

WORKING OUT OF A MEDICAL WASTES TREATMENT SYSTEM IN THE ODESSA REGION

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The problem of medical waste management is extremely urgent. Medical wastes are considered and evaluated as a factor in not only direct but also indirect risk of emergence of infections and noncommunicable diseases among the population through the possible contamination almost of all components of environment – water, air, soil, food, hospital's environment. Potentially infected wastes of medical institutions represent an epidemiological danger.

Today the system of gathering, removing, recycling and treatment of medical wastes is far from perfection in Ukraine. Only very small part of hospital wastes is subject to processing and disposal. And bigger part from them goes to containers with municipal wastes and then they are taken out to the landfill of solid domestic wastes.

Taking to notice all the above-said, I believe that the problem of medical waste management is also urgent for our region, especially in the face of shrinking land taken over by landfills. About 2452 tons of medical wastes are formed every day in Ukraine. Every year hospitals of Odessa region accumulate about 16764 tons of medical wastes of which 25% are dangerous according to statistics.

Besides that, there is no accounting of quantity of medical wastes which are formed in pharmacies, by consumers and other sources.

But the waste treatment problem is displayed not only by their quantity. In this study, we used the method of tree-like clusterization of statistic data for association similar to certain characteristics administrative districts of the region into separate clusters. As a result have been obtained 13 clusters of indicators such as the mass of waste, number of beds in the stationary department of health facilities and the number of polygons in each administrative district.

In conditions of reducing of lands taken over by landfills it is necessary to find another way to waste disposal, which also provide epidemiological welfare of population.

In this research we propose a thermal method to remove the medical wastes of classes A, B, C because it can be implemented centrally. For waste disposal in the Odessa region Ltd. "Green-port" uses an incinerator In-50.4 Russian production. Also recommended for use pyrolysis incinerator "Muller" French production type HP 500.

Mentioned equipment are designed for high temperature removal of any combustible waste. This method of waste treatment ensures the 4th class of danger of ash and total destruction of organic components and viruses.

Considering technological and technical parameters of each of the incinerators, it can be concluded that the main difference between an incinerator "Muller" and the In-50.4 is the principle of waste incineration - pyrolysis (incineration unit with a lack of air in the combustion chamber). This ensures that dioxins will not form, which are superecotoxicants that's why they can't be contained in the air even at concentrations that do not exceed the respective MPC on these substances. At the same time emissions of In-50.4 contain dioxins in the amount of 0,1 ng/m³. It is for this reason, in the choice of equipment preference was given to the incinerator HP 500. This incinerator is highly reliable. If any parameter exceeds current European standards, the system inhibits the loading phase.

In providing conditions of completely removing waste hazard, a choice of optimal technology and equipment is carried out by the criterion of economic efficiency. That's why an indicator of ecological-economic efficiency of the implementation of environmental activities was calculated. This calculation includes the damage that has been defined by the method of determining the damage caused by pollution and contamination of land and violation of environmental legislation because the end product of medical waste treatment provides his placement in the environment which is associated to negative influence on earth surface and soil, especially within the limits of valuable topsoil. Thus, the ecological-economic efficiency indicator was 4,43 when medical waste treatment with the In-50.4, and 4,14 hryvnia per each hryvnia capital investment for incinerator HP 500.

Based on annual productivity incinerator and annual accumulation of medical waste for each district (the number of administrative districts in the region is 26) was found the number of incinerators needed to service the Odessa region, equal to 14.

The main features of placement incinerators is possibility to use one equipment by few districts depending on the mass of medical wastes produced there. According to Sanitarian rules and norms 5179-90 estimated sanitary protection zone HP 500 incinerator is 100 meters from

residential buildings. Surface concentration of pollutants taking into account the background will not exceed the established.

The achievement of epidemiological and ecological safety of administrative districts in Odessa region is expected due to implementation the results of this work through complete removal of infected and potentially infected MW from solid domestic waste stream which are placed on landfills and through destruction of pathogenic microorganisms from their volume. Besides, wastes volumes that are formed by medical institutions will be reduced by 98% of now existing what will contribute to conserve lands from growing landfills.

With providing the proper waste sorting or separate gathering in places of their accumulation is possible to recover the heat by production of hot water, electricity, vapor, conditioning of the air what will decrease a term of capital costs absorbtion to equipping the incinerator complex and eventually will bring additional income.

Establishing an effective system of medical waste management in the districts of Odessa region will reduce the level of the epidemiological risk and improve the conditions of environmentally safe existence of the population., 2004-408 p..