WEB OF SCIENTIST: INTERNATIONAL SCIENTIFIC RESEARCH JOURNAL
ISSN: 2776-0979, Volume 4, Issue 12, December, 2023

HYGIENIC ASSESSMENT OF AIR QUALITY IN THE CITY OF NUKUS

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Abstract
Atmospheric air is an important element of the environment, which has Direct influence on human health [1].
Emissions from industrial, transport, energy and other manufacturing plants cause air pollution in major cities, and polluted air moves several thousand kilometers outside the city. According to the United Nations, 80-85 billion tons of fuel have been burned since the origin of life on Earth, half of which occurred in the last 25 years [2].

Keywords: sources of air pollution, dust, sulphur dioxide, carbon monoxide, ozone, phenol and ammonia

For Uzbekistan, air pollution is also one of the main environmental problems. Pollution of the republic's air is natural and anthropogenic. Let's consider the natural sources of pollution: on the territory of Uzbekistan there are large natural sources of dust ingress into the atmosphere - poorly fixed sandy soils and surfaces of salt marshes of the Karakum, Kyzylkum and Aralkum deserts (the drained part of the Aral Sea). The gross removal of sand and salts from the dried bottom of the Aral Sea alone reaches 40-45 million tons/year, and the main processes of dust-salt transport take place within 300 km of the coastal strip. Salt and dust storms from the Aral Sea have increased the level of suspended particles in the Earth's atmosphere by more than 5% [3].

Air pollution leads to the development of various diseases of the respiratory and cardiovascular systems, as well as worsens the quality of life of the population[2]. In the city of Nukus, located in the Republic of Uzbekistan, there is also a problem of air pollution , which is necessary for further study and improvement situations [4].

One of the main sources of air pollution in the city of Nukus is a brick factory, lime and graphite-marble plants (building materials industry), ABZ, DRSU-1 (motor transport enterprises), canning, wine, repair plants, Meat Processing Plant, DSK, JV LLC "Nukus Elektroapparat", JV LLC "Nukus Polymer".

The purpose of the study is to identify possible air quality problems that may negatively affect the health of Nukus residents and the environment, as well as todevelop recommendations for reducing the level of air pollutionand improving its quality in the future.

Materials and methods

The analysis of air pollution data in the city of Nukus was carried out on the basis of reporting data from the Monitoring Service for Pollution of the Atmosphere, Surface Waters and Soils of the Center for Hydrometeorological Service of the Republic of Uzbekistan.

The data was obtained with the help of automatic air quality monitoring posts located in different parts of the city.

Among the pollutants monitored were dust, sulphur dioxide, carbon monoxide, nitrogen dioxide, zota oxide, ozone, phenol and ammonia, as wellas heavy metals such as cadmium, lead, copper and zinc. The concentration of each pollutant was measured as a year average and a one-time maximum. In order to assess the compliance of the data obtained with the regulatory requirements, the maximum permissible concentrations established for each pollutant were used. For the analysis of the data, statistical processing was used, including calculations of the average and maximum values, as well as the relationship with the MPC.

Results and Discussion

The city of Nukus is the capital of the Republic of Karakalpakstan. The population in 2018 was 310 thousand people. The area of the city of Nukus is 221 km2.

The city has an agricultural and construction industry, an airport, a railway junction and a bus station.

The city of Nukus is located in the lower reaches of the Amu Darya, on its right bank at an altitude of 80 m above sea level. From the east, the sands of Kyzylkum come close to the city. To the south-east of the city there are the Sultan-Uwais mountains up to 473 m above sea level, to the south of the city stretch the sands of the Zaunguz Karakums, to the west - the vast Ustyurt plateau.

Climate: sharply continental, hot, dry summers and comparatively cold snowless winters.

Air quality: Observations are carried out at 2 stationary posts of Uzhydromet. Methodological guidance is provided by the Air Pollution Monitoring Service, Surface Water and Soil Pollution.

Posts are divided into: "industrial" – near enterprises (post No. 7), "auto" – near highways or in areas with heavy traffic (post No. 5). This division is conditional, since the development of the city and the location of enterprises do not allow for a clear division of districts.

Dust concentrations: The average concentration for the year was 0.2 mg/m3, exceeding the average daily MPC by 1.3 times. The maximum one-time concentration was recorded at post No. 7 in May and amounted to 5.9 mg/m3, exceeding the maximum one-time MPC by 11.8 times. ISA = 1.61.

Sulfur dioxide concentrations: The average concentration for the year was 0.009 mg/m3 (0.2 MPC s.s.) and the maximum one-time concentration was 0.019 mg/m3 (0.0 MPC). ISA = 0.19.

Carbon monoxide concentrations: The average carbon monoxide concentration for the year was 2 mg/m3 (0.7 MPC s.s.), the maximum one-time concentration was 5 mg/m3 (1.0 MPC m.r.). ISA = 0.83.

Nitrogen dioxide/nitrogen oxide concentrations: The mean nitrogen dioxide concentration was -0.02 mg/m3 (0.5 MPC s.s.). The maximum one-time concentration was 0.04 mg/m3 (0.5 MPC). ISA = 0.35.

The average annual concentration of nitric oxide was 0.02 mg/m3 (0.3 MPC s.s.). The maximum single dose was 0.03 mg/m3 (0.1 MPC).

ISA = 0.26.

Concentrations of specific impurities: The average annual phenol concentration was 0.001 mg/m3 (0.3 MPC s.s.) and the maximum one-time concentration was 0.004 mg/m3 (0.4 MPC). ISA = 0.34.

The level of air pollution is low. ISA = 3.39.

Number of days exceeding the MPC s.s.

Admixture	Number of days
Dust	136
Sulphur dioxide	0
Carbon monoxide	0
Nitrogen dioxide	0

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Characteristics of air pollution in Nukus Annual data

Admixture	Post	QCP.	G	qm	q	qi	n
Dust	7	0,2	0,382	5,9	3,0	0,0	896
Sulphur dioxide	5	0,010	0,003	0,018	0,0	0,0	891
	7	0,009	0,003	0,019	0,0	0,0	891
Carbon monoxide	7	2	1,098	5	0,0	0,0	891
Nitrogen dioxide	5	0,02	0,008	0,04	0,0	0,0	891
	7	0,02	0,007	0,04	0,0	0,0	891
Nitric oxide	5	0,02	0,005	0,03	0,0	0,0	891
Phenol	5	0,001	0,001	0,004	0,0	0,0	891
	7	0,001	0,001	0,004	0,0	0,0	891
ИЗА (5) = 3,39							

Findings:

1. The level of air pollution in the city of Nukus is due to emissions of harmful substances from stationary and mobile sources, as well as the high climatic potential of air pollution.
2. The average dust concentration for the year was 0.2 mg/m3, exceeding the MPC by 1.3 times. The maximum one-time concentration was recorded at post No. 7 in May and amounted to 5.9 mg/m3, exceeding the MPC by 11.8 times. ISA = 1.61.
3. The content of heavy metals in the air of the city of Nukus exceeded the maximum permissible values.
4. Air pollution cannot but affect human health and causes an increase in the number of chronic respiratory diseases, bronchial asthma, chronic bronchitis, allergic diseases, shortness of breath, lung cancer, cardiovascular diseases, skin and eye diseases. Therefore, monitoring of atmospheric air pollution determines and adjusts the direction of recreational activities.

In 2018, the level of air pollution, characterized by the air pollution index, was low in all cities of the republic, including the city of Nukus.

To improve the pollution situation Atmosphere in Nukus it is necessary accept row Measures aimed at Reduction of emissions Polluting substances into the atmosphere.

For example It is necessary to pr in the case of the Sheriff's T ecologically Clean Views transport, such as electric vehicles, and Also carry out modernization equipment on the industrial enterprises for reduction inFor example, if you want to be a member of a group In Atmosphere. Besides It is necessary to prCalling the system Recycling debris and take measures to reduce dust pollution Load in the city.

Such In a way that does not Looking on Positive outcomes Atmospheric pollution Air is a serious problem for the city of Nukus, which has a negative impact on the Impact on health Population. DIn order to improve the situation, it is necessary accept Measures Aimed on diminution Emissions Polluting Ves For example, if you want to be a member In Atmosphere, and Also to carry out work along Cleaning inair and dust reduction Load

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