

**Environment Impact
ASSESSMENT
Sludge Thermal Treatment Plant in Krakow**

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SUMMARY IN NON-SPECIALIST LANGUAGE

The aim of this Assessment is to identify, document and determine the environmental impact and nuisance of the Sludge Thermal Treatment Plant (STUO) located in Krakow-Płaszów. The implementation of this project, i.e. of the sludge thermal treatment plant, will represent the final stage of the modernisation of the waste-water system of City of Krakow. The STUO will thermally treat the sludge produced in the Krakow waste-water treatment plants, i.e. in both the collective (Płaszów and Kujawy) and local systems.

The area where the waste produced during waste-water treatment was stored so far, i.e. over 18 hectares of sludge lagoons located in the immediate vicinity of the treatment plant, was closed. The construction and execution designs envisage that this area will be subjected to the land reclamation process.

The waste produced in waste-water treatment is currently forwarded to the authorised external recipients for further management. To continue using this solution would eventually mean a necessity to remove approximately 90 000 Mg of waste from the City of Krakow. In addition, this solution makes MPWiK S.A. [Krakow Water Company] heavily depend on external recipients and does not guarantee safety in a long-term perspective.

The thermal treatment installation will treat 64 Mg of dry weight of sludge per day; the sludge will mainly come from the Waste-Water Treatment Plant Płaszów II and the Waste-Water Treatment Plant Kujawy. The installation will operate continuously, 24 hours per day for a minimum of 8 000 hours per year. The time of a single standstill of the installation may not exceed seven days. The sludge thermal treatment installation will meet the BAT requirements.

The Sludge Thermal Treatment Plant will be located in the middle part of the premises of the waste-water treatment plant Płaszów II, next to the facility for mechanical dewatering of sludge, which is currently under construction. The area of approximately 9.500 m², of currently uncultivated land, has been allocated for the construction of the complex of the STUO facilities.

The environmental impact assessment of the planned project analyses all elements of the environment and their interconnections for the stages of the construction, operation and a possible closure. Because of the character of the planned project, it has been concluded that the negative impact on the environment during the operational phase can involve the following main elements:

- emissions to the air,
- a threat to the acoustic environment, [and]
- the management of the residue produced in the process.

The calculations presented in the Assessment suggest that the selection of an efficient system of flue gas cleaning at the design stage, and in relation to this system, of the appropriate parameters of releasing flue gas into the atmosphere will allow ensuring that the emission standards for this installation type, in particular the standards concerning the quality of the environment (air) outside the premises of the treatment plant, are met. It will be possible without the releasing of extremely high parameters of pollutants to the air on the one hand, and without a necessity to establish the area of restricted use on the other hand.

The analysis takes into account another main source of air pollutants which will exist on completion: a boiler house and (additionally) the installation producing electricity – both powered with biogas. The analysis also takes into account the emission related to the movement of internal and external means of transport taking place on the premises of the treatment plant.

The designed facilities related to sludge thermal treatment and also (eventually) to a generator house will not affect the acoustic impact of the treatment plant. This is because the majority of noise-producing equipment will be housed within a building with the appropriate sound insulation of walls. According to the analysis contained in the Assessment, the combined impact of the facilities (the equipment of the treatment plant, STUO, the generator house and other) will not cause the exceedance of the allowable equivalent sound level in the areas protected against noise: 55 dB for the day-time and 45 dB for the night-time.

It is envisaged that technological water (treated waste-water) and municipal water, of the volume of a hundred and several dozen cubic metres per hour, will be used in STUO. The waste-water produced in the STUO (municipal waste-water, cleaning and maintenance waste-water, and rainwater) will not cause any particular contamination, and as such, it can be discharged straight to the sewer system. However, the waste-water produced in the wet cleaning of flue gas may require pre-treatment.

All the waste produced in the Installation will be sent to the beginning of the waste-water treatment network. The assumed discharge of waste-water, in the volume and of the quality described in the Assessment, does not pose a threat to the quality of the operation of the treatment plant.

No negative impact of the installation on groundwater is predicted. The most important solutions guaranteeing the effective protection of the soil and water environment during the operation of the incinerator are:

- the construction of the leak-proof surfaces of vehicle manoeuvre areas, roads, parking spaces and the floors in the incinerator room and storage rooms,
- the waste-water and rainwater intake and its transport in the sewer system to the waste-water treatment plant,
- the storage of the waste destined for thermal treatment and the products of incineration in the appropriate storage rooms, bunkers, big bags, etc.

The by-product of the process of sludge thermal treatment is the waste: fly ash, combustion ash and the residue produced in the flue gas cleaning, which mainly is the non-combusted mineral part of sludge. The technological solutions selected for STUO allow decreasing the stream of waste destined for landfills by nine-fold, which will definitely decrease the surface areas required for landfilling.

The residue produced in the process of the flue gas cleaning, such as filtration cakes among other things, must be treated as hazardous waste due to the accumulation of heavy metals, polychlorinated dioxins and furans. This waste may be stored unprocessed in hazardous waste landfills only. It is envisaged that this stream of waste will undergo solidification to the form of the granulated product in the designed STUO installation. The granules will be moved onto self-unloading trailers in big bags, and then taken to the temporary waste storage area. If tests for heavy metal leaching confirm its usefulness, this waste will be collected by the services of MPWiK S.A. in order to be used in the sewer system rehabilitation.

Fly ash and combustion ash will be transported to the place where it can be of industrial use or to landfill. It is allowable to use the residue of thermal waste treatment to produce concrete mixes for the construction industry, although not for the buildings to be permanently occupied by humans or animals, subject to obtaining positive results during the testing for heavy metal leaching.

The predicted impact of the planned STUO on the health of the residents in the neighbourhood will be insignificant. This is because the larger residential housing is located at the considerable distance from the planned investment project (Nowy Bieżanów Estate: over 1.5 km to the south of the planned STUO). The closest individual buildings (single-family housing) are located 500 m and over 500 m from the STUO facilities in Danatówka Street.

The insignificant number of buildings located nearby results in the insignificant mass-impact, which, as this Assessment indicates, falls within the value limits for particular components of the human environment, including e.g. noise limits or value limits for concentrations in the air as regards human health protection.

The implementation of the project will not have a negative impact onto the natural environment in the vicinity of the waste-water treatment plant. The flora and the world of animals of the discussed area are not particularly diversified because of the way the environment has been used in this area so far. The impact of the planned STUO on the world of plants and animals will be mostly related to the emission of pollution to ambient air, soil and surface water, from which it can be taken by plants and animals.

Considering the scale and the impact zone as well as the significant distance between the plant and the closest areas of the NATURA 2000 Network (approximately 10 km between Niepołomicka Primeval Forests from the planned investment project), it must be stated that it has no impact on the protected area.

In addition, the protection areas of habitats: Dolina Prądnika, Dolinki Jurajskie, Koło Grobli and Lipówka are located completely outside the impact zone of the analysed investment project.

There are no historical monuments protected according to the regulations on monuments' protection and conservation in the immediate vicinity of the construction of STUO or within the immediate impact zone of the planned project.

It is recommended to carry out an audit after at least one year of the operation, which would compare the data contained in the Environmental Impact Assessment and the environmental approval with the actual environmental impact of the project and the measures taken to reduce it.

The audit would allow for the better analysis of the interactions within the natural environment, and hence it would allow avoiding the same mistakes during the process of assessing the environmental impact.

To recapitulate, the development of the waste-water treatment plant Płaszów II in Krakow by the sludge thermal treatment installation will allow integrating the process of waste-water treatment and solving the problem of sludge management, which is the waste produced in this process.

STUO will also be an important part of sludge treatment in the Krakow agglomeration, which solves the problem of sludge management in all waste-water treatment plants managed by MPWiK S.A. in a complex approach.

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