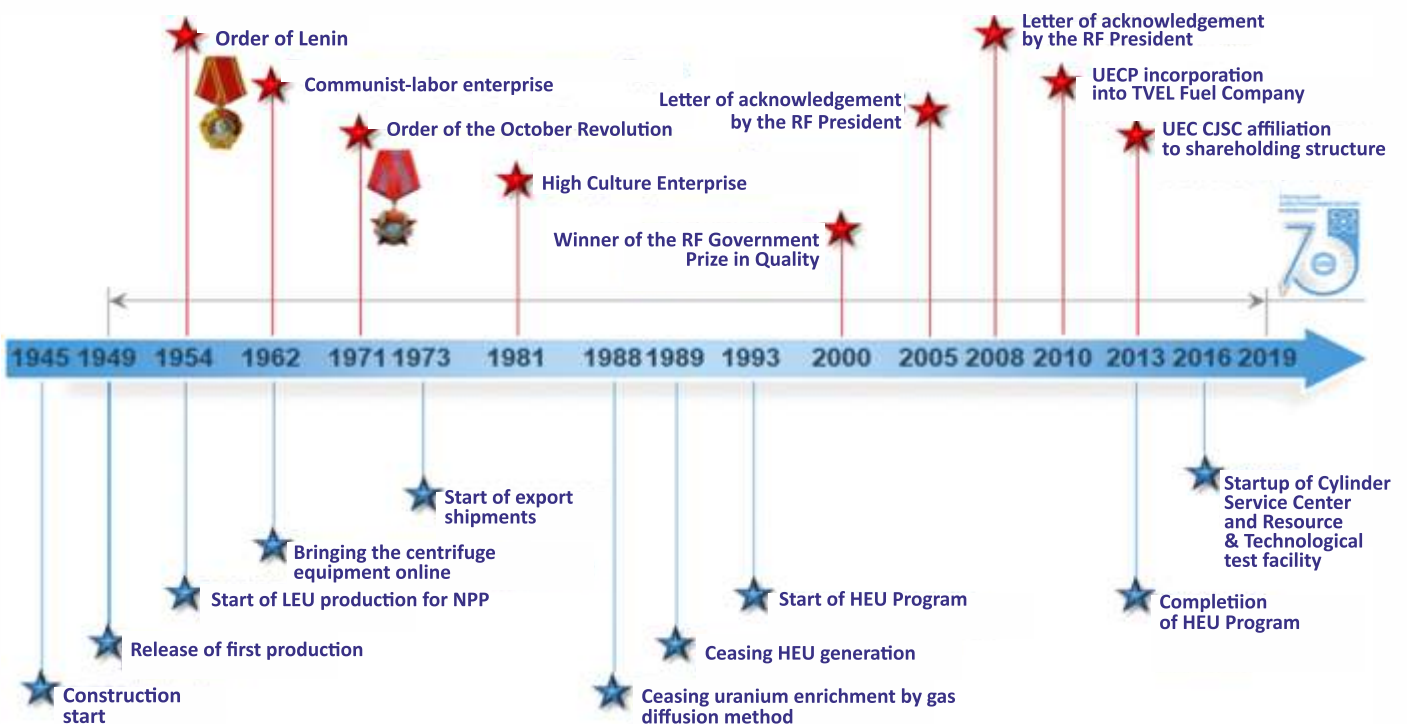
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# 1

## UECP JSC background information and core business



The USSR Soviet of People's Commissars in 1945 took the decision to start the construction of gas diffusion plant in Sverdlovsk-44 located in Sverdlovsk region. The Plant was designed for producing highly enriched uranium (HEU) under the Soviet nuclear weapons program. Urals Electrochemical Plant came on line in 1949. It was the first in the USSR industrial company providing commercial uranium isotope separation using gas diffusion method. To meet the needs of nuclear power industry (reactors, offshore power plants, research reactors and nuclear power plant reactors) the production of low enriched uranium (LEU) started in 1954.



The first in the world plant providing uranium enrichment by centrifuge method, started operation in 1962. It was the important step towards raising efficiency of UECP enrichment production. The well-established team of UECP experts and qualified personnel steadily providing flagship operation of enrichment production underpinned it. The plant reconstruction program started in 1966, and by 1988, centrifuges completely replaced the gas diffusion equipment. It made possible to reduce the power consumption of separation production by a factor of 10 resulting in twofold or threefold increase of enrichment capacity.

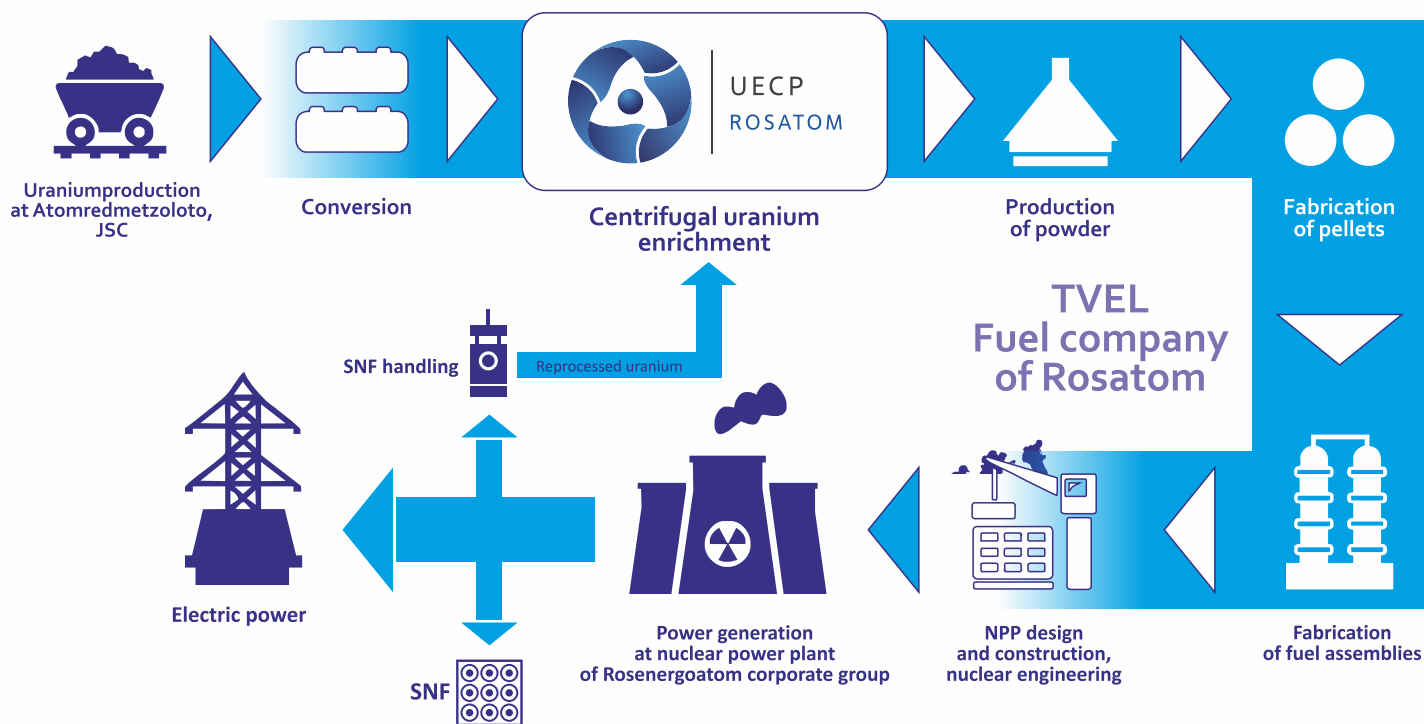


In the early seventies UECP entered the international market and since then, it has exported LEU to the companies in France, Germany, Belgium, England, the USA, South Korea, Sweden, Spain, Finland, Switzerland, Italy, Argentina. UECP ceased generation of weapon-grade uranium in 1989. Pursuant to intergovernmental agreements on reduction of nuclear weapons, UECP initiated HEU conversion into fuel for nuclear power plants in 1995. For this purpose, UECP developed and introduced the special HEU-LEU technology.

On August 15, 2008, Federal State-owned Unitary Enterprise Ural Electrochemical Integrated Plant was reorganized into Joint-Stock Company Ural Electrochemical Integrated Plant.

The company key milestone was its incorporation into ROSATOM TVEL Fuel Company in 2010. TVEL Fuel Company includes separation-sublimation combine, gas centrifuge production, nuclear fuel fabrication and research & development clusters. It enabled further effective development of the Company, its production facilities, infrastructure and human resources.

## UECP JSC Position in Rosatom Nuclear Fuel Cycle



In accordance with the Russian Federation law, the full commercial name of the Company since 2015 is Urals Electrochemical Plant Joint-Stock Company (UECP JSC).

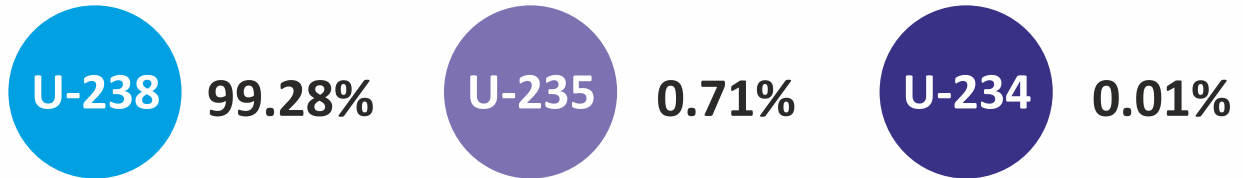
UECP JSC is located in the industrial area of Novouralsk city in Sverdlovsk region, 80 km north-west of Yekaterinburg. Two settlements share borders with the Company: Novouralsk city (about 81 000 residents) and Verkh-Neivinsky settlement (about 5 000 residents).

UECP JSC is one of the key players in the Russian nuclear fuel cycle, holding intermediate position between uranium mining and fuel fabrication for nuclear reactors.

At present UECP JSC is the largest uranium enrichment company in Russia and around the globe. The Company enrichment production applies highly effective and reliable gas centrifuge technology. The following companies represent enrichment production of Russia and apply the same technology:

- Electrochemical Plant, Joint-Stock Company, (ECP), Zelenogorsk, Krasnoyarsk region
- Siberian Chemical Plant, Joint-Stock Company, (SCP), Seversk, Tomsk region
- Joint-Stock Company Angarsk Electrolysis Chemical Plant (AECP) Angarsk, Irkutsk region.

**Natural uranium consists of three radioactive isotopes:**



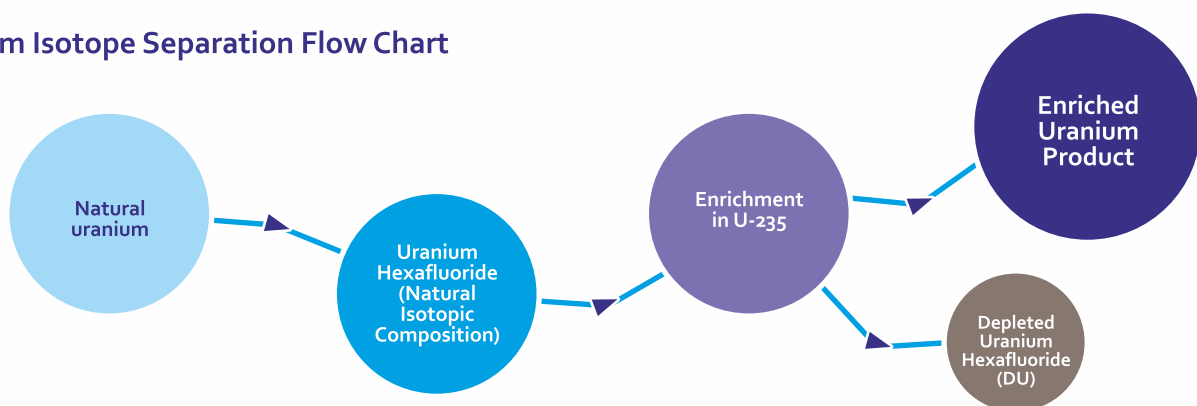
Today the most part of nuclear power reactors run on uranium fuel enriched in U-235. The Russian enriched uranium export contributes to balancing global energy mix and is of the same importance as the Russian gas and oil export.

The heart of UECP JSC structure is the production cluster of process shops 53, 54, 87, and associated divisions: analytical center (department 16), chemical metallurgical shop (shop 70), machinery revision shop (shop 19) and special product storage, transportation and control department (department 7). The gas centrifuge cascades are located in shops 53, 54, 87. "Chelnok" facility is located in shop 54 and serves for transfer of uranium hexafluoride of required U-235 assay into the cylinders of foreign customers.

The chemical metallurgical shop deals with enrichment production waste processing (extraction, precipitation, vessel washing, U3O8 fluorination, solid radioactive waste conditioning, metal waste preparation), operation of process pulp filtration unit, preparation of solid radioactive waste delivery to State Unitary Enterprise "National operator for radioactive waste management" (SUE NO RWM). Machinery revision shop carries out equipment decontamination and process equipment repair. Analytical center performs analytical procedures and produces certified reference materials of uranium isotopic and chemical composition.

Special product storage, transportation and control department ensures nuclear material storage and transportation and performs some operations related to nuclear material control and accounting.

### Uranium Isotope Separation Flow Chart



The natural uranium is converted into uranium hexafluoride to ensure enrichment process.

Enrichment in U-235 results in generation of enriched uranium product (EUP) and depleted uranium hexafluoride (DU).

EUP it delivered to the customer, and DU is delivered for storage and further processing.



## 2 Integrated management system

Environmental management system is a part of corporate management system which has well-shaped organizational structure and is aimed to achieve the environmental policy objectives through implementation of environmental programs.

Environmental management concept is based on the model of sustainable development. The summit of state heads took place in 1992 in Rio de Janeiro. It was devoted to sustainable development of human society and nature, and adopted Agenda 21 with general provisions of the new concept suggested to all countries of the world. The summit concluded that environmental management shall be treated as the key dominant of sustainable development and the highest priority for industrial operations and business.



In 1993 in the course of the Uruguay Round negotiations devoted to establishment of the World Trade Organization, decision was taken to introduce the new international environmental management standards.

International Standardization Organization (ISO) issued ISO 14000 standards specifying the concept of environmental management system.

### UECP JSC management system



One of the key parameters of the Company sustainable development is the effectiveness of Quality management system (QMS) that covers the whole life cycle of products, from development to implementation, and ensures faultless operation of all production process chains. UECP JSC QMS was subject to continuous improvement: from zero-defect production, complex quality control system to QMS implementation, certification and performance starting from 2004 according to ISO 9001.



The development of technology of enriched uranium transfer into the transport cylinders of international customers was finalized in 1973.

The Company received no product quality claims throughout its export operations.

Ensuring safe and sustainable development, minimization of production environmental impact

UECP JSC management system has been established and certified in accordance with international standards. It is maximally customer-oriented and focused on understanding the needs and expectations of all interested parties, continuous improvement of business processes and implementation of system approach to company management.

The Company management system (MS) is a part of UECP JSC corporate management system, and a part of TVEL Fuel Company corporate management system and Rosatom State Corporation MS arranged according to "the system of systems" principle. Integrated MS comprises Quality management system (QMS), Environmental management system (EMS), Occupational health & safety management system (OH&S MS), Energy management system (EnMS), and meets the requirements of ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, ISO 50001:2018.

The compliance was proved by the certificate № TIC 15 100 52672/10 - TIC 15 104 10699/10 - TIC 15 116 11266/10 - TIC 15 275 14075/10. The certificate was issued on 28.08.2018 and according to the results of advanced witness audit was renewed 20.10.2020 and certified by TÜV Thüringen, Jena, Germany certification body. Scope of certification: production, supply and storage of uranium enriched to less than 65% for power and research reactors; maintenance and testing of shipping packaging sets for uranium hexafluoride.

Safety culture and Rosatom production system, financial, legal, asset management and other management areas are within the company MS.

Product quality and process safety assurance and improvement are the key issues of the Company operation and development

## **UECP JSC MS certification history:**

**2004 – certification of conformity with ISO 9001:2000**

**2009 – certification of conformity with ISO 9001:2008**

**2010 – certification of conformity with ISO 14001:2004**

**2013 – certification of conformity with BS OHSAS 18001:2007**

**2014 – certification of conformity with ISO 50001:2011**

**2018 – certification of conformity with ISO 9001:2015, ISO 14001:2015**

**2020 – certification of conformity with ISO 45001:2018, ISO 50001:2018**

**2021 – certification of conformity with ISO 28000:2007**

In 2020, UECP JSC accepted for execution ISO 19443:2018 "Quality management systems – Specific requirements for the application of ISO 9001:2015 by organizations in the supply chain of the nuclear energy sector supplying products and services important to nuclear safety (ITNS)". UECP JSC also commenced development, introduction and preparation for certification of UECP JSC security management system for the supply chain according to ISO 28000:2007 "Specification for security management systems for the supply chain".



Management system audits in UECP JSC subdivisions, subsidiaries and affiliates, vendors of services/products, are conducted according to the schedule.

**Therefore, at present UECP JSC integrated management system includes:**

- Environmental management system aimed at improving environmental safety procedures
- Quality management system aimed at improving product quality procedures
- Occupational health & safety management system for the Company staff
- Energy management system aimed at improving energy saving and conservation of natural resources
- Security management system for the supply chain

**Integrated management system is introduced and maintained in all UECP JSC divisions providing quality and operational safety at all stages of production.**

## **Iena Safronova:**

**I'm currently working at Tenex  
JSC, Business information  
support department.**

**I like active lifestyle, open-air  
sports and alpine skiing**



***Tenex JSC supports implementation of environmental programs and projects.  
For example, Amur Tiger Conservation strategy in the Far East***

### 3 UECP JSC Environmental Policy

Continuous mitigation of environmental and social impact is the key priority of UECP JSC environmental policy. When planning its activities, the Company takes into consideration the interconnection of environmental and production issues. UECP JSC employees are aware of their responsibility for reducing man-caused impact.



In pursuance of ROSATOM State Corporation environmental policy UECP JSC management complies with the following key principles:

- presumption of potential environmental hazard in planning and carrying out activities
- permanent readiness of UECP JSC management and personnel to prevent and mitigate emergency situations and other accidents
- coincidence of environmental, economic and social concerns of UECP JSC and population non-governmental organizations, governmental authorities and local authorities for the purpose of sustainable development and promotion of favorable environmental and ecological safety
- ensuring high environmental performance, mitigation of UECP JSC environmental impact and natural resources utilization at reasonable costs
- transparency and availability of the information related UECP JSC operations in the field of environmental protection and ecological safety.

UECP JSC environmental protection and ecological safety main tasks are as follows:

- comply with international, federal and regional legislation, rules and guidelines in the field of radiation and nuclear safety, environmental protection, sanitary-and-epidemiological well-being of population, civil protection in emergency situations of natural and man-made origin, and other UECP JSC commitments
- develop environment and radiation monitoring systems using advanced automatic equipment and software
- enhance resource- and energy efficiency of production
- ensure decommissioning of UECP JSC out-of-service nuclear facilities
- reduce the volume of radioactive and hazardous industrial waste
- constantly inform UECP JSC personnel, citizens and other interested parties of environmental and radiation situation and UECP JSC environmental impact
- continuously improve the integrated management system as required by ISO 9001, ISO 14001, OHSAS 18001, ISO 50001, IAEA GSR Part 2, IAEA GS-G-3.1.

UECP JSC environmental policy was first introduced on April 22, 2008 by UECP JSC General Director order. Since then the Company environmental policy has been annually revised and updated.

The current revision of UECP JSC environmental policy was introduced on November 1, 2022 by UECP JSC General Director order, and approved by ROSATOM State Corporation and TVEL JSC. The Company environmental policy is available in mass media and on UECP JSC open source website.



## 4 UECP JSC basic environmental regulations

- Constitution of the Russian Federation
- Federal Law on Environmental Protection No 7-FZ of January 10, 2002
- Federal Law on Ecological Assessment No 174-FZ of November 23, 1995
- Federal Law on Ambient Air Protection No 96-FZ of May 4, 1999
- Water Code of the Russian Federation No 74-FZ of June 3, 2006
- Federal Law on Production and Consumption Waste No 89-FZ of June 24, 1998
- Federal Law on Sanitary and Epidemiological Well-being of Population No 52-FZ of March 30, 1999
- Federal Law on Radiation Safety of Population No 3-FZ of January 9, 1996
- Federal Law on Nuclear Energy Use No 170-FZ of November 21, 1995
- Federal Law on Radioactive Waste Management and Amendments to Certain Legislative Acts of the Russian Federation No 190-Z of July 11, 2011
- Federal Law on Underground Resources No 2395-1 of February 21, 1992
- Sanitary Rules SP 2.6.1.2523-09 of July 7, 2009 NRB-99/2009 Radiation Safety Standards
- Sanitary Rules SP 2.6.1.2612-10 of April 26, 2010 «Basic Sanitary Rules for Radiation Safety» (OSPORB-99/2010)
- "Requirements to enterprises on reduction of emissions of pollutants into the atmospheric air under unfavorable meteorological conditions", approved by the order of RF Ministry of Natural Resources No 811 dated 28.11.2019

Furthermore, the Company activities in the field of radiation, nuclear and environmental safety are regulated by the Russian Federation governmental rules, statutory standards, sanitary rules, norms, guidelines and other regulatory documents, issued by the government of the Russian Federation, ministries, departments, state regulatory authorities within their competence.

### The list of the Company main authorization documents in the field of environmental protection

UECP JSC has got all necessary permits in accordance with the applicable environmental legislation of the Russian Federation, including:

- certificates of public registration of environmentally hazardous facilities
- permits for emissions of polluting chemical substances and radionuclides
- limit for production and consumption waste disposal
- certificates for hazardous production and consumption waste
- water use agreement
- decisions on the granting of water bodies for use
- licenses for nuclear energy use
- other documents

Contractors providing services and performing works at the Company site have the complete set of necessary permits and licenses.

# 5

## Industrial ecological control and environmental monitoring

### 5.1 UECP JSC site conditions

There are no areas polluted by radionuclides at UECP JSC industrial site and sanitary protection area. Gamma-radiation equivalent dose rate does not exceed the natural background. The average value makes 0.06  $\mu\text{Sv}/\text{hour}$ . Over the whole period of UECP JSC operations there were no cases of environmental contamination caused by emergencies, spills, etc. Pursuant to the "Decision on establishing category of UECP JSC potential radiation hazard as per Principal Sanitary Radiation Safety Rules (OSPORB-99/2010)" approved by the RF FMBA territorial body, UECP JSC was assigned the III category of potential radiological hazard. Therefore, the control area for UECP JSC is not determined. The sanitary protection area for UECP JSC, as the nuclear hazardous facility, is specified by "Project for UECP JSC sanitary protection area" and approved by the Head of Novouralsk urban district and UECP JSC General Director. The Company site total area makes 512.3 hectares. The Company land assets do not include the conservation areas and valuable biodiversity territories.

**The following monitoring objects within UECP JSC monitoring area are:**

- water bodies of the open hydrographic system
- atmospheric air
- vegetation
- atmospheric precipitation (snow)
- radiation environment
- meteorological parameters

**UECP JSC performs monitoring of radiation, ecological situation and natural environment using three systems:**





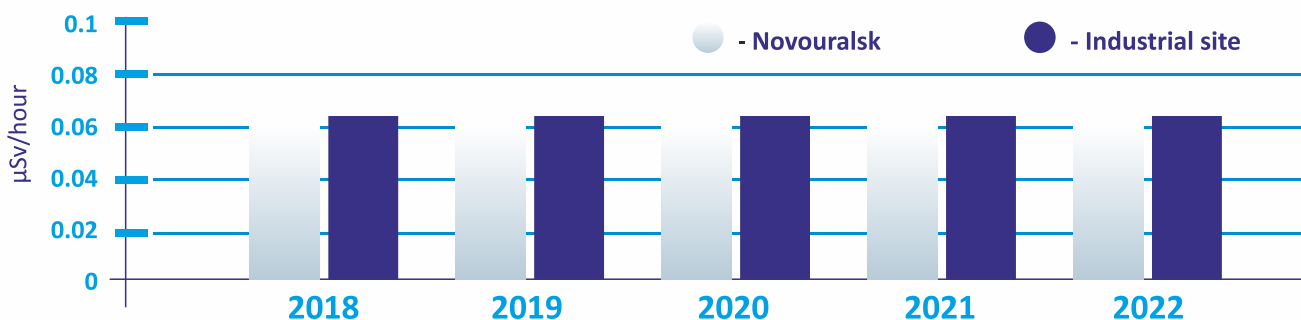
## 5.2 ARMS. Radiation monitoring and meteorological observations

Control of radiation situation is ensured by Environmental protection department (EPD) using automated radiation monitoring system (ARMS), being a part of ROSATOM unified state automated radiation monitoring system. The system is designed for ensuring continual automatic monitoring of radiation and meteorological conditions at monitoring stations connected with the control panel. At present UECP JSC automated radiation monitoring system is equipped with the most advanced equipment.

Nine monitoring stations cover all UECP JSC industrial sites. The measuring data of equivalent gamma-radiation dose rate received by UECP JSC automated radiation monitoring system are daily submitted to FSUE "ROSATOM Situation-crisis center". Thereafter these data become available on the web-site [www.russianatom.ru](http://www.russianatom.ru).

According to the results of regular laboratory measurements the content of radioactive substances in atmospheric air and in water objects is stably low and has no tendency to increase. The exposure dose rate at the Company industrial sites and in Novouralsk does not exceed 0.15  $\mu\text{Sv}/\text{hour}$ , which is well below the standard values and background exposure dose rates specified for Urals region.

Diagram 1. Average equivalent dose rate



## 5.3 Monitoring of the natural environment

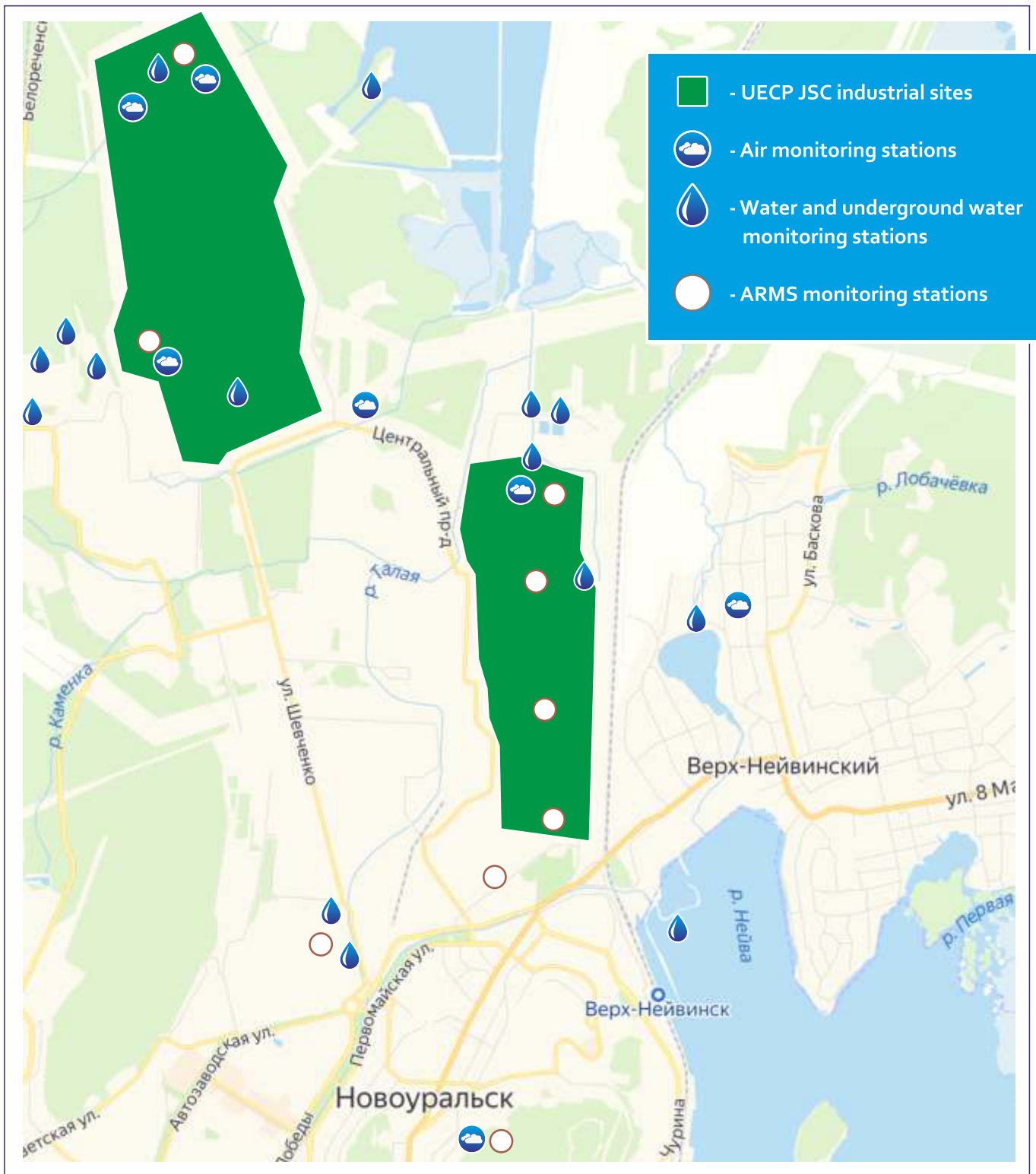
UECP JSC Environmental protection department performs industrial environmental control and ambient monitoring. UECP JSC Analytical center performs environmental radiation monitoring. Several accredited companies perform the chemical content analysis under the existing contracts.

UECP JSC Analytical center is equipped with the most advanced instruments, equipment and measuring devices for sampling and analysis of environmental samples. For example, uranium isotope content in the natural environment locations is determined by mass-spectrometric analysis using modern mass-spectrometers manufactured by the leading global producers of analytical equipment.

### Results of long-term measurements show that:

- the content of radionuclides in ambient waters is  $\sim 150$  times below the sanitary limits.
- the content of radionuclides in Novouralsk and UECP JSC site atmospheric air does not exceed the background level and is  $\sim 270$  times below acceptable limit.
- the radionuclide content in soil does not exceed the background level.

## UECP JSC environmental monitoring locations



Over the long-term period of monitoring (since 1960) the content of chemical pollutants (including uranium compounds and other heavy metals) as well as radionuclides in UECP JSC ambient environment has not exceeded the background level and has no tendency to increase.



## 5.4 UECP JSC subsurface monitoring

Since it became necessary to determine the laws of dynamics, the structure and chemical composition of underground waters in order to monitor the quality of the Company's ambient waters and technical water supplied to the process facilities, the Company created the network of monitoring wells and stations that keep track of hydrodynamic status and water quality of water-bearing layers. The methods, techniques and equipment for wells installation and connection, sampling and sample analysis procedures, and other operations were tested.

Introduction of brand new subsurface monitoring system currently makes it possible to obtain correct and complete information on the state of underground hydrosphere. The system also serves as a resource for establishing basis of the future integral information-analytical system of radiation ecological monitoring (IAS REM) at ROSATOM State Corporation enterprises.

Arrangement of subsurface state monitoring system included geologic and geodesic research of UECP JSC radioactive waste storage locations, cameral treatment of historical research. The company conducted research of change in geo-ecological indicators, performed analysis of the site geological and hydro-geological structure and prepared geological and hydro-geological cross sections. This work resulted in establishment of UECP JSC underground network of water observation wells that includes 43 operating wells. The geo-information system was established. 21 wells at I-IV industrial sites and 5 wells at VI-VII industrial sites were additionally drilled in 2020 in terms of subsurface monitoring system improvement.

The goal of current and previous research is to confirm that UECP JSC nuclear hazardous facilities do not affect the underground waters, and that the impact will not cause the population and personnel radiation and toxic exposure and natural environment radioactive and chemical contamination.

Results of monitoring the area outside UECP JSC site show that uranium isotopes intervention is within acceptable limits and therefore confirm UECP JSC zero impact on the underground waters.



### **Nastya Kazanskaya:**

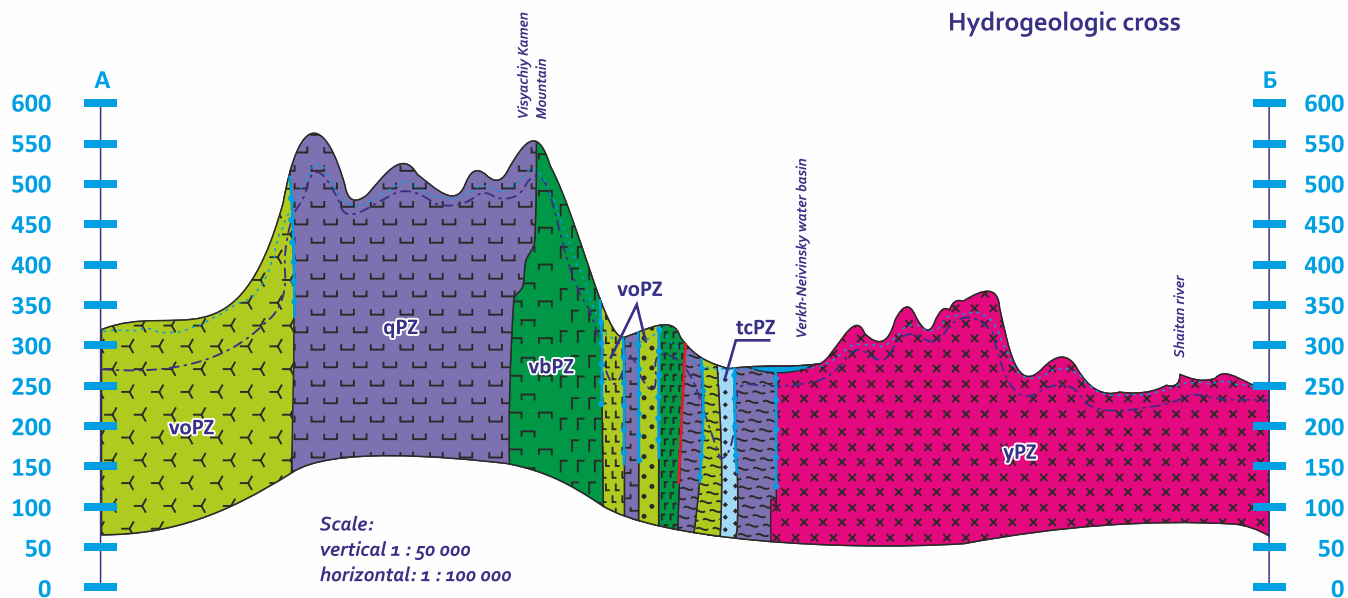
**I joined TENEX JSC in 2021. My focus areas are sustainable development, report preparation, social projects.**

**I'm keen on arts and popular-science literature.**

*TENEX JSC supported the project for survey and monitoring of snow leopard population in South Siberia.*



## Hydrogeologic cross section in the area of UECP JSC and Novouralsk urban district location



### LEGEND

#### HYDROGEOLOGICAL AREAL CLASSIFICATION

- voPZ** Paleozoic water-bearing zone of igneous-sedimentary rock fracturing. Volcanomictous sandstone, bibbley-rock, puff-stone, basalt, tuff siltstone, tuff sandstone, carbon-bearing cherts.
- tcPZ** Paleozoic water-bearing zone of terrigenous-carbonate rock fracturing. marmorized limestone, crystalline limestone.
- ypZ** Paleozoic water-bearing zone of intrusive felsic rock fracturing. Granodiorite, tonalite, diorite.
- vbPZ** Paleozoic water-bearing zone of basic and medium intrusive rock fracturing. Gabbro-diorite, harzburgite.
- qpZ** Paleozoic water-bearing zone of ultrabasic intrusive rock fracturing. Dunite, serpentinite, pyroxenite.

#### LITHOLOGICAL COMPOSITION

- Dunite
- Serpentinite
- Chert
- Granodiorite
- Basalt
- Puff-stone of various composition
- Crystalline limestone
- Gabbro-diorite
- Harzburgite
- Bibbley-rock

## The population is not exposed to radiation

In 2014 the Company experts developed the science-based reference levels. Compliance with these levels means zero environmental damage ('zero' environmental impact). All environmental components conform to these reference levels.

Table1. Main monitoring objects within UECP JSC impact area

Object of ecological interest	Effect indicator	Zero Level	2018	2019	2020	2021	2022
Ambient waters	Uranium content, kg/l	2,2	<0,1	<0,1	<0,1	<0,1	<0,1
Ambient air	Total α-activity Bq/m	0,33	<0,13	<0,13	<0,13	<0,1	<0,1
Vegetables – potatoes	Uranium content, kg/l	2,4	0,9	0,79	0,8	0,4	0,5
Vegetables – except of potatoes	Uranium content, kg/l	1,7	0,6	0,4	0,47	0,5	0,6
Grassland	Uranium content, kg/l	135	35	32	32	38	10

Actual Content



## 6 Environmental impact

According to the environmental legislation, UECP JSC performed public registration of all its facilities being in operation. As related to environmental impact, UECP JSC enrichment facilities are assigned to the 2nd category facilities. UECP JSC support facilities are assigned to the 3rd category facilities.

### 6.1 Withdrawal of water from water sources

UECP JSC uses water from Verkh- Neivinskoye, Neivo- Rudyanskoye and Ayatskoye water basins to supply enrichment production external cooling system, and MUP Vodokanal (Municipal unitary company) water as drinking water.

Water recycling is performed as follows: after cooling of equipment, the process water is running through the guide channels to Verkh- Neivinskoye and Neivo- Rudyanskoye basins. The water is subject to cooling in the basins and further supply to the process facilities using pumping stations.

#### Characteristics of water sources

- **Verkh-Neivinskoye water basin**

is used as centralized source of drinking water and recreation area for the residents of Novouralsk city and Verkh-Neivinsky settlement, and for supply of process water to the companies of Novouralsk urban district and Verkh- Neivinsky settlement. Withdrawal of water greatly affects the water basin (makes over 5 % of average annual volume).

- **Neivo-Rudyanskoye water basin**

basin serves for supply of process water to the Company facilities and is used as wastewater receiver for Novouralsk urban district industrial and public utilities.

- **Ayatskoye water basin**

serves as reserve water source for adding water to Verkh- Neivinskoye water basin in the low water years. It also serves as water source for gardeners' partnerships.

Table 2. Water withdrawal from natural water sources, thousand m<sup>3</sup>/a

Water source	2018	2019	2020	2021	2022	Allowable withdrawal of water, thousand m <sup>3</sup> /a
Verkh-Neivinskoye water basin	2419	2586	4902	5760	3789	6960
Neivo-Rudyanskoye water basin	567	542	539	647	802	1302,5
Ayatskoye water basin	14	22	58	37	41	60
Total	3000	3150	5499	6444	4632	8322,5

Increase in water consumption occurred due to increase in water consumption by UECP JSC water consumers.

Table 3. Saving of process water due to recycling and reuse of water supply

2018	2019	2020	2021	2022
Volume of recycled and reused water, thousand m <sup>3</sup> /a				
155016	153726	165736	158523	159717
Percent of UECP JSC total volume of water withdrawal				
97	98	95	96	92

## 6.2 Discharges into open hydrographic system

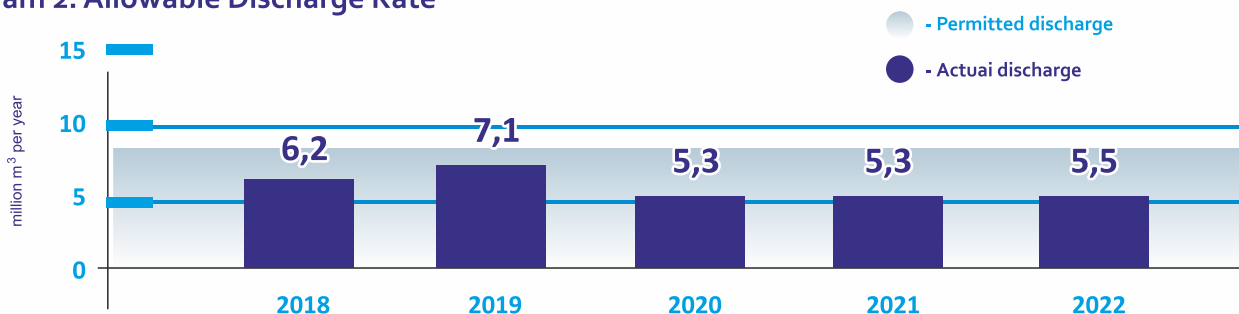
UECP JSC discharges wastewater through three discharge outlets. Permissible discharge limits (PDL) are established for every discharge outlet. The Ministry of natural resources of Sverdlovsk region issued “Decisions on the granting of water bodies for wastewater discharge”. According to «Decisions ...» UECP JSC has permit to discharge up to 8.3 million m<sup>3</sup> of wastewater into the surface-water bodies. According to in-process monitoring data, the actual volume of discharge in 2022 made 5.5 million m<sup>3</sup>. It is important to stress that the Company wastewaters fall under the category of partially clean water. The company does not perform off-schedule discharge. Obvodnoy channel on Bunarka River serves as water receiver. Pollutant content does not depend on the year average dryness.

Table 4. Wastewater composition by priority pollutants 2022

Priority pollutants	Class of hazard	ADL, t/a	Actual discharge, t/year
Petroleum products	3	0,6	0,4
Ammonia nitrogen	4	4,2	2,5
Nitrites	2	0,7	0,48
Phosphates	4	1,7	0,46
Total, only by basic substances			3.84

\*- according to the Federal Law dated 21.07.2014 № 219-FZ (as amended on 26.07.2019) "On revision of Federal Law On Environmental Protection" and certain legislative acts of the Russian Federation allowable discharge rates for these pollutants at UECP JSC facilities, are not established.

Diagram 2. Allowable Discharge Rate



Industrial water consumption in 2018-2019 has increased due to increase of water consumption by UECP JSC water consumers – Novouralsk industrial site facilities, and the amount of precipitation.

## 6.3 Radionuclides discharge

UECP JSC completed package of measures focused on terminating discharge of waste waters, containing radionuclides. This work resulted in termination of radionuclide discharge into surface-water bodies since 2006.



## 6.4 Chemical release

Actual release in 2022 made 25 tons, being at the same level as in 2018-2021.

Monitoring of the Company chemical release is performed according to annual “Chemical releases monitoring plan”, approved by UECP JSC Technical Director. The volume of other emissions shall be determined using duly approved procedures based on emission calculations as per specific indicators. UECP JSC chemical releases are within specified limits.

Diagram 3. Air Emissions

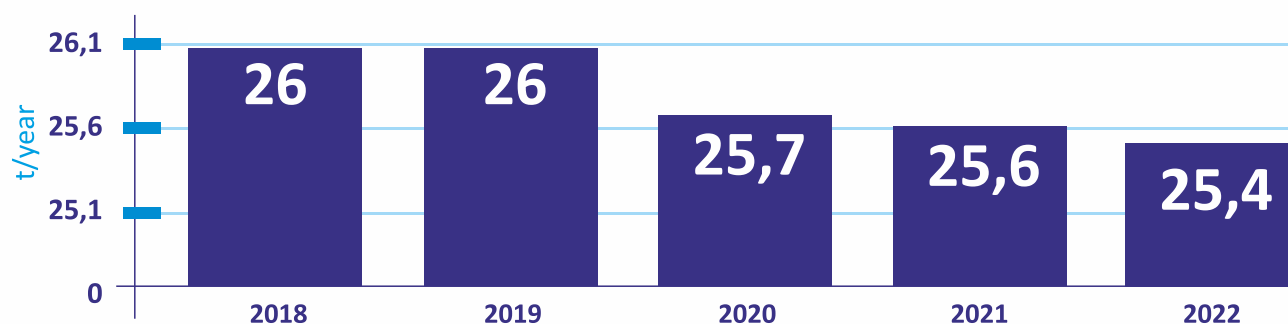


Table 5. UECP JSC chemical pollutant emissions

Вещество	2018	2019	2020	2021	2022
<b>Total</b>	<b>26.700</b>	<b>26.700</b>	<b>25.714</b>	<b>25.578</b>	<b>25.431</b>
including controlled pollutant sources	26,700	26,700	25,714	25,578	25,431
Solid	0.678	0.678	0.658	0.636	0.605
Gas and liquid pollutants, among them	25.392	25.392	25.056	29.942	24.826
Sulfur dioxide	0.141	0.141	0.134	0.096	0.018
Carbonic oxide	0.157	0.157	0.151	0.144	0.153
Nitrogen oxides (in-equivalent NO <sub>2</sub> )	0.327	0.327	0.326	0.244	0.320
Hydrocarbons (without VOC)	0	0	0	0	0
Volatile organic compounds (VOC)	10.045	10.045	9.723	9.736	9.612
Other gas and liquid pollutants	14.722	14.722	14.722	14.722	14.723
Persistent organic pollutants	0	0	0	0	0

### Additional information on ozone-damaging emissions 2022

Substance	Measuring unit	Amount	Use in technological process
Carbon tetrachloride	kg	17,6	Analytical investigation in the plant laboratory
Halocarbon-22	ton	11,8	Refrigerating equipment operation
Halocarbon-141V	ton	2,2	Equipment washing, degreasing

## 6.5 Greenhouse gas emissions

The calculations were made based on fuel balance as related to combustion of organic fuel, and based on material balance as related to accounting of other greenhouse gas emissions. CO<sub>2</sub> emissions were calculated taking into account combustion of natural gas, fuel oil, mineral oil, gasoline and diesel fuel used for motor transport. Increase in direct greenhouse gas emissions occurred for the first time in 2021 due to accounting of sulfur hexafluoride (SF<sub>6</sub> gas) emissions. Sulfur hexafluoride has the greatest, among greenhouse gases, global warming potential, and its contribution to the cumulative amount in UECP JSC direct greenhouse gas emissions prevails. Increase in indirect greenhouse gas emissions in 2021 occurred due to cold winter; average air temperature during the heating period was 8.2 °C lower as compared to 2020. Halocarbon emissions classified as greenhouse gases, from refrigerating stations owned by UECP JSC but taken on lease by RIR JSC Novouralsk Branch, were accepted by UECP JSC in 2022 under its area of responsibility. It caused significant increase in direct greenhouse gas emissions in 2022.

**Table 6. Direct & indirect greenhouse gas emissions**

	tons/year				
Material (substance)	2018	2019	2020	2021	2022
<b>Direct greenhouse gas emissions</b>					
For all types of emissions in CO <sub>2</sub> equivalent	145	79	74	2736*	13193
<b>Indirect greenhouse gas emissions</b>					
For all types of emissions in CO <sub>2</sub> equivalent	876353	885221	889288	892148	891492

\*- Based on greenhouse gas emissions inventory performed in 2021 according to "Uniform branch methodical guidelines..." of 28.12.2020 No 1/1634-P, the data on SF<sub>6</sub>-gas insulated electrical equipment emissions are included in this report. SF<sub>6</sub>-gas metering in greenhouse gas emissions influenced greatly on total amount of greenhouse gas emissions. In 2022, halocarbon emissions of refrigerating stations owned by UECP JSC but taken on lease by RIR JSC Novouralsk Branch, were accounted.

**Table 7. Greenhouse gas emission rate**

Material (substance)	2018	2019	2020	2021	2022
Total direct and indirect greenhouse gas emissions, ton	876353	885300	889362	894884	904685
Annual products and services revenue, mln rubles	22310	23560	22006	21080	22000
Intensity of greenhouse gas emissions /annual revenues from product sales, tons/mln rubles	39	38	40	42	41

### Nuclear industry contribution to the reductions of greenhouse gas emission

In estimating greenhouse gas emissions by the nuclear industry companies it should be mentioned that nuclear energy is classified as low carbon energy source. According to the forecast of International Energy Agency the share of low carbon sources in the global energy mix will make 40 % by 2040. Along with renewable generation resources, nuclear energy will become the integral part of low carbon energy mix.

Operation of all Russian-designed NPPs in the world prevents from emitting over 200 mln tons of CO<sub>2</sub>-equivalent per year, and particularly in Russia over 100 mln tons of CO<sub>2</sub>- equivalent.

UECP JSC covers ~ 20% of the global uranium enrichment demand. UECP JSC is involved in generation of every fifth nuclear power kilowatt under the sun, therefore UECP JSC saves the earth atmosphere from penetrating million tons of greenhouse gas into the environment.



## 6.6 Radionuclides release

The results of radionuclide emission monitoring are given in Table 8. According to the Table, UECP JSC radionuclides release meets the specified limits. Thus, the population dose rate from radionuclide inhalation does not exceed 0.005 mZv/year, which makes 0.5% of population dose limit.

Nuclide	Radionuclides release				
	2018	2019	2020	2021	2022
Total atmospheric release of long-lived alpha-active radionuclides, Gbq/year	0,079	0,073	0,065	0,062	0,058
Allowable release level, Gbq/year	0,3	0,3	0,3	0,61	0,61

## 6.7 Production and consumption waste management

UECP JSC does not process production and consumption waste. Waste resulted from UECP JSC operations are delivered for processing to the authorized companies under the existing contracts.

UECP JSC generated 3685 tons of production and consumption waste in 2022, 2234 (61%) tons of which made ferrous and non-ferrous scrap waste to be delivered for processing and to be returned to production facilities in the form of finished products.

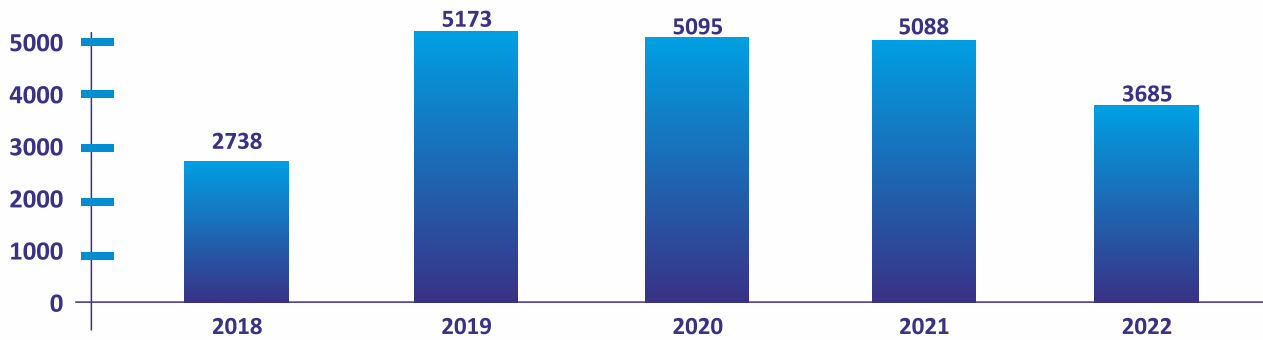
The metal scrap waste is delivered for processing and returned to production facilities in the form of finished products. In 2021 the processed production and consumption waste volume made 73% of total generated waste, in 2020 - 76%, in 2019 - 82% in 2018 - 95%.

The other types of waste produced by UECP JSC include:

- Solid municipal waste that starting from 2019 shall be delivered to the Regional operator according to the legislation.
- Production and consumption waste including rags, tree scrap material, waste lamps, oiled waste, sorbents shall be delivered for further processing or disposal to special facilities.

Pollutant	2018	2019	2020	2021	2022
Total waste generation Including:	2738	5173	5095	5088	3685
1st class	2	4	5	27	34
2d class	0	0	0	0	0,4
3d class	3	<1	18	80	1,6
4th class	129	817	1144	1236	1259
5th class	2604	4351	3928	3745	2390
Processed waste	2585	4260	3851	3646	2235
Delivered for storage and disposal	153	96	147	247	255
Solid municipal wastes delivered to regional operator	0	817	1097	1195	1195

Diagram 5. Generation of production and consumption waste, tons per year



## 6.8 Radioactive waste management

Solid radioactive waste (SRW) are generated at different stages of production process in operation of UECP JSC nuclear facilities. SRW fall under two types:

- low-level radioactive waste (<10% of total SRW volume)
- very low-level radioactive waste.

The most part of SRW volume generated in Company facilities is subject to processing for further compacting. After processing SRW packages shall be delivered to FSUE "NO RAO" SRW storage facility, which is safe and isolated from the environment. Decontaminated uranium-bearing solutions shall be processed using special technology. Upgrade of uranium-bearing solution processing technology in 2006 ensured reduction of the content and activity of radioactive substances in such solutions to the background levels, thus ensuring zero discharge of radioactive substances with wastewater.

In handling SRW UECP JSC is guided by radiation safety regulations and radiation protection requirements to ensure radiation safety of personnel, population and environment.

The major portion of UECP JSC generated solid radioactive waste (SRW) constitute waste from thermal breakdown of gas centrifuge units.

UECP JSC production is being continuously upgraded, therefore SRW volume is rather unsteady not only due to thermal breakdown of gas centrifuge units but also due to dismantling buildings, constructions and production facilities followed by construction waste generation.

UECP JSC became the first company in Russia possessing the full range of facilities and technologies making possible the complete SRW management cycle – from generation to preparation for final disposal. UECP JSC effectively operates SRW compacting and conditioning installation: waste breaking, burning, compaction, cementation, containerization.



Diagram 6. SRW generation

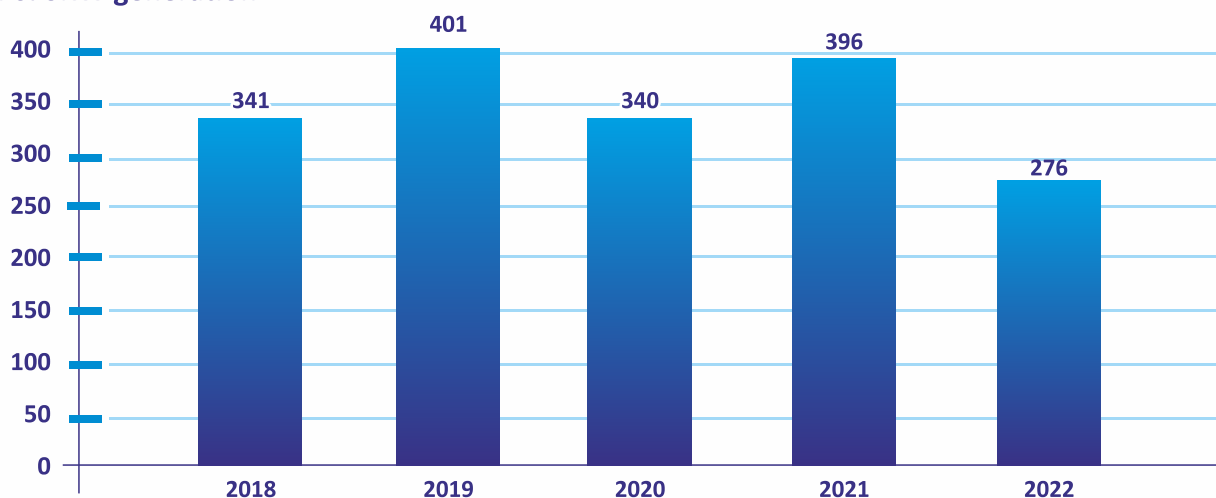
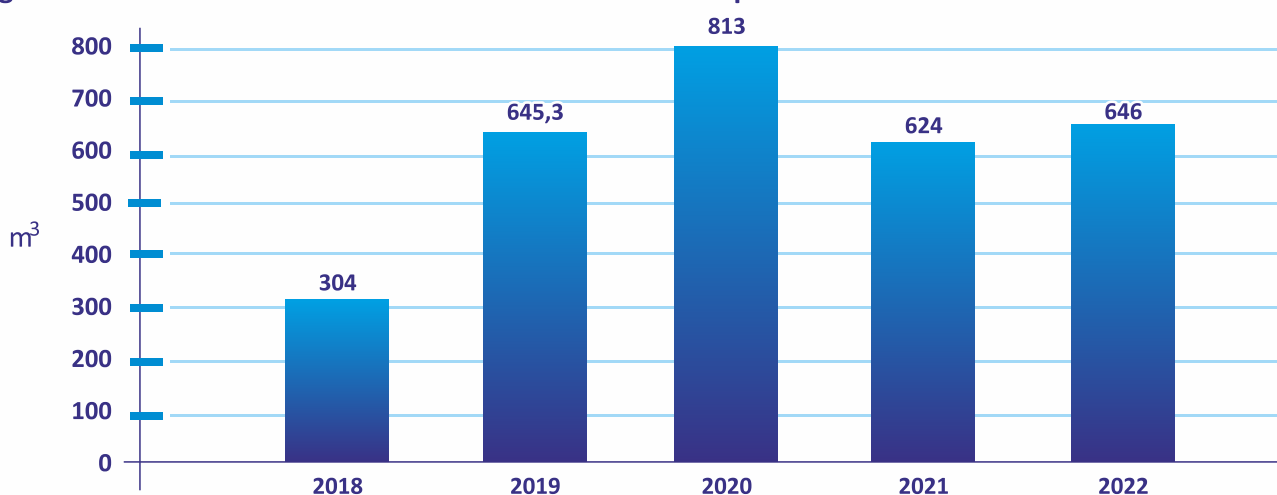


Diagram 7. SRW drums delivered to FSUE "NO RAO" for disposal



Based on research and development results UECP JSC developed the set of technical solutions concerning change of SRW processing flow-charts. Thus, by using new technologies UECP JSC:

- ceased generation of liquid radioactive waste
- ensured zero level of radionuclide discharge in surface water bodies
- designed, built and accepted for operation the isolated SRW storage facility that was placed in FSUE "NO RAO" service.
- developed new procedures for radioactive waste analytical control
- brought a batch of UECP JSC SRW waste into compliance with safety criteria for final disposal in 2016
- was the first in the RF to dispose of the batch of low-level solid waste.

SRW safe management infrastructure was established in Rosatom State Corporation Fuel Division



## 6.9 Energy use

UECP JSC is committed to introduction of energy-saving technologies and cost reduction. Based on the research made in 2020 UECP JSC developed, approved and introduced the "Program for energy saving and energy efficiency improvement for 2021-2025". The Program is focused on effective use of energy resources and reduction of energy losses resulted from changes in personnel behavior, and improvement of production process.

### Effective use of energy resources & energy loss reduction

UECP JSC has introduced and maintained operation of energy management system as per ISO 50001. UECP JSC developed and introduced the Energy policy.

The Company implements the pipeline of projects aimed to improve production infrastructure. The installed equipment is more energy-efficient and ensures flexible use of available capacities.

Process control and emergency protection system based on AKSU-3 was brought online in support process equipment of process shop 53.

The following actions were taken in 2022 for energy efficiency improvement:

- installing LED lamps instead of gas discharge lamps
- restoring thermal insulation on steam piping and hot water pipelines
- renewing worn out segments of water network
- replacing synchronous motor with low-powered asynchronous motor of station 250 refrigeration system.

Table 10. Energy consumption

	2018	2019	2020	2021	2022
UECP JSC power consumption, thousand kW/ h	1012306	1023411	1027874	1017639	1010726
UECP JSC thermal energy consumption, Gcal	627539	631946	626314	659288	667213
Total energy consumption, GJ	6279965	6330000	6322600	6423807	6432101

## 6.10 Share of UECP JSC in total volume of Sverdlovsk region emissions, discharge & waste

UECP JSC share in total volume of chemical pollutants (ChP), radionuclide emissions and discharge both in Sverdlovsk region and within the territory of Rosatom State Corporation enterprises makes less than 1 percent.

Table 11. Comparison of indicators with total volume within the territory

Indicator	Total volume within the territory	UECP JSC total volume	UECP JSC Share
ChP emissions, thousand tons	784,3*	0,025	< 0,003%
Discharge (volume of discharged waters), million cubic meters	655,8*	5,5	0,8%
Production and consumption waste, million tons	174,7*	0,0036	< 0,005%

\* - Total volume in Sverdlovsk region in 2021



## 6.11 Share of sold products and packing materials returned to producer for processing

UECP JSC production process allows for 100% return of packaging materials (vessels) to product manufacturer. Safety of purchased products and services is ensured by:

- incoming inspection and acceptance control
- specifying requirements for the suppliers.

When evaluating and choosing suppliers the following factors are taken into consideration:

- technical requirements for the supplied products and availability of regulatory documents specifying these requirements
- availability of documents proving conformity of product to ecological and environmental safety requirements (certificates of goods conformity and origin, safety and health certificates)
- availability of documentation confirming the product quality.

Contractor obligations on operations (activities) management in delivering products and services are specified in the contracts.

To improve the integrated management system the Company implements "Environmental protection and ecological safety requirements during work performance, product and service delivery by the contractors".

## 6.12 Financial aspects and other risks and opportunities for the Company in the context of climate change

In view of the slow rate of climatic changes, the Company management has performed no special quantitative evaluation of financial consequences in the context of climate changes in medium and long-term perspective.

Meteorological observations performed since 1960 show that temperature and wind regimes, amount of precipitations and their annual average are practically constant within UECP JSC activity area. Climatic and weather conditions are rather stable.

To minimize the weather damage risks the Company annually develops plans of activities focused on emergency prevention (flood protection, fire protection). These risks are regarded as extremely low considering the Company geographic location, existing statistical observations and actions taken to mitigate any possible climatic accidents.

## 6.13 Flora and fauna impact

Environmental monitoring demonstrates that the content of radionuclides in the environment is within the specified limits. The residents and the environment are not subject to UECP JSC radiation exposure. There were no cases of chemical pollution resulting from UECP JSC operations.

There are no specially protected natural areas of federal and regional significance within UECP JSC location areas. UECP JSC is not the locality for species listed in the Red Book and the national list of protected species.

- In August 2021, under the agreement with Nizhneobskoje Federal Agency for Fishery UECP JSC performed stocking the Ob river basin with fish (currently the baby fishes are growing up and their release into the river is planned for September 2021)
- In 2022, field study of aquatic biological resources was conducted to determine how many juvenile fishes of commercially valuable species could be released into the Verkh-Neivinsky water basin.

## 7 Implementation of environmental policy

Environmental safety issues are of high priority and importance for the development of nuclear technology and nuclear facility operations. Moreover, inspite of nuclear industry sustainable development, improvement of technology and safety, stabilization of nuclear industry is closely related to its ecological and social acceptability. At present it greatly depends on conditions ensuring reduction of radioactive waste volume, safe waste disposal, development of decommissioning technologies and solution of nuclear legacy problems.

UECP JSC scope of activity is of great strategic importance for the development of Novouralsk urban district, since it greatly contributes to its steady innovation progress. However, UECP JSC management understands the need for ensuring balance between strategic objectives of corporate business development and environmental safety, being the basis for life and health of present and future generations. One of the Company key tasks remaining vital for many years is to ensure the parity between the economic and environmental values. Practically it is ensured by technical upgrade, modernization and energy saving corporate programs, as well as detailed evaluation and minimization of potential environmental risks when implementing the new build projects. Improvement of environmental and energy efficiency is the mainstream of the Company strategy, the key element of environmental management system and environmental policy. UECP JSC advanced multilevel environmental management system is underpinned by qualified specialists and engineers and meets the modern criteria for management efficiency in this field. The complex approach to solution of problems addressed to conservancy and environmental protection enables UECP JSC to achieve all intended environmental purposes, minimize environmental risks and increase the social responsibility of business.

### **Katya Sokolova:**

**I'm working at Tenex JSC  
in Sustainable development  
and communication department.**

**I enjoy handicraft:  
knitting and knooking,  
creating textile dolls.**

***TENEX JSC supported the project  
for survey and monitoring of Amur leopard***





## 7.1 Initiatives on mitigating products & services environmental impact and the scope of mitigation measures

Operational safety of UECP JSC nuclear facility (NF) and its specific systems and components is ensured by steady implementation of defense-in-depth principle. Safety is ensured by application of physical protection system acting as a barrier on the way of ionization radiation, nuclear material and radioactive substance release to the environment, should it be the primary package (vessel, pipeline) wall or structure, frame or roof of any building. UECP JSC NF safety system includes protection of physical barriers, ensuring their operation within specified lifetime, personnel and environmental protection. For this purpose UECP JSC developed the complex of special measures to prevent emergency situations which may result in loss of containment (abnormality of process conditions, operation disturbance, self-sustained chain reaction, fire, dropping of goods, mechanical or corrosion damage, etc.), and radiological emergency release measures.

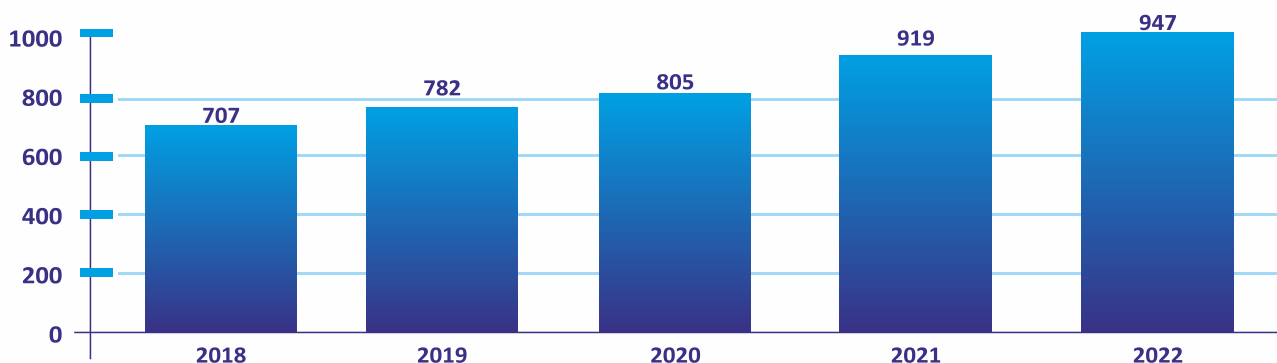
Safety level achieved by UECP JSC in NF operation and other activities in nuclear field are ensured primarily by the technical measures and decisions taken in the design of equipment, systems, NF components, and also by development of technological processes relating to nuclear material, radioactive substance and radioactive waste management.

**Table 12. Current environmental costs in 2022, thousand rubles.**

Type of environmental activity	Annual current (operating) costs	Payment for environmental service	Depreciation costs for the recovery of capital environmental assets	Turnaround costs for capital environmental assets
<b>Total</b>	<b>833 267</b>	<b>50 438</b>	<b>62 966</b>	<b>230</b>
including:				
air protection	144 309	873	11 909	29
collection and purification of waste water	311 040	46 143	17 419	55
waste management	3 145	3 307	-	-
environmental radiation safety	373 056	-	33 638	146
other environmental activities	1 717	115	-	-

UECP JSC environmental activity is focused on implementation of environmental impact reduction measures. UECP JSC environmental costs are basically connected with processing and purification of discharge and emissions and addressed to supporting technical and organizational activities. Environmental protection investment is generally made in upgrading equipment and waste processing facilities.

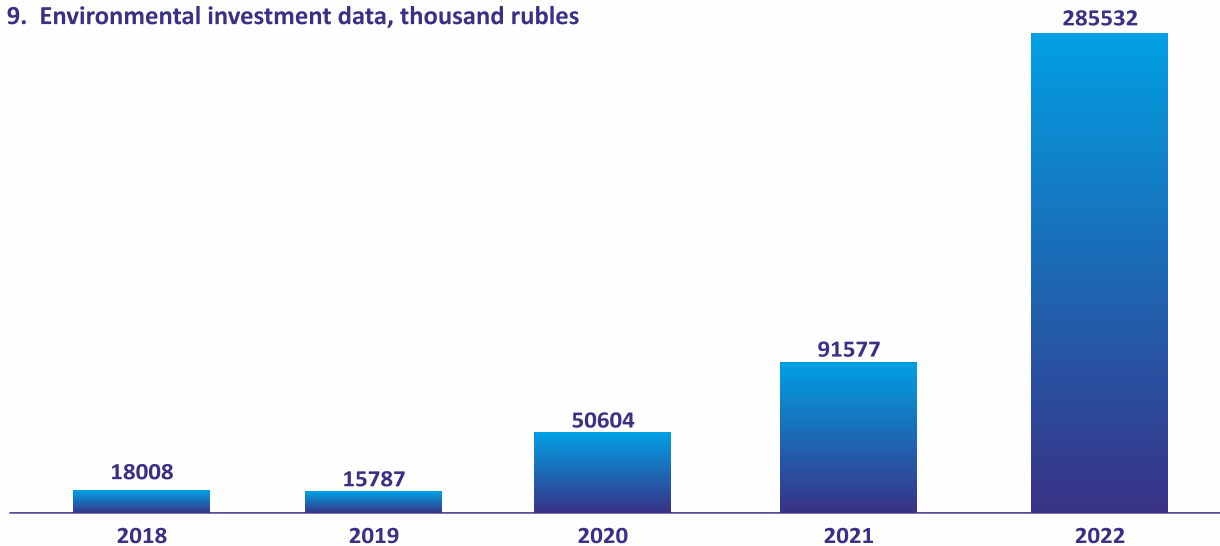
**Diagram 8. Current (operating) environmental costs and payment for environmental service, mln rubles**



**The cost increase in 2022 occurred due to:**

- SRW delivery to FSUE “NO RAO” for disposal
- increasing payment of services for industrial ecological monitoring of natural environment locations (including radiation monitoring)
- making contract with regional operator on solid municipal waste management.

**Diagram 9. Environmental investment data, thousand rubles**



**In 2022, environmental costs financed from capital investments made 285 532 thousand rubles**



**and included**

- replacement of gas purifying equipment
- designing uranium hexafluoride processing facility (W-UECP)
- development of discharge and workplace air radiation monitoring systems
- RW conditioning and intermediate storage facility project.

**Table 13. Environmental pollution payments, thousand rubles**

	2018	2019	2020	2021	2022
Pollution charge	169	152	111	86	159
water bodies	100	101	49	51	101
open air	42	2	2	2	2
waste disposal	27	49	60	33	56

\* The calculation was made in accordance with new requirements of the Russian Federation legislation in the field of environmental protection and production and consumption waste management.



## 8 Environmental education

### 8.1 Cooperation with public and local authorities

**The proper condition of UECP JSC nuclear, radiation, industrial, environmental and occupational safety was confirmed by many inspections conducted by executive authorities:**

- Urals Directorate of the Rostekhnadzor – as related to compliance with industrial safety requirements at UECP JSC hazardous facilities
- Urals Interterritorial Directorate for supervision of nuclear and radiation safety - as related to nuclear facility compliance with standards and regulations in nuclear field
- RF FMBA Regional office No 31 – as related to UECP JSC compliance with health legislation requirements.

UECP JSC management cooperates closely with Novouralsk urban district administration as related to environmental protection. UECP JSC employees jointly with Novouralsk urban district public authorities constantly perform landscaping, garbage collection, and various charitable activities.



#### **Katya Ignatova:**

**I joined Tenex JSC team in September 2022, and my PR experience within the industry makes 10 years.**

**I'm keen on sport, music and kids; and if you manage some event using the three components, you will get the energy boost for the year.**

***TENEX JSC provides support to environmental programs and projects:  
- Project for survey of white bear in the Russian Arctic Region***

## 8.2 Promoting public awareness

UECP JSC pays great attention to environmental education. The key principle of UECP JSC environmental policy is to ensure transparency and public availability of information related to environmental protection and safety activities. Tens of information materials are published annually in corporative, local, regional and branch mass media, highlighting the Company environmental activities and environmental conditions in the territory of presence.



In accordance with “transparency” policy pursued by UECP JSC, the Company annually organizes the ecological press-tours to the Company site for Novouralsk and Sverdlovsk region students, newsmen, bloggers and representatives of public organizations. The tour participants get unique opportunity to visit the Company process facilities, measure radiation background in any point of their route and make sure that the plant is environmentally friendly. Starting from 2008, the Company annually publishes Environmental safety report covering full and objective information on UECP JSC current environment conditions and environmental impact. Starting from 2012, Environmental Safety Reports have been publically presented to concerned regional public communities and Novouralsk citizens. The Report is delivered to organizations cooperating with UECP JSC on environmental protection and industrial safety, mass media and public organizations located in Novouralsk urban district, and is available on UECP JSC web-site ([www.ueip.ru](http://www.ueip.ru)). Furthermore, the news-bulletin of radiation situation in the territory of Novouralsk urban district is posted monthly on UECP JSC web-site.

Special section "Environmental situation" is available on UECP JSC social media pages.



UECP JSC management and specialists of environmental protection department are always ready to answer all questions related to the Company environmental activity and production ecological safety.



## 8.3 Cooperation with scientific and social institutions, population

Over 30 releases covering the Company environmental activity and state of environment at business site were published in corporate, city, regional and branch mass media in 2022.

The following events and actions are worth noting in 2022:

### Environmental protection department staff took part in:

- environmental campaigns and cleanup events in Novouralsk area
- sessions of Council for control and monitoring of radiation environment in Rosatom State Corporation organizations and Council for no radiation safety assurance procedures in Rosatom State Corporation organizations
- fourth research and practical conference "Environmental protection and radioactive waste management of scientific and industrial centres"
- annual branch research and practice seminar "Radiation safety and environmental protection in nuclear industry"
- signing the protocol of intentions to create educational and methodological platform to support and develop project activities of Novouralsk urban district high school seniors and students in "EcoStart" bio-bubble
- ceremony of awarding the winners and participants of municipal ecological creative works contest ""Kids are saying: "I love nature-2022"
- workshop in Novouralsk urban district Administration on "Developing utility and housing infrastructure and improving environmental safety"
- panel of judges at the conference "Final defense of "EcoStart" educational platform projects with presentation of engineering research works"
- panel of judges at the research and practical conference of "TechNoVivat!" engineering forum under "Rosatom School" project.

### Technical tours to UECP JSC production site were conducted for:

- students of "Ural Federal University (UrFU) named after the First President of Russia B.N.Yeltsin"
- students of Federal State Budgetary Educational Institution of Higher Professional Education "Moscow Pedagogical State University"
- members of "Citizens Union "Drugoe delo" public association
- UECP JSC employees hired in 2022.

**The "Sage ecology" contest was conducted among Novouralsk industrial site employees as part of "Safety traffic light" action.**



## Awards 2022

- UECP JSC was mentioned as prize winner of "Green owl-2022" municipal environmental contest in the nomination "Social environmental initiatives".
  - UECP JSC took the second place in "Environmentally model company of nuclear industry" sectoral contest.
- The letter of acknowledgement from Novouralsk urban district administration was addressed to UECP JSC for active cooperation on environmental protection, and participation in making environmental culture among the residents of Novouralsk urban district.

## 8.4 Guidelines for UECP JSC environmental protection and ecological safety

Pursuant to the current version of Environmental policy the main future tasks in the field of environmental protection and ecological safety are:

- provide an appropriate margin of readiness of manpower and resources to prevent and control any emergency situations, incidents, accidents and any other environmental emergencies
- ensure safe handling practices for depleted uranium hexafluoride
- improve resource and energy efficiency of production
- provide decommissioning of UECP JSC nuclear facilities being out-of-service
- reduce waste containing persistent organic pollutants
- regularly inform the Company personnel, citizens and other concerned parties of environmental and radiation situation and UECP JSC environmental impact.



### Nina Merten:

**My focus area at TENEX JSC is to develop new businesses, mainly lithium projects.**

**In my free time, I like to arrange the atmospheric trips to country retreats, picnics and explore old cities of rich history.**

***TENEX JSC provides support to environmental programs and projects: Project for study Red-Book animals and other particularly important faunal forms of the Russian Federation***



## Conclusion

In conclusion we note that neuronets have huge potential in ecology. They can contribute to the solution of many environmental safety issues, be used to analyze the environment contamination data, forecast of climate changes, define the most convenient routes for goods transportation and more. Owing to neuronets we can receive more exact and fast results that makes possible to take more effective actions for environment protection and preservation of natural resources. Thus, the use of neuronets in ecology is an important step towards sustainable and environmentally safe future.

Besides, neuronets can generate images which can be used for the analysis of ecological data. For example, neuronets are able to create images which show landscape or water resources changes. It can help scientists and ecologists to better understand the ecosystems and take more meaningful steps for their protection. Besides, neuronets can be used for creation of virtual ecosystems that may be used for testing various scenarios and forecasting future changes in the environment. Generally, the use of neuronets in ecology will help to improve our ability to understand and protect our planet. Below you can see the portraits of employees of nuclear sector as viewed by neuronet.

P.S.

Dear readers!

The text above was completely created by a neuronet without human involvement. It is quite possible that a few years later you will read the next UECP JSC environmental safety report generated completely by a neuronet. Let's see!



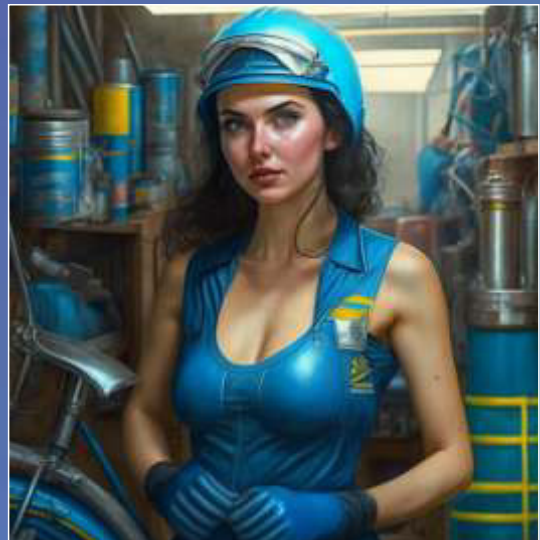
**Frame crane operator**



**Equipment operator**



**Specialist of environmental protection department**



**Technician of machine revision shop**



**Analyst-ecologist**



UECP  
ROSATOM



UECP  
ROSATOM

## Urals Electrochemical Plant

Joint Stock Company

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ENVIRONMENTAL  
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