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**ЭКОЛОГИЧЕСКАЯ ОЦЕНКА ОБЪЕКТОВ РАЗМЕЩЕНИЯ ОТХОДОВ
ТЮМЕНСКОЙ ОБЛАСТИ**

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**ENVIRONMENTAL ASSESSMENT OF WASTE MANAGEMENT
FACILITIES IN THE TYUMEN REGION**

Аннотация. В статье пойдет речь об отходах производства и потребления, о том, какие меры учета используются на территории Российской Федерации, а также о деятельности в области обращения с отходами производства и потребления и о способах захоронения отходов, а именно об объектах размещения отходов. Какие объекты существуют на территории Тюменской области, в каких объемах образуются отходы, их распределение по видам деятельности. Представлено деление районов по степени благоприятности.

Ключевые слова: Отходы, отходы производства и потребления, коммунальные отходы, объекты размещения отходов, территория, Тюменская область.

Abstract: The article deals with production and consumption of wastes, measures of accounting in the territory of the Russian Federation. Also activities in the field of waste management of production and consumption and ways of waste disposal and facilities are discussed. Objects existed in the territory of the Tyumen region, waste volumes, their distribution by types of activity are examined. The division of regions according to the degree of auspiciousness is presented.

Key words: Waste, production and consumption waste, municipal waste, waste disposal facilities, territory, Tyumen Region.

At present, the problem of recycling production and consumption wastes is just as acute as reducing emissions into the atmosphere and discharges into water bodies. To address this issue, the world community adopted the Basel Convention. The main goal, which is the protection of the environment and human health from the harmful effects of hazardous waste [1].

In the current legislation, production and consumption wastes are usually referred to as "substances or objects that are formed in the process of production, performance of work, and the provision of services or in the process of consumption, which are removed, intended for disposal or are subject to disposal".

Waste generated in residential premises in the process of consumption, as well as goods that were used to meet personal and domestic needs, be called solid communal. They also include waste similar in composition, but formed from the activities of legal entities and individual entrepreneurs [3].

To account for production and consumption wastes, there is a special procedure for conducting the state cadastre of waste. The completed procedure for the collection, processing, processing and processing of information on the types and types of waste, their origin, component or chemical composition, aggregate state and physical form, hazard class, conditions and specific waste disposal sites, technologies for the use and disposal of various waste species.

The state cadastre of waste includes:

- The Federal Classification of Waste Catalog, which is a list of types of waste in circulation in the Russian Federation and systematized according to their classification characteristics: origin, conditions of education (belonging to a certain production, technology); chemical or component composition, aggregate state and physical form.

- The State Register of Waste Disposal Facilities includes a set of systematized information on existing storage and disposal facilities that meet certain requirements established by the legislation of the Russian Federation.

- The waste data bank and the technologies for the use and disposal of waste of various types contain detailed information on the types of waste included in the Federal Classification of Waste Catalog, their characteristics, as well as information on technologies used to disinfect and use waste [5].

All waste products of production and consumption shall be collected, stored, transported, processed, disposed of, disposed of, in accordance [2] with conditions and methods that are safe for the environment and the population.

The collection of waste is the reception of them from outside organizations. The licensee, i.e. a legal person or an individual entrepreneur who has a license, accepts waste registered in the logbooks formed as a result of economic activities of economic entities [3].

Transportation of waste is the movement of them by means of a vehicle by a legal person or an individual entrepreneur outside the territory of the land plot that is owned or used by him. Transportation can be carried out under the following conditions: the presence of a waste passport; availability of transport means specially equipped and equipped with special signs; compliance with safety requirements for the transport of waste on vehicles; availability of documentation for the transport and transfer of waste, indicating the amount of waste, the purpose and destination of their transportation [3].

Waste treatment means the preliminary preparation of these wastes for further disposal, including sorting, disassembly, cleaning. Waste treatment can be a stage of

their utilization, as a result of which a secondary material resource is formed, subject to technological change for the production of products or services in the process of utilization.

Waste utilization is the use of these wastes for the production of goods or products, the performance of work, the provision of services, including the recycling of waste (recycling), the return of waste to the production cycle after a certain preparation (regeneration) and recovery of useful components, for their reuse (recovery).

Waste neutralization is a reduction in the mass of waste, a change in its composition, physical and chemical properties, to reduce the negative impact of waste on the environment and human health.

Waste disposal means storage and disposal for more than 11 months in a specially equipped facility. An indication that the object in which the waste is placed is the object of disposal of waste that meets the requirements of the law is its registration in the State Register of Waste Disposal Facilities [3].

Requirements for environmental protection in the processing of production and consumption wastes are prohibited: waste disposal in settlements, recreational areas, forest parks, sanatoriums and water protection zones, in catchments, underground water bodies used for drinking purposes and domestic and domestic water supply, and burial of waste in places of occurrence of minerals and mining industry in case of threat of pollution of places of origin of minerals.

Under the current environmental legislation of the Russian Federation, facilities for the disposal of production and consumption wastes are specially equipped waste disposal facilities, including waste storage facilities and waste disposal facilities. Such objects can be polygons, storehouses of suspensions, barns for sludge, tailings, dumps and others [2].

Waste disposal facilities that comply with environmental, sanitary and epidemiological standards are entered in the State Register of disposal facilities. At sites not listed in this register, waste disposal is prohibited. The requirements for waste disposal facilities, as well as for the location of solid municipal waste, are established

by the federal executive authority responsible for state regulation in the field of environmental protection.

In order for the waste disposal site to be included in the State Register, the following documentation should be developed and approved: license; characterization of the object of waste disposal; project documentation [3].

In addition to waste disposal facilities, those facilities that are authorized and unauthorized waste storage sites, ie, waste dumps. At the same time, the concept of "waste dump" as an object of waste disposal is not fixed in normative legal acts [6].

The territory of the south of the region belongs to the West Siberian Plain and occupies 1/9 of the territory of the entire Tyumen Region. The predominant forms of relief are the groove-hollow and the lake-hollow. The climate is continental, with low temperatures in the winter, strong winds and excessive moisture in the summer. In the south of the Tyumen region there are more than 5100 rivers and streams belonging to the Irtysh basin and over 42 thousand lakes, which in total occupy an area of 4.0-4.5 thousand km². The following types of soils are distinguished on the territory of the region: soddy-weakly podzolic; gray forest solodized; dark gray forest solodized gley; floodplain meadow; meadow chernozem solodized; meadow-marshy. The communities of the boreal such as vegetation, which form various combinations and alternations of forest, marsh and meadow phytocenoses. In the Tyumen region 318 municipal formations have been allocated, including 5 city districts, 22 municipal districts, 292 rural settlements. Significant development has the following industries: electric power, mining mineral resources, oil refining, chemical industry, and engineering, production of building materials, timber and woodworking, light and food industries, as well as agriculture [9].

One of the main sources of environmental pollution in the territory of the Tyumen region is wastes from production and consumption of all hazard classes. In 2010, the least amount of wastes of I-IV hazard classes is observed, while in 2015 the ratio of waste of I-IV hazard classes to waste of V hazard class tends to a ratio of 1:1. Despite this, for the period from 2010 to 2015, V class hazard wastes prevail, which

are characterized as practically non-hazardous. This distribution is associated with the characteristics of production in the Tyumen region [12-17].

In connection with the specifics of industrial production, according to the regional waste cadastre, the following wastes of production and consumption are not generated in the Tyumen Oblast: mining waste of metal ores; waste products of leather, leather goods; waste of metal productions; waste in the production of hydroelectric power, pumped storage power plants; waste in the production of energy from renewable sources.

The total volume of waste generated in the territory of the Tyumen region, by source of education is divided into consumption waste (housing and communal services), production waste and agricultural waste. To date, information on the management of production and consumption wastes for 2015 is more relevant. According to this, the share of agriculture accounts for 20% of the total volume of production and consumption, the share of the housing and communal sector accounts for 15.2%, and for the production share - 61.2%, respectively [12-17].

An actual problem for the south of the Tyumen Region is the activities for handling waste from the cleaning of territories in winter (contaminated with oil products and other waste snow masses). Snow from the cleaning of the territories is exported to special "sites for temporary storage of waste". The given concept, in the current legislation of the Russian Federation is not established. Also for such storage areas there are no environmental requirements, they are regulated by construction norms, in which norms are prescribed for calculating the snow load on the area of the landfill.

Due to the fact that snow does not belong to waste that has a shelf life of at least 11 months, it is quite difficult to monitor such sites. When operating these sites, this type of waste is formed as "waste from snowmobile stations" (7 312 110 00 00). Contaminated snow is recognized as a class IV waste, while the group still does not contain any specific species with a confirmed hazard class.

In 2015, a solution was proposed to solve the problem of snow utilization by melting with the help of a snow melting unit [7]. But due to the fact that there is a large

number of vehicles and other pollutants in the cities, snow has exceeded many indicators, especially for chlorides and petroleum products. Also in the exported snow mass was a rather large content of small solid household waste. This, in turn, had an impact on the snow melting unit and clogged the cleaning grids. The administration of the region had to refuse this method of snow utilization.

Activities in the field of waste management of production and consumption in the territory of the Tyumen region are carried out through neutralization or disposal at own enterprises, transfer to outside enterprises for disposal or disposal, as well as placement of solid municipal (household) wastes or landfills.

In the field of waste production and consumption management, in the period from 2010 to 2015, there was a certain dynamics of reduction of solid municipal (household) and industrial waste disposed of in landfills and an increase in the number of recycled (neutralized) wastes. The number of reporting economic entities that provided information on production and consumption wastes for five years increased from 2,551 to 5,205, i.e. has doubled. This contributed to an increase in the indicator for the total amount of waste generated. Which in 2010 amounted to 1,229.2 thousand tons, and by 2015 this figure almost doubled to 2,830 thousand tons. During this period, the amount of recycled waste increased by 5.5 times, which is explained by the specifics of production of the Tyumen region and types of waste generated.

Despite the fact that by 2014 the total amount of waste is increasing, and by 2015 it is somewhat reduced, more attention is being paid to the utilization or neutralization of waste, which reduces or eliminates the harmful impact on the environment. So, in 2015, 69.3% of wastes were disposed of and rendered harmless, while in 2010 their share was only 28.6%. Accordingly, according to the indicator of waste disposal (decontamination) in 2015, 30.7% of the total volume of waste generated is accounted for by landfilling [12-17].

Also in the Tyumen region, a transition to a new procedure for the management of production and consumption wastes has been initiated through the implementation of the Waste Management Concept, which excludes the disposal of unsorted waste at landfills. So, for example, in the city of Tyumen, in the courtyards of houses,

specialized containers for separate collection of waste began to appear, namely, baskets for plastic. The implementation of the Integrated Strategy is carried out through the optimization of logistics and the development of infrastructure in this area, which is necessary for the preliminary preparation of production wastes and consumption for final disposal, including equipped sites for the accumulation of waste and waste transfer stations that reduce the transportation distance.

In this regard, the Tyumen Region will be divided into four sectors, each of which will have a closed cycle of the waste management system, i.e., a system in which all the necessary two-level infrastructure for organizing the collection, transportation and processing of production wastes and consumption, within one sector.

The first level of this system is realized in the territorial boundaries of municipal districts and city districts. It is connected with the organization in their territories of the collection and transportation of all production and consumption wastes.

The second level of this system is associated with the movement of waste from the territory of municipal entities to intermunicipal waste-processing plants.

Utilization of production and consumption wastes, which are secondary material resources, will be carried out at enterprises operating in the Tyumen region or transported to specialized enterprises outside the region.

The issues of waste management in the Tyumen region are being resolved within the framework of the Concession Agreement regarding the creation of an infrastructure for processing and utilization of production and consumption waste. In accordance with it, in 2015, four scrap processing plants in the cities of Tyumen, Tobolsk, Ishim and Yalutorovsk were designed. It also provides for the construction of two waste transfer stations in the Tyumen region and in Tyumen. The planned infrastructure will allow processing up to 80% of waste within the region [4].

In the Tyumen region, all waste disposal facilities are being registered, it is carried out through the inventory of waste disposal facilities, excluding reclaimed or abandoned sites, as well as storage sites for specialized waste.

In accordance with the inventory conducted in the period from 2010 to 2015, there is a tendency to decrease the total number of waste disposal sites, due to a

reduction in the number of landfills, sludge collectors, sludge barns, as well as landfills and TCO landfills. This is due to the fact that many waste disposal facilities do not meet modern ecological, sanitary-epidemiological, and hygienic, fire requirements and standards, become unprofitable and cease to exist [12-17].

At present, waste that cannot be disposed of and rendered harmless is located in landfills that are nature protection facilities and are intended for centralized collection, disposal and disposal of wastes [8]. They provide protection against soil, atmosphere, surface and groundwater pollution, and also prevent the spread of pathogens.

The location of polygons is carried out on a territorial basis and is envisaged in the development of schemes and projects of the district planning. When landfills are buried at the landfill, their layered high-altitude location is applied, which allows to save considerable space and increase the service life, as well as to prevent the entry of harmful substances into the environment.

The location of production and consumption waste in the Tyumen region is carried out at the waste disposal facilities included in the State Register of Waste Disposal Facilities. The transfer of these wastes for disposal is carried out on a contractual basis by specialized enterprises that accept these wastes in accordance with the existing license for activities related to waste of I-IV hazard classes. On the territory of the region, there are 21 polygons for the placement of solid municipal (household) wastes [12-17].

The largest number of polygons is located in the Tyumen region (3) operating organizations are OOO Tyumen Ecological Association, which collects, transports, processes, utilizes, neutralizes, places waste of I-IV hazard classes; LLC MUP Vinzilinskoye Housing and Communal Services, which collects, uses, neutralizes, transports, places waste mainly in the 4th class of danger; OJSC "Fort-tum", which carries out activities for neutralization and placement. Also, two polygons are located in the Uvat district, they are exploited by the following companies: Progress-2 LLC and Municipal Unitary Enterprise Demian Municipal Enterprise of the Uvat Municipal District; in the Yalutorovo region, the operating organizations of the landfills are OOO Tyumen Ecological Association and OOO Service Plus, in the territory of

Zavodoukovskiy District the companies operating the landfills are Municipal Unitary Enterprise Zavodoukovskoe Housing and Municipal Unitary Enterprise Ivanovo Utility Company of the Uvat Municipal District. In 6 districts of the Oblast (Abatsky, Armizonsky, Aromashevsky, Nizhnetnavdinsky, Omutinsky, Yarkovsky) there are no polygons for waste production and consumption waste.

The largest landfill is the landfill site located in Tyumen along the Velizhansky tract, which accepts wastes from I to IV class of danger. The area of its territory is 30 hectares. The smallest in area is the legion located in the Uvat municipal district, in with. Pershino. The area of its territory is 1 hectare.

According to the projected capacity, the largest is the polygon in Tyumen - 333545 m³ / year, and the smallest in the Tyumen municipal district, in the village of Vinzili - 16.13 m³ / year. These landfills are included in the State Register of Waste Disposal.

Due to the fact that in many municipal areas there are no or only one landfill, sanctioned and unauthorized sites for storing wastes (landfills) are formed.

Authorized waste disposal sites (landfills) are waste storage sites for which there are any documents confirming the provision or withdrawal of local land authorities by the local government for the location of the facility, but do not comply with the norms of sanitary and epidemiological and environmental legislation. They are temporary and are subject to adjustment in accordance with the requirements or closing after the expiry of the service life.

Unauthorized waste disposal sites (landfills) are sites that are used, but are not intended for waste storage, i.e. not assigned in accordance with the established procedure for the location of waste storage by an act of choice of a land plot, an order or a resolution of the local administration that is not the property of the enterprise operating the landfill, and also does not comply with sanitary and epidemiological and environmental legislation [6].

Considering that at present all waste production and consumption waste disposal sites (authorized and not authorized landfills) do not comply with environmental requirements, their use for the disposal of waste is prohibited.

Despite this, as of the beginning of 2016, there were 587 dumps in the Tyumen Oblast, including 407 authorized dumps and 180 unauthorized dumps. The largest number of sanctioned sites (46) is located in the Abatsky municipal district, and the smallest (1) in the Tyumen and Tobolsk. In Yalutorovsk and Ishim there are no sanctioned sites. Unauthorized sites prevail in Golyshmanovsky and Ishim municipal districts (25), in Isetsky and Yalutorovskiy municipal districts, as well as in Tyu-no, Ishim and Yalutorovsk. Such areas are absent [12-17].

Due to the fact that these sites (landfills) do not comply with the norms of sanitary and epidemiological and environmental legislation, they have a negative impact on the environment and human health.

In dumps, in addition to solid municipal (household) waste, waste products of food are placed, which decompose, they release biogas. Methane and carbon dioxide, which form the basis of biogas, belong to greenhouse gases. Biogas contains a large number of toxic organic compounds, which are a source of unpleasant odor and can serve as a fire hazard, which also negatively affects the environment.

Due to the lack of waterproofing in landfills, pollution of soil and groundwater occurs. When storing waste, a filtrate is formed, which, passing through a large mass of waste, is saturated with toxic substances that are part of the waste or are the products of their decomposition. It focuses on organic and inorganic compounds, as well as heavy metals. When it enters the soil and water, this leads to pollution of the environment not only by harmful compounds, but also by pathogenic microorganisms. Given that many unauthorized sites in the Tyumen region are located near agricultural land, it is possible to deteriorate the quality of soil fertility, as well as food. The entry of filtrate into surface and ground water leads to a deterioration in their quality and possible disease of the population, they are used for drinking needs.

Also, dumps represent a sanitary hazard, since they are a favorable environment for the life of pathogenic microflora (tuberculosis, typhoid fever, dysentery, etc.) as well as parasitic fauna, carriers of infectious diseases, rodents and flies.

In addition to other waste disposal facilities, on the territory of the Tyumen region there are 13 sites for storing snow that is exported from the territories of

municipalities. All snowmobiles are located in the territories of urban districts. A large number of them are located in the territory of Tyumen and the Tyumen Region, they are active, except for one - a backup one.

According to the size of the square, the biggest place for storing snow is the site in Tobolsk, which is 23 hectares in size. It is a quarry with wastewater treatment by natural filtration. The smallest is a quarry in Ishim. Its area is 1 hectare.

In terms of capacity, the largest site is the quarry in Tobolsk, it is 210000 m³. And the smallest - in the urban district of Tyumen, in the village of Dorozhny. Its capacity is 20100 m³; this site is not used and is a reserve site [12-17].

All snow polygons of the south of the Tyumen region do not have waterproofing, which is a major violation in the field of operation of waste disposal facilities, as well as the sanitary and epidemiological welfare of the population.

Based on the available data, an ecological analysis was carried out based on the method of ballistic assessments to identify a territory with unfavorable conditions. In the basis of the method of ball judgments, three criteria were laid down, each of which was evaluated on a scale. The maximum number of points that could be scored was 8 points. After the evaluation of each criterion separately, they are summed up, and the score of the territory is assessed based on the environmental situation, this estimate is based on comparison with other areas of the region. After receiving the sum of points, the ranking is performed: 4-5 - critical state; 6-7 - stress state; 8 - satisfactory condition. According to the assessment of the territory of the region, a satisfactory situation in the field of waste management of production and consumption is formed in the following areas: Tyumen, Yurginsky, Uvatsky, Tensioned state is observed in the districts: Armizonsky, Aromashevsky, Berdyuzhskiy, Vikulovsky, Zavodoukovskiy, Nizhnetnavdinsky, Omutinsky, Sorokinsky, Tobolsk, Uporovsky and Yalutorovsky. A critical situation develops in eight districts of the region: Abatsky, Vagay, Golyshmanovsky, Ishim, Isetsky Kazan, Sladkovsky, Yarkovsky.

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