ENVIRONMENTAL IMPACT ASSESSMENT STUDY

NON-TECHNICAL SUMMARY

OF THE PROJECT FOR THE CONSTRUCTION OF THE WASTE-TO-ENERGY PLANT AT CP NO. 1420/1, 1420/4, 1491/1, 1541/1, 1541/2, 5824/1, 6513/1, 6513/2 C.M. PRAHOVO AND PHASED CONSTRUCTION OF THE LANDFILL FOR NON-HAZARDOUS WASTE WITHIN THE CHEMICAL INDUSTRY COMPLEX "ELIXIR PRAHOVO" ON CP NO. 2300/1, 1491/1 AND 1541/1 C.M. PRAHOVO, NEGOTIN MUNICIPALITY

Project Holder:
ELIXIR CRAFT DOO
Hajduk Veljkova 1, 15000 Šabac

Study Processor:
ELIXIR ENGINEERING DOO
Hajduk Veljkova 1, 15000 Šabac
License No.: 000221880 2023 14810 010 000 000 001

Belgrade, March 2025

Project Holder:	**COMPANY FOR MECHANICAL ELECTRICAL AND CONSTRUCTION WORKS ELIXIR CRAFT DOO ŠABAC** Hajduk Veljkova 1, 15000 Šabac
Facility:	**WASTE-TO-ENERGY PLANT, CP No. 1420/1, 1420/4, 1491/1, 1541/1, 1541/2, 5824/1, 6513/1, 6513/2 C.M. PRAHOVO** **LANDFILL FOR NON-HAZARDOUS WASTE, CP No. 2300/1, 1491/1 AND 1541/1 C.M. PRAHOVO** **WITHIN THE ICP ELIXIR PRAHOVO COMPLEX** Braće Jugovića No.2, 19330 Prahovo
Name and designation of the project part:	**NON-TECHNICAL SUMMARY – ENVIRONMENTAL IMPACT ASSESSMENT STUDY OF THE PROJECT FOR THE CONSTRUCTION OF THE WASTE-TO-ENERGY PLANT AT CP NO. 1420/1, 1420/4, 1491/1, 1541/1, 1541/2, 5824/1, 6513/1, 6513/2 C.M. PRAHOVO AND PHASED CONSTRUCTION OF THE LANDFILL FOR NON-HAZARDOUS WASTE WITHIN THE CHEMICAL INDUSTRY COMPLEX "ELIXIR PRAHOVO" ON CP NO. 2300/1, 1491/1 AND 1541/1 C.M. PRAHOVO, NEGOTIN MUNICIPALITY**
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Responsible person:	Nenad Milutinović
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	ElixirEngineering Elixir Engineering DOO Hajduk Veljkova 1, 15000 Šabac, Srbija 10
Project leader:	Jadranka Radosavljević, M.Sc. in Eng.
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Number of part of the design:	23-WTE-SPUŽS-01
Place and date:	Belgrade, March 2025

ENVIRONMENTAL IMPACT ASSESSMENT STUDY

NON-TECHNICAL SUMMARY

OF THE PROJECT FOR THE CONSTRUCTION OF THE WASTE-TO-ENERGY PLANT AT CP NO. 1420/1, 1420/4, 1491/1, 1541/1, 1541/2, 5824/1, 6513/1, 6513/2 C.M. PRAHOVO AND PHASED CONSTRUCTION OF THE LANDFILL FOR NON-HAZARDOUS WASTE WITHIN THE CHEMICAL INDUSTRY COMPLEX "ELIXIR PRAHOVO" ON CP NO. 2300/1, 1491/1 AND 1541/1 C.M. PRAHOVO, NEGOTIN MUNICIPALITY

Consent of the Investor **COMPANY FOR MECHANICAL ELECTRICAL AND CONSTRUCTION WORKS ELIXIR CRAFT DOO ŠABAC** **DIRECTOR OF THE COMPANY FOR THE OPERATION OF THE ECO ENERGY BRANCH**	**Study Processor:** **ELIXIR ENGINEERING DOO** **DIRECTOR**
Dragan Stanojević	Nenad Milutinović

Elixir Craft DOO
Ogranak Eco Energy
Braće Jugovića 2, 19330 Prahovo, Srbija

ElixirEngineering
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Hajduk Veljkova 1, 15000 Šabac, Srbija

Belgrade, March 2025

CONTENTS

LIST OF TABLES

LIST OF FIGURES

1.0. INFORMATION ON THE PROJECT HOLDER AND THE CONTRACTOR

Project holder data

Name of Enterprise:	COMPANY FOR MECHANICAL ELECTRICAL AND CONSTRUCTION WORKS ELIXIR CRAFT DOO ŠABAC
Short name	ELIXIR CRAFT DOO
Address:	Hajduk Veljkova 1, 15000 Šabac
Registration No.	21417092
TIN:	111037913
Activity code:	4399 – Other unspecified specific construction works
Responsible person	Dragan Stanojević, Director of the Eco Energy Branch Company
Telephone number:	+381 69 805 3060
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The company for mechanical, electrical and construction works Elixir Craft d.o.o. Šabac (hereinafter: Elixir Craft), was established in 2018 as a member company of the Elixir Group Business System from Šabac. Elixir Craft is a company responsible for the construction and maintenance of facilities, plants and equipment in accordance with standards, regulations and technical regulations. The Elixir Craft team consists of professional and motivated employees of different profiles who have the state-of-the-art equipment and expertise necessary to provide services in the field of maintenance and construction of industrial facilities and plants.

In order to launch and develop a completely new business activity, in 2023 company Elixir Craft d.o.o. has established a new business unit - the **Eco Energy branch**, which is registered with the Business Registers Agency (activity code: 3822 – treatment and disposal of hazardous waste), with its registered office at Braće Jugovića No., 2, in Prahovo, Negotin Municipality.

Contractor data

Name of Enterprise:	ELIXIR ENGINEERING DOO ŠABAC
Short name:	ELIXIR ENGINEERING DOO
Address:	Hajduk Veljkova 1, 15000 Šabac
Registration No:	20222123
TIN:	104713960
Activity Code:	7112 – Engineering activities and technical consulting
Responsible person:	Nenad Milutinović, Director
Contact person:	Jadranka Radosavljević, lead designer in the field of environmental protection
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Elixir Engineering is a company specialized in the development of project-technical documentation. The team consists of engineers with extensive experience in the industry, at all stages of the project, from concept formation to commissioning and plant management.

1.1 Introduction

Waste management represents the general social interest in the Republic of Serbia, and is regulated by the Law on Waste Management. This Law and by-laws adopted on the basis of this Law are aimed at ensuring and securing conditions for waste management in a way that does not endanger human health and the environment.

The current situation in waste management in the Republic of Serbia is such that certain types of waste are generated in larger quantities for which no treatment is provided, which creates a problem for both waste producers and operators who undergo complicated and slow export procedures. By signing the Basel Convention, the Republic of Serbia undertook to take appropriate measures to ensure the availability of adequate disposal facilities for environmentally acceptable management of hazardous and other waste, which will, as far as possible, be located within the country, as well as to ensure that the cross-border movement of hazardous waste and other waste is minimized.

In order to establish a long-term waste management system in a way that has a minimal adverse impact on the environment and the health of present and future generations, and with rational use of resources and respect for the principles of waste management, the Regional Waste Management Plan for the cities of Zaječar and Bor and the municipalities of Boljevac, Kladovo, Majdanpek, Negotin and Knjaževac included the construction of Waste-to-Energy Plant.

The Waste-to-Energy utilization is envisaged as part of the decarbonization strategy of the Elixir Group, i.e. the reduction of the carbon footprint that comes from the use of fossil fuels (mazut, coal and CNG) currently used to obtain thermal energy in the production and technological processes of the Elixir Prahovo complex. This Elixir Group strategy fits into the strategy of EU countries, which aims to reduce GHG emissions and implies that only a small percentage of waste is disposed of in landfills, and the largest percentage of waste is treated in appropriate plants, including thermal treatment, thus reducing its volume and obtaining sustainable local energy.

The project of energy recovery of waste will be implemented by the construction of the Waste-to-Energy Plant, which consists of a plant for thermal treatment and energy recovery of non-hazardous and hazardous types of non-recyclable waste, closed warehouses for solid and liquid waste, lines for physical and mechanical pretreatment of waste intended for thermal treatment, a plant for stabilization and solidification of residues from thermal treatment and residues from dry and wet flue gas cleaning, as well as other accompanying facilities necessary for the performance of the subject activity. The Waste-to-Waste-to-Energy Plant is an integral part of the Eco Energy complex, which, in addition to the Waste-to-Energy Plant, also includes the Landfill for non-hazardous waste.

In order to ensure the safe supply of waste suitable for thermal treatment and avoid the accumulation of waste at the Waste-to-Energy Plant site, the working units of the Elixir Group Business System (Eco Lager Šabac and Prahovo), registered to perform waste storage activities, will store waste according to the types and characteristics of waste, pack the waste in an adequate manner and, in accordance with the needs, dispatch it to the Waste-to-Energy Plant. Only those quantities of waste that are necessary for the smooth operation of the plant will be stored at the site of the Waste-to-Energy Plant, without long-term storage and accumulation of waste.

Based on the available technical documentation, measurement of environmental parameters, site visit and legal regulations, the multidisciplinary team of the company ELIXIR ENGINEERING DOO, whose composition is determined by the decision on the formation of a multidisciplinary team, has prepared a Environmental Impact Assessment Study in order to define potential impacts and determine the necessary environmental protection measures, in order to prevent negative consequences on the environment during regular work, and in cases of possible accidents.
The Environmental Impact Assessment Study of the project in question also presents a description of the potential impact on environmental factors in the territory of Bulgaria and Romania, bearing in mind that it is a project subject to the obligations of the impact assessment procedure in a cross-border context.

2.0. DESCRIPTION OF THE LOCATION PLANNED FOR THE PROJECT EXECUTION

The Project Holder ELIXIR CRAFT plans to build an Eco Energy complex in Prahovo, Negotin municipality, within the chemical industry complex in Prahovo, which will consist of the plant for Waste-to-Energy utilization (Waste-to-Energy Plant), as well as the Landfill for non-hazardous waste for the disposal of solidificates.

2.1 Macro-location

The municipality of Negotin is located in the north-eastern part of Serbia and extends along the border of Serbia, Bulgaria and Romania. The total area of the territory of the municipality of Negotin amounts to 1,090km^2 , which is 1.9% of the total area of the territory of the Republic of Serbia and is ranked seventh in terms of area and includes 39 settlements. Prahovo is an industrial settlement of compact type located about 9 km northeast of Negotin. The geographical position of Prahovo is significant due to the proximity of the Danube. It is located at an average of 60 meters above sea level, on the right bank of the Danube. Figure 2.1 on the left shows the settlements of the municipality of Negotin, and the figure on the right shows the position of the settlement of Prahovo on the map of the Republic of Serbia.

Negotin municipality settlements *Prahovo settlement on the map of the Republic of Serbia*

Figure 2.1

The Eco Energy complex (Waste-to-Energy Plant and Landfill for non-hazardous waste) together with the existing Elixir Prahovo complex and the Phosphea Danube DOO complex, as well as a part of the land that is in the immediate vicinity with the project in question, are located within the chemical industry complex in Prahovo, within the limits defined by the Detailed Regulation Plan (DRP), with a total area of about 321 ha.

According to the Detailed Regulation Plan, the future Eco Energy complex is an integral part of the Technological Unit C – Zone IV: Energy and Ecological Island, within which the construction of facilities for the purpose of providing thermal and cooling energy and electricity is allowed, including a thermal treatment plant for non-hazardous and hazardous industrial waste, non-recyclable municipal waste and residue from municipal wastewater treatment. Within this zone, the construction of areas/facilities and infrastructure systems that are in the service of temporary storage, treatment and disposal of waste and residues from the thermal treatment plants is allowed. The Detailed Regulation Plan provides for the possibility of connecting future facilities of the Eco Energy complex to all existing and planned infrastructure lines of the chemical industry complex in Prahovo.

The subject location of the Eco Energy complex is located next to the bank of the Danube (at a distance of about 500 m in the north direction from the plant border), near the port of Prahovo, in the area of C.M. Prahovo, which belongs to the municipality of Negotin. The Danube River flows in a west-east direction and at the same time represents the state border with Romania.

The following industrial and economic complexes are also located in the environment of the Eco Energy complex:

- Elixir Prahovo complex in the direction of west and north along the plant border,
- Port of Prahovo and River Shipping Krajina, at a distance of about 700 m in the north-west direction from the plant border,
- Phosphea Danube DOO – at a distance of about 900 m west of the plant boundary,
- NIS petroleum products warehouse, at a distance of about 950 m from the plant border in the north-east direction from the plant border,
- Hydro power plant "Djerdap II", at a distance of about 4.5 km in the direction of the west.

The proximity of the port and the railway line provide the chemical industry complex in Prahovo, in addition to the road, with the possibility of river and railway transport. The Port of Prahovo is an international port that is capable of receiving, transhipping and shipping all types of cargo, whether in bulk or packaged condition in the amount of two million tons per year.

In the immediate vicinity of the future Eco Energy complex, i.e. the Waste-to-Energy Plant and the Landfill for non-hazardous waste there are no residential facilities. The settlement of Prahovo is located at a distance of about 2 km in the direction of the west, the village of Radujevac is located at a distance of about 4 km in the east-southeast direction of the project in question, the settlement of Samarinovac, at a distance of about 5 km in the southwest direction, the settlement of Srbovo, at a distance of about 6 km in the south direction, the settlement of Dušanovac, at a distance of about 7 km in the northwest direction, and the settlement of Negotin, at a distance of about 10 km in the southwest direction. Along the border of the expansion of the chemical industry complex in Prahovo, at a distance of about 1,300 m from the future Eco Energy complex in the west direction, there is a workers' settlement (a smaller group of residential buildings).

Figure 2.2 shows the macro-location of the Waste-to-Energy Plant and the Landfill for non-hazardous waste.

Figure 2.2 Macro-location of the Waste-to-Energy Plant and Landfill for non-hazardous waste

According to the 2022 census, 799 inhabitants live in the settlement of Prahovo, while 735 inhabitants live in the settlement of Radujevac, and 28,261 in the municipality of Negotin. The population density in the municipality of Negotin is 26 inhabitants/km^2. The average age in Prahovo is 50.68 years, and the Radujevac settlement is 56.33 and both settlements have a predominantly adult population. According to the official data of the Statistical Office of the Republic of Serbia, there are 332 households with an average number of 2.41 members in Prahovo.

The location where the Eco Energy complex is planned to be built is at a distance of about 750 m from the border with Romania. On the other side of the Danube, on the Romanian side, there is undeveloped land. The Romanian settlements closest to the site in question are:

- Izvoarele is located at a distance of about 4 km, north of the location in question. According to the census, 951 inhabitants live in the settlement.
- Gruja is a settlement in Romania, the seat of the municipality of Gruja. It is located in the Mehedinci district, in Oltenia at a distance of about 7 km, east of the site in question. According to the census, there were 1,890 inhabitants in the settlement.

The location of the project in question is at a distance of about 9 km from the Bulgarian border. The nearest Bulgarian settlements are:

- Balej, a village in the northwestern Bulgarian municipality of Bregovo, in Vidin District is located at a distance of about 10.5 km from the site in question. According to 2011 estimates, Balley had a population of 437 inhabitants.
- Kudelin, a village in northwestern Bulgaria also, in the municipality of Bregovo in the Vidin District, is located at a distance of about 10.6 km from the site in question. According to the 2021 census, the village had 229 inhabitants.

2.2 Micro-location

In terms of micro-location, the construction of a Waste-to-Energy plant is planned within the chemical industry complex in Prahovo at CP No. 1420/1, 1420/4, 1491/1, 1541/1, 1541/2, 5824/1, 6513/1, 6513/2, while the phased construction of the Landfill for non-hazardous waste is planned on CP No. 2300/1, 1491/1 AND 1541/1 C.M. PRAHOVO

The location of the future Eco Energy complex directly borders the following existing facilities:

- Phosphogypsum Storage – south, belonging to the Elixir Prahovo complex,
- Waste railway sleeper warehouse, non-hazardous waste warehouse and concrete base – north, belonging to the Elixir Prahovo complex
- Wastewater treatment plant of the chemical industry complex in Prahovo – west, which belongs to the Elixir Prahovo complex,
- Unconstructed land – west,
- Land intended, by DRP amendments, for the expansion of the production part of the industrial complex (towards Radujevac), for the formation of a chemical park, a new production complex of the same or compatible activity, with the necessary accompanying, technologically and functionally related facilities, with several independent units, with new Investors – toward east.

Therefore, directly along the eastern boundary and south of the future waste-to-energy plant lies agricultural land that has been devastated due to long-standing industrial activities in the area. The socially-owned enterprise IHP Prahovo was established in 1960, initially as a superphosphate factory, i.e., as the chemical division of the metallurgical complex in the Bor basin. In August 2012, Elixir Group d.o.o. Šabac privatized part of the IHP Prahovo assets and subsequently founded the member company Elixir Prahovo – Industrija hemijskih proizvoda d.o.o. Prahovo (Elixir Prahovo), which, in the following period (up to 2015), successively privatized all industrial facilities previously belonging to various legal entities of the former holding company IHP ad Prahovo.

The operation of the industry in the IHP Prahovo complex prior to its privatization in 2012, as well as poor waste management during the period when pesticides were produced at the complex (an activity that has not been carried out for more than 15 years), resulted in the creation of "historical pollution" with negative environmental consequences.

As a result, the surrounding land is no longer suitable for agricultural activities. Most of this land has been purchased by Elixir and other legal entities, while a smaller portion remains owned by private individuals.

Following significant construction-technical and technological interventions at the Prahovo chemical industry complex after its privatization in 2012, including the remediation of locations where hazardous waste had been improperly disposed of, and due to the migration of pollutants over time, coupled with physicochemical and biological processes in the soil and groundwater, today only localized pollution is registered in the part of the complex designated for expanded activities. This pollution is inconsistent in terms of origin and type.

Figure 2.3 provides an orthophoto image of the micro-location of the waste energy recovery plant (Waste-to-Energy Plant) and the Landfill for non-hazardous waste within the chemical industry complex in Prahovo.

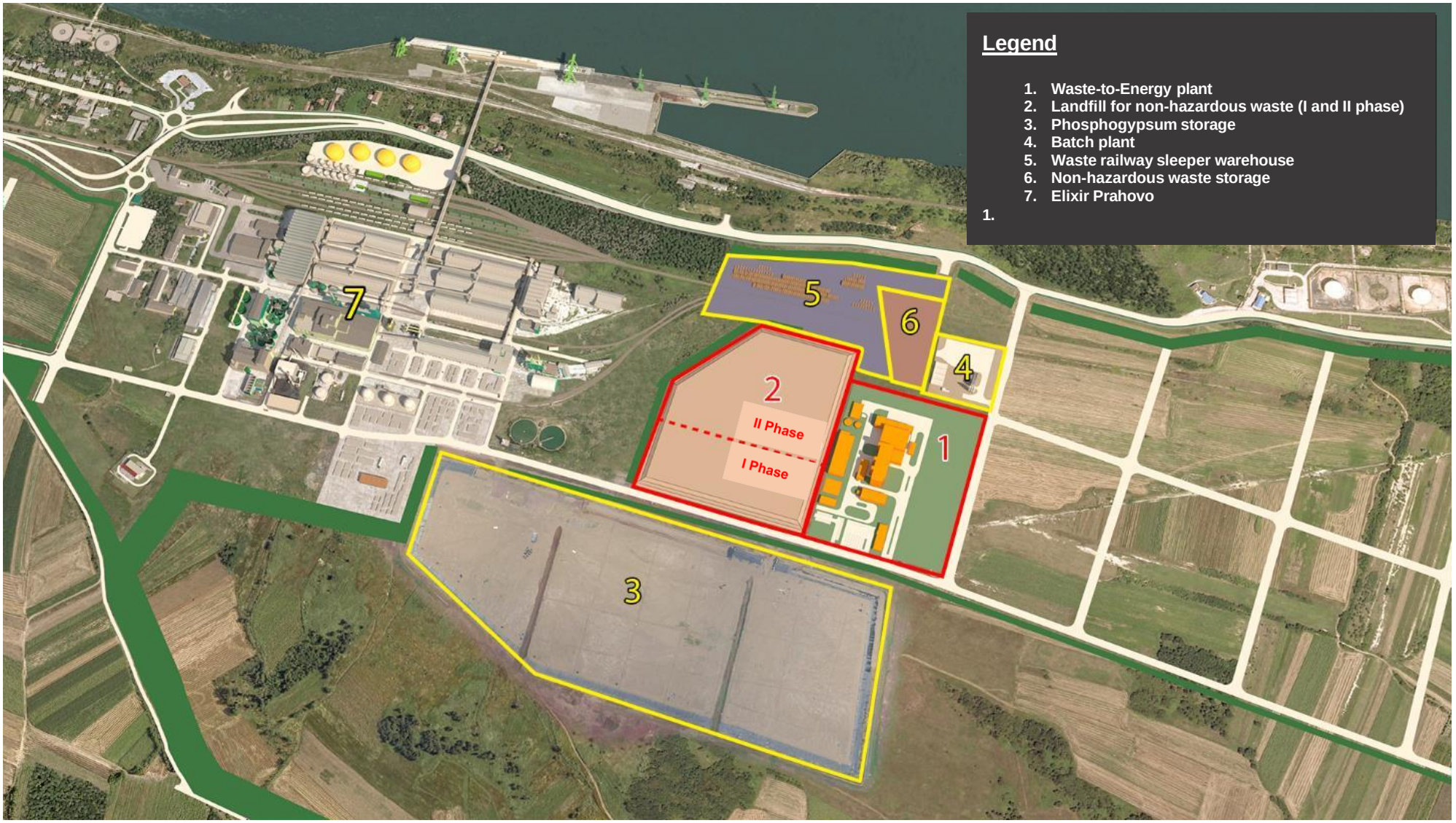


Figure 2.3 Micro-location of the Waste-to-Energy Plant and Landfill for non-hazardous waste

2.3 Overview of terrain characteristics and infrastructure facilities

Earthquakes in the area of the subject location can vary from a very strong earthquake (VII) to a severe earthquake (VIII), so the facilities within the Eco Energy complex are designed accordingly. The company Elixir Prahovo has not recorded a stronger earthquake threat in the past 50 years. The municipality of Negotin has not been affected by a stronger earthquake in the last 50 years.

The settlement of Prahovo and the chemical industry complex in Prahovo are supplied with drinking water, from the source "Barbaroš", which is located at a distance of about 7 km northwest of the complex in the hill of the village of Dušanovac and consists of closed springs and wells.

Negotin is located in a plain surrounded by mountain ranges (Miroč, Crni Vrh and Deli Jovan) and open space on the east and south sides, which all conditions a very specific climate of Negotin characterized by the warmest summers and the harshest winters. The water potential of the Municipality of Negotin consists of the Danube River, which is the largest river in the country, and the second in Europe.

The location of the future Eco Energy complex where the construction of the project in question is planned is located within the industrial zone, where the presence of rare, endangered, protected species of plant and animal origin is not recorded.

Along one border of the complex passes the state road Negotin – Radujevac – Prahovo – Samarinovac, from which the chemical industry complex in Prahovo is accessed, and within which there is a network of internal roads, industrial tracks and transport systems. As local roads and roads in the service of industry are mixed, it is planned to relocate local roads outside the industrial complex and form a greenery zone, which ensures the isolation of the zone of agricultural activities and housing from the influence of the industrial complex and the production process. The industrial railway track and port on the Danube River are located north of the complex site. The proximity of the port and the railway line provide the chemical industry complex in Prahovo, in addition to the road, with the possibility of river and railway transport.

The Eco Energy complex will be fenced by a fence, about 2 m high. The Waste-to-Energy Plant will be supplied with technological and hydrant water from the existing chemical industry complex in Prahovo, and all facilities in the Waste-to-Energy Plant will have their own lightning protection.

3.0. PROJECT DESCRIPTION

A plant for energy recovery of waste is planned at the Eco Energy complex, with a total boiler capacity of 30 MW, designed for the purpose of thermal treatment of hazardous and non-hazardous, liquid and solid waste (industrial, commercial and municipal). The obtained thermal energy will be used to produce 35 t/h of steam, which will be furtherly delivered and used only for the operation of the existing industrial plant Elixir Prahovo. When the consumers of steam produced by the Waste-to-Energy Plant do not work, then the subject Plant will not work either. The total capacity of the Waste-to-Energy Plant is 100,000 t of thermally treated waste for 8,000 h on an annual basis.

In order to round up the process and dispose of residues from the fluidized bed boiler plant (unburned solid residues of slag, ash, sludge/thickened sediment from wastewater treatment) as close as possible to the place of origin, the Landfill for non-hazardous waste will be built on an area of about 8.5 ha next to the Waste-to-Energy Plant. The average annual production of solidificate to be disposed of at the landfill is 8964m^3/year, or a maximum of 25564 m^3/year.

The Waste-to-Energy Plant and the Landfill for non-hazardous waste will be built on the basis of project-technical documentation that is in accordance with the best available techniques.

Operations that the Project Holder plans to implement during the performance of the activity in question are waste-to-energy operations and disposal operations:

1. Operations to which the waste taken over to the plant in question is subjected (storage of waste to be treated, pretreatment of waste: shredding, grinding, mixing and homogenisation, transfer of liquid waste);
2. Thermal treatment of non-recyclable hazardous and non-hazardous waste;
3. Physico-chemical treatment of residues from the boiler plant by stabilization and solidification process (S/S);
4. Disposal of solid residues in the form of a stabilized solidificate at the Landfill for non-hazardous waste.

DESCRIPTION OF THE MAIN CHARACTERISTICS OF THE PRODUCTION PROCESS

The waste plant consists of the following facilities:

1. W-C01 Reception guardhouse and administrative building
2. W-C02 Operations centre
3. W-C03 Fire water tank
4. W-C04 Pumping station and fire station
5. W-C06 Pipeline bridges
6. W-C08 Pretreatment and waste storage
7. W-C09 Waste Pretreatment Filter System and Activated Carbon Filter
8. W-C10 Cargo scales
9. W-C11 Waste thermal treatment plant
10. W-C12 Stabilization and solidification
11. W-C13 Transfer point
12. W-C14 Smokestack
13. W-C15 Ammonia water tank with bundwall
14. W-C16 Solidification filter system
15. W-C17 Fence
16. U-C01 Bus stop
17. U-C02 Maintenance building and auxiliary systems facility
18. U-C03 Wheel washing unit
19. U-C06 Wastewater receiving and treatment system
20. U-C07 Plateau
21. U-C08 Plateau for separated metal
22. U-C09 Natural gas reducing station

23. PLATEAU: Truck parking
24. PLATEAU: Parking for passenger vehicles
25. PLATEAU: Traffic areas
26. PLATEAU: Concrete plateaus
27. OPEN AREAS: Free areas

The management of hazardous and non-hazardous waste within the Waste-to-Energy Plant will be carried out under the strict control of the company through the following activities:

- ✓ Pre-check and acceptance of waste (collection of waste information, verification of the Waste Examination Report received from the waste generator before delivery to the plant in order to determine the types of waste that can be received and treated at the plant)
- ✓ Receipt control and waste examination;
- ✓ Receipt of waste (waste measurement and washing of vehicle wheels);
- ✓ Unloading and temporary storage of solid waste;
- ✓ Unloading, transferring and temporary storage of liquid waste;
- ✓ Unloading and temporary storage of sludge waste
- ✓ Physico-mechanical pretreatment of solid waste (shredding of hazardous and non-hazardous waste, separation, etc.);
- ✓ Transportation-manipulation operations and accompanying technological procedures;
- ✓ Waste thermal treatment and production of thermal energy in the form of steam.

Pre-check and acceptance of waste

Liquid and solid non-hazardous and hazardous waste will be taken over by the Project Holder from the waste generator or authorized operators who have the permission of the relevant authority for the collection, transport and/or storage of waste. During the contracting process, all generators and operators will be provided with clear instructions and guidelines on the types of waste, the way the waste should be packaged and labelled, and the required accompanying documentation, so that the waste can be received and treated at the relevant Waste-to-Energy Plant. Having in mind the above, previously sorted and adequately packaged waste that meets all the requirements for acceptance to the plant will be delivered to the complex in question.

Project holder, as the future operator of the plant, intends to conduct a detailed pre-acceptance inspection of each new generator and type of waste as part of the pre-acceptance procedure. This includes visiting the generator's facility, reviewing the technological process in which the waste was generated, the method of handling the waste at its origin, analyzing complete waste documentation, and safety data sheets (MSDS) of all chemicals involved in the technological process that generated the waste. A crucial component of the pre-acceptance inspection involves representative sampling and additional detailed testing of the waste composition. These will be conducted by contracting accredited laboratories for sampling and laboratory testing of the physicochemical parameters of the waste, as specified by the relevant Regulations and Decrees, and additional parameters if required.

If the waste cannot be inspected and its origin reviewed at the generator's facility for any reason, or if it pertains to heterogeneous waste or small quantities of waste from one or more generators, the pre-acceptance procedure, i.e., detailed pre-acceptance inspection, will be carried out at the storage facility for hazardous and non-hazardous waste at the operator's site. This arrangement will be formalized through a business-technical collaboration agreement, which will define the implementation of the pre-acceptance procedure and mutual obligations. Based on this agreement, sampling and pre-acceptance inspection will be performed at the operator's storage facility by the contracted accredited laboratory using detailed sampling and laboratory testing of physicochemical parameters as specified in the relevant Regulations and Decrees, along with additional parameters if required. Only after conducting a thorough pre-acceptance protocol will a decision be made regarding the acceptance or rejection of the waste for thermal treatment at the plant.

Acceptance control and waste examination

Following the thorough pre-acceptance inspection, a positive decision on waste acceptance, and contract agreement for its delivery, an acceptance procedure will be conducted for each agreed waste

delivery before its receipt (unloading) at the plant. This involves an acceptance inspection of waste, including a review of the complete documentation from the pre-acceptance inspection, visual inspection of the waste, sampling at the time of acceptance, and testing in the plant's internal laboratory using rapid methods. These rapid methods can provide results within approximately 60 minutes (adjusted to exclude ash content and focus on dry matter). The acceptance inspection is conducted to verify compliance and provide additional confirmation that the specified waste corresponds to the agreed delivery and quality determined by the accredited pre-acceptance inspection report, in accordance with the established operational protocol.

The delivery of waste to the Waste-to-Energy Plant will be carried out by the operator itself or other operators, with their means of transport in accordance with legal regulations. Access to the Eco Energy complex will be done through internal roads that have been formed within the existing industrial chemical complex Elixir Prahovo. Vehicles with waste materials will enter through the gate of the Elixir Prahovo complex where the ramp and the guardhouse are located. After identification, the vehicle moves along the internal road and enters through the gate from the southeast side of the Waste-to-Energy Plant. At the very entrance of the Waste-to-Energy Plant, the facility W-C01 Reception guardhouse and administrative building are planned, where the reception control and examination of the delivered waste will be carried out.

Following the thorough pre-acceptance inspection, a positive decision on waste acceptance, and agreement on its delivery, an acceptance procedure will be implemented for each agreed waste delivery prior to its receipt at the plant (unloading). This involves conducting an acceptance inspection of the waste, which includes reviewing the complete documentation from the pre-acceptance inspection, performing a visual inspection of the waste, acceptance sampling, and testing in the plant's internal laboratory using rapid methods. The acceptance inspection aims to verify compliance and provide additional confirmation that the specified waste corresponds to the agreed delivery and quality determined by the accredited pre-acceptance inspection report, in accordance with the operational protocol.

The project documentation defines that waste containing more than 1% of halogen organic substances expressed as chlorine cannot be treated on the boiler. It is strictly forbidden to accept waste that is explosive, flammable, infectious, radioactive, waste materials containing or contaminated with polychlorinated biphenyls (PCBs) and/or polybrominated triphenyls (PCTs) and/or polybrominated biphenyls (PBB), waste containing cyanides, isocyanates, thiocyanates, asbestos, peroxides, biocides, cytostatics. Additional restrictions on reception to the plant in question are waste substances in the form of aerosols, as well as organometallic compounds (spent metal-based catalysts, or organometallic wood preservatives) and aluminized paints.

Representative samples will be taken exclusively by trained and equipped employed operators. For the purpose of performing analyses of waste samples taken and checking compliance with the data from the accompanying documentation accompanying each shipment, within the facility *W-C01 Reception guardhouse and administrative building*, one smaller laboratory on the ground floor of the facility is envisaged to perform rapid analyses during the reception control of waste, with an area of 24.51 m^2 and

one internal central laboratory, with an area of 116 m^2, on the floor of the facility, where the necessary detailed analyses of waste will be performed to determine the recipe of waste thermal treatment. In addition to the central laboratory on the first floor of the facility, a warehouse for storing laboratory samples, the documentation archive room and the laboratory office are also planned.

Note: During the performance of rapid analyses (about 60 min.), until the results of examination and confirmation of compliance with the data from the accompanying documentation are obtained, the transport vehicle with waste material will be temporarily parked in the planned area, Truck Parking, which is located directly next to the facility W-C01 Reception guardhouse and administrative building, and outside the fence of the Waste-to-Energy Plant itself. During the rapid analyses, the following parameters will be examined: heavy metal content, determination of the calorific value of waste, ash content, moisture, illicit substances.

Receipt of waste (waste measurement and washing of vehicle wheels)
If all the conditions for the receipt of waste are met, at the entrance to the Waste-to-Energy Plant complex on the cargo scale (W-C10), the mass of the vehicle for the transport of waste and the measurement of waste received at the plant will be measured.

After the measurement, the vehicle is referred to the truck wheel washer (*U-C03 Wheel Washing Unit*). As the vehicle approaches the wheel washing unit, the wash cycle is automatically activated via the sensor contact. The water from the truck wheels washing is drained into the collecting pit and then pumps into the tank where the deposition of solids is carried out. The purified water is then reused by the pump to wash the wheels and therefore no outflow of water into the recipient is foreseen. The precipitate is collected by cleaning the tank and temporarily stored in facility W-C08 until thermal treatment.

Storage capacities for receipt and storage of solid, sludge and liquid waste
An overview of the capacity of the solid waste reception and storage area/bunker is shown in Table 3.1, sludge waste in Table 3.2 and liquid waste in Table 3.3.

Reception and storage of solid waste >100mm, before mechanical pretreatment (pretreatment hall)	Technical warehouse markings:	KKS marking	Area, m^2	Volume, m^3	Max filling capacity of the warehouse volume, %	Average bulk density of waste t/m^3
	P1	00 EAB 00 BB 001	80	160	<75	0.70

Reception and storage of mechanically pretreated solid waste (storage bunkers for pretreated waste)	Technical warehouse markings:	KKS marking	Solid waste storage volume		Max filling capacity of solid waste storage	
			% volume	m^3	% volume	m^3
	S1 (reception)	00 EAB 01 BB 002	100	268	75	201
	S2 (reception)	00 EAB 10 BB 003	100	227	75	170
	S3 (reception)	00 EAB 01 BB 004	100	229	75	172

Under maximum operating conditions, the boiler plant can process 17 t/h of waste, which is the most relevant indicator of the maximum hourly load. Consequently, the maximum waste intake at the plant can be 3 trucks per hour, under conditions of minimal possible bulk density of waste and/or ADR restrictions during transport by trucks.

Storage of mechanically pretreated solid waste (storage bunkers for pretreated waste)	Technical warehouse markings:	KKS marking	Solid waste storage volume		Max filling capacity of solid waste storage	
			% volume	m^3	% volume	m^3
	S4 (storage)	00 EAE 00 BB 001	100	1,871	75	1,403
	S5 (storage)	00 EAE 00 BB 002	100	1,857	75	1,393
	S6 (storage)	00 EAE 00 BB 003	100	1,028	75	771

Storage for preparing a mixture of pretreated solid waste for thermal treatment (storage bunker for mixing and homogenization of solid fuel)	Technical warehouse markings:	KKS marking	Solid waste storage volume		Max filling capacity of solid waste storage	
			% volume	m^3	% volume	m^3
	S7_ MIX	00 EAE 00 BB 004	100	1,970	75	1,478

In the storage bunker S7_MIX, solid waste is mixed and homogenized using a crane. Homogenized waste material is transferred by cranes into the prepared fuel bunker, designated S8_SGG (00 EAE 00 BB 005), from where the prepared waste material is then dosed into the boiler plant.

Storage of finished mixtures of pretreated solid waste for thermal treatment (storage bunkers for finished solid fuel)	Technical warehouse markings:	KKS marking	Solid waste storage volume		Max filling capacity of solid waste storage	
			% volume	m^3	% volume	m^3
	S8_SGG	00 EAE 00 BB 005	100	1,181	75	886

Reception and storage of sludge waste (storage bunker)	Technical warehouse markings:	KKS marking	Sludge waste storage volume		Max filling capacity of sludge waste storage	
			% volume	m^3	% volume	m^3
	SOM	00 EAB 10 BB 001	100	116	75	87

	Technical tank	KKS marking	Storage tanks	Volume, m^3

	markings			
Liquid waste storage (storage tanks)			**Liquid waste storage 1**	
	R17-1	21EGB20BB001	Storage tank for non-combustible liquid waste	17
	R17-2	21EGB21BB001	Storage tank for non-combustible liquid waste	17
	R17-3	21EGB22BB001	Storage tank for non-combustible liquid waste	17
	R17-4	21EGB23BB001	Storage tank for non-combustible liquid waste	17
	R17-5	21EGB24BB001	Storage tank for combustible liquid waste	17
	R17-6	21EGB25BB001	Storage tank for combustible liquid waste	17
			Liquid waste storage 2	
	R30-1	21EGB26BB001	Storage tank for bilge and oily water	30
	R30-2	21EGB27BB001	Storage tank for bilge and oily water	30
Storage of packaged heterogeneous waste (liquid, sludge, and solid waste) (shelf storage for IBC containers, drums, etc.)			**Liquid waste storage 3**	**Number of pallet places**
	SKL_ GT		Storage for combustible liquids (IBC/drums)	20
	SKL_NGT SKL_NGČ		Storage for non-combustible waste (IBC/drums, etc.)	159
	QZ		Quarantine zone	30

Within the subject plant, in the facility, W-C08 Pretreatment and storage of waste, two lines for physical and mechanical pretreatment of waste are foreseen:

- Pretreatment line for bulk solid non-hazardous and hazardous waste (railway sleepers, etc.)
- Pretreatment line for hazardous waste (delivered in IBC containers, barrels, etc.)

Pretreatment line for bulk solid non-hazardous and hazardous waste - The delivered waste material with dimensions greater than 100 mm will be taken from the temporary storage using a grabber and transferred to the feed hopper of the first shredder with a capacity of 20-40 t/h (depending on the type of waste being treated).. The shredded waste is then sent via a belt conveyor to the magnetic separator where the metal is separated from the waste. The separated metal fraction is shipped to temporary storage containers. When the container is filled with separated metal waste, it is transported to the concrete plateau for the separated metal, where it is temporarily stored before further dispatch, i.e. handed over to authorized operators for further disposal. After removing the metal from the waste, the shredded waste is sent via a belt conveyor to second shredder for fine shredding. The main function of the fine shredder is to additionally shred the waste to a granulation <100 mm, which is the appropriate size of waste ready for thermal treatment in a fluidized bed boiler plant. Finely shredded waste is fed through a conveyor into the reception bunker, from where it is later mixed and dosed to the boiler according to the defined recipe.

In order to reduce the emission of particulate matter and unpleasant odours from the premises for unloading and pretreatment of hazardous and non-hazardous waste, in the event that the boiler plant does not work (due to overhaul, downtime, etc.), it is envisaged a dedusting and ventilation system consisting of exhaust hoods, pipelines, filter unit with accompanying equipment, activated carbon filters, fans, with a capacity of 24,000 m^3/h and emitter (smokestack) through which purified air is discharged

into the atmosphere.

Hazardous waste pretreatment line - Previously received and stored IBC containers/barrels with solid and liquid waste, as well as empty packaging waste, will be transported by forklift from the IBC container/barrel Storage room to the room where the hazardous waste pretreatment equipment is located. The rooms are separated from each other by two FP sliding doors that automatically close in the event of a fire alarm.

The forklift lowers the delivered IBC container/barrel/jumbo bag onto a roller conveyor by which the vessel is transported to the elevator by which it is then lifted vertically to the chamber. The primarily shredded material is introduced into a mixer, after which it is transported via a double screw conveyor to a piston pump. The piston pump is used to transport the primarily shredded hazardous waste to a disintegrator, where additional homogenization and shredding of the waste to the required granulation (<100 mm) takes place. After the disintegrator, the hazardous waste is transported by a screw conveyor to the dosing conveyor for solid waste on the left side of the boiler, from where the waste is sent for thermal treatment in the boiler.
The waste shredding process takes place under atmospheric pressure and temperature conditions. The treated waste is also under atmospheric pressure and temperature conditions. Given this, there are no conditions during the shredding of flammable liquids in IBC containers on the relevant shredder that could lead to the formation of explosive atmospheres.

Waste thermal treatment and production of thermal energy in the form of steam

One boiler plant line is planned for the thermal treatment of waste, with a capacity of up to 100,000 t/year (the mass flow of waste depends on its calorific value and ranges from 3.43 to 17.24 t/h), located within the W-C11 facility. The thermal treatment line includes an incineration chamber (burning) in a fluidized bed, followed by boiler heating surfaces across three smoke gas passages, which then pass through the evaporator and economizer. The flue gases then enter the part of the gas treatment plant. Flue gas cleaning is performed by dusting, absorption, adsorption and catalytic reactions. Dry cleaning of the emitted gases is carried out by dusting on filter bags and adsorption on activated carbon. Wet cleaning is performed in two-stage scrubbers. The water from the scrubber is cleaned in the water treatment plant. Selective catalytic reduction (SCR) units are provided for the reduction of nitrogen oxides, which is also the last step in the flue gas treatment process. Cleaned gases are emitted through the smokestack into the atmosphere.

The subject boiler Waste-to-Energy Plant includes the following functional units:

- system for dosing prepared waste for thermal treatment,
- combustion air and recirculation gas system,
- boiler,
- sand storage and dosing system,
- ignition and auxiliary fuel system,
- slag and ash transport system,
- feed water system,
- venting/drainage system and
- other auxiliary systems.

In addition to the aforementioned activities, the following are also envisaged for the purpose of the operation of the plant in question:

- ✓ Preparation of process water for the needs of the operation of the plant;
- ✓ Distribution of auxiliary fluids (CNG, nitrogen, compressed air, ammonia water);
- ✓ Treatment of gases (from the process of pretreatment, storage, waste thermal treatment, stabilization and solidification) emitted at the plant in question;
- ✓ Treatment of residues from thermal waste treatment plants – Stabilization and solidification;
- ✓ Dispatch of solidificates to the Landfill for non-hazardous waste and handover of secondary raw materials (metal, plastic, etc.) to authorized operators for further disposal;
- ✓ Wastewater collection and treatment.

Preparation of process water for the needs of the operation of the plant

The complex will be supplied with process water by connecting it to the existing system of the Elixir Prahovo complex for the delivery of Danube water, after which the primary treatment will be performed on the sand filter system. The water is then fed to the receiving pools in the U-C02 facility, and then distributed to the final consumers of the Waste-to-Energy Plant. The maximum required amount of process water is Q= 122 m^3/h of which 50 m^3/his used to prepare process water for the needs of consumers at the complex, and 72 m^3/h is used to refill the tank for fire protection purposes.

Distribution of auxiliary fluids (CNG, nitrogen, compressed air, ammonia water)

Natural gas (CNG) is brought to the Waste-to-Energy Plant from the existing Elixir Prahovo complex. Natural gas is used to operate the boiler burner as an ignition and auxiliary fuel.

Nitrogen is generated from compressed air in the U-C02 auxiliary systems facility and distributed to consumers from there: waste thermal treatment plant, liquid waste transfer station, pretreatment and waste storage.

Compressed air purified of mechanical impurities, oil content is supplied from the existing Elixir Prahovo complex to the compressed air tanks in the U-C02 facility of auxiliary systems. Compressed air is distributed from the tank to the end consumers.

Ammonia water (25% solution) is delivered to the site by tank trucks from which it is pumped into the ammonia water storage tank. It is used to reduce nitrogen oxides in the Selective Catalytic Reduction (SCR) reactor.

Treatment of gases emitted at the plant in question

The largest and most complex part of the Waste-to-Energy Plant are the cleaning systems of flue gas generated during the incineration of waste. These systems are designed on the basis of the defined chemical composition of the recipes of different types of waste entering the incineration process and include:

- Dry flue gas cleaning (cyclone and activated carbon reactor and bag filters);
- Wet flue gas cleaning in scrubbers;
- Selective catalytic filter (SCR system for selective catalytic reduction of nitrogen oxides (NO_x)).

Dry flue gas cleaning - The flue gases generated in the boiler are first purified in cyclone separators where larger particles of fly ash are separated. Cyclone separators are located between the 3rd and 4th passage of the boiler. The flue gases from the 4th passage of the boiler reach the reactor with activated carbon in which dioxins, mercury and heavy metals are separated, and then enter the bag filters in which the particulate matter are removed.

Wet flue gas cleaning - After dry flue gas cleaning in bag filters, flue gases enter the wet flue gas cleaning system covered by the two-stage scrubber system - I: HCl scrubber system and II: SO_2 scrubber system. In the first scrubber, cooling of flue gases to saturation temperature in contact with water and absorption of halogen and SO_3 compounds takes place. In the second scrubber, sulfur oxide is removed from the flue gases using lime milk.

Selective catalytic filter - In the process of incineration of waste material - fuel in the boiler, nitrogen oxides (NO_x) are formed. Nitrogen oxides that have the greatest impact on environmental pollution are nitrogen – monoxide (NO) and nitrogen – dioxide (NO_2), while other oxides occur in relatively low concentrations, and their impact is negligible. Final flue gas cleaning (reduction of nitrogen gas (NO_x) emissions) takes place in a SCR reactor with a packed catalyst layer. The reduction of NO_x emissions is achieved by injecting 25% aqueous ammonia solution (ammonia water) into the boiler flue gases immediately before entering the SCR reactor. In the SCR reactor, selective catalytic reduction of NO_x occurs. Cleaned flue gases after the SCR system are discharged into the atmosphere via a smokestack.

Treatment of residues from thermal waste treatment plants – Stabilization and solidification

Regular operation of the subject fluidized bed boiler plant may result in the following solid (unburned) residues:

- Bottom ash (large fraction of unburnt material that is separated at the bottom of the boiler under the furnace);
- Boiler ash (separated between the second and third passages of flue gases through the boiler);
- Cyclone ash (fraction of fly ash from the boiler that is separated from the emitted gases when passing through two cyclone separators);
- Ash from the economizer (fine fraction of fly ash separated during the pass of flue gases through the economizer);
- Filter ash (fine fraction of fly ash separated during the pass of flue gases through the bag filter system; so-called fly ash);
- Activated carbon with a fraction of fine particles from the flue gas;
- Sludge/thickened sediment from the treatment of wastewater from the wet flue gas cleaning system (which is separated in the form of thickened sediment by centrifugation).

All these flows are collected in a controlled manner by a system of boiler conveyors that take solid residues to the stabilization and solidification plant (W-C12). Homogenized residues from the boiler plant are introduced from the conveyor, through the filling funnel, from the boiler plant into the stabilization and solidification facility. The maximum amount of residues introduced into the facility is 3.1 t/h. The stabilization and solidification facility is divided into fields (boxes) for aging the remains. Thus, in addition

to the fact that the boxes within the W-C12 facility play the role of a storage, a process of stabilization of solid residues takes place in them, which lasts 7-14 days. This is the period for which residues are stabilized. During the stabilization period, reactions occur in which hydrogen is separated, chromium reduction reactions (Cr(VI)), etc. Nozzles are also provided in the facility to spray aging residues (reducing the emission of particle matter and promoting stabilization).

After ageing, stabilized residues are sent for solidification. Solidification is a technological process which reduces the potential danger of waste material by physically binding or encapsulating contaminants (such as heavy metals etc.) into a stabilised mass and converting them into solid, stable forms.

The projected capacity of the solidification plant is 60 m^3/h of solidificates, i.e. 30 cycles per hour. One cycle includes filling the mixer, mixing and emptying the mixer. Mixing time in the mixer is 32s. After this time, the resulting solidificate is discharged from the underside of the mixer, directly into the dump truck by which it is transported as a batch to the Landfill for non-hazardous waste in question. Taking into account the annual working hours of 8300 h/year, the average annual production of the storage solidificate is 8964 m^3/year, i.e. a maximum of 25564 m^3/year.

Dispatch of solidificates to the Landfill for non-hazardous waste and handover of secondary raw materials to authorized operators for further disposal

Concrete plateaus are envisaged for temporary storage of separated secondary raw materials until they are handed over to authorized operators for recycling. The temporary storage of secondary raw materials will be provided with a waterproof substrate from which all atmospheric water is collected and taken to the grease and oil separator.

The solidificate obtained, in the manner described above, within the Waste-to-Energy Plant, will be transported by dump trucks and disposed of on the landfill body with the recorded disposal location. The tipped material will be spread to achieve layers of uniform thickness of about 30 cm. After spreading, the deposited material will be compacted by crossing the roller multiple times to obtain a layer up to 20 cm thick. The planned total height of the landfill is 46 m.

Wastewater collection and treatment

A separate sewerage system is planned within the Waste-to-Energy Plant for the purpose of wastewater collection. The wastewater to be generated at the plant in question is as follows:

- Atmospheric conditionally clean water from the roof of the facility;
- Atmospheric potentially oily wastewater (treatment on grease and oil separator);
- Sanitary foul wastewater (biological treatment);
- Process wastewater (treatment at the wastewater treatment plant of the boiler plant, sand filter and activated carbon filter);
- Wastewater from extinguishing possible fires (there is no discharge of these waters since they are collected and subsequently thermally treated in the boiler plant).

Atmospheric clean water from the roof of the facility - Clean rain sewerage collects atmospheric water fallen on the roofs of the facilities and carries them to the border of the complex closest to the drainage collector of all clean and treated water that can be discharged into the recipient of the Danube River. The precipitation load is calculated as 300 litres/sec/ha.

Atmospheric potentially oily wastewater - Oily rainwater sewerage from the Waste-to-Energy Plant collects atmospheric water from roads, plateaus and parking lots and takes them to the border of the complex. Two "by pass" separators of petroleum products are envisaged here. The efficiency of separating light petroleum products - light liquids in the separator outlet water is up to 5mg/l.
Thus, the purified oily sewage is connected to the conditionally clean rainwater sewerage to the drainage Central collector for the entire Elixir Prahovo complex, and through it it is discharged into the Danube. A sufficient number of inspection descents necessary for the normal maintenance of the network are planned on the network.

Sanitary foul wastewater - The foul sewerage collects all sanitary-foul wastewater from the facilities' sanitary facilities and conducts it to the treatment plant (mechanical and biological treatment). The treated wastewater is connected to the shaft of conditionally clean rain sewerage and then discharged into the internal network of the Elixir Prahovo complex and into the Danube. A sufficient number of inspection descents necessary for the normal maintenance of the network are planned on the network.

Technological wastewater - Technological wastewater will be collected and directed through separate lines (T1-T4) to the designated chambers of the U-C06 wastewater pool within the Waste-to-Energy Plant:

- Line T1 - Technological wastewater from the wastewater treatment plant of the boiler facility (wastewater generated during flue gas treatment);
- Line T2 - General technological wastewater from the thermal waste treatment plant W-C11 (water from service drains, boiler desludging water, wastewater from fire extinguishing in the W-C11 facility);
- Line T3 - Wastewater from washing sand filters during process water preparation;
- Line T4 - Wastewater from washing filters in the wastewater treatment plant (WWTP);
- Line T5 - Filtered wastewater that goes to the WWTP for treatment.

Note: The project also envisages pumping leachate from the body of the Landfill for non-hazardous waste (solidificate) into the wastewater pool U-C06 within the Waste-to-Energy Plant. The excess leachate water generated within the Non-Hazardous Waste Landfill will, when conditions allow, be pumped through the grease and oil separator into Chamber 3 of the wastewater pool U-C06 (maximum 2-3 m^3/h). From Chamber 3 of the pool, the leachate water from the landfill will first be sent to the Wastewater Treatment Plant (WWTP), and after filtration, it will be forwarded to the Boiler Facility Wastewater Treatment Plant (ECWWT).

4.0. OVERVIEW OF THE MAIN ALTERNATIVES CONSIDERED BY THE PROJECT HOLDER

Prior to making a decision on the location where the project for the construction of an energy recovery plant and the Landfill for non-hazardous waste will be implemented, the Project Holder considered the proximity of populated places. There are no inhabited places in the immediate vicinity of the site in question, the Eco Energy complex itself is directly surrounded by industrial facilities and devastated undeveloped land planned for the expansion of the industrial zone.

The suitability of the selected location is also reflected in the existence of a complete infrastructure network (transformer station, telecommunications network, compressed natural gas installations, water supply and sewerage network, roads, etc.) within the industrial zone, and therefore it can be used to connect the planned Eco Energy complex to it.

An additional advantage of the selected location for the construction of the Waste-to-Energy Plant is also reflected in the vicinity of the production facilities of the Elixir Prahovo complex, since the thermal energy obtained from the waste thermal treatment, as stated earlier, will be used for the production of steam that will be delivered and used for the evaporation of phosphoric acid within Elixir Prahovo.

Also, when choosing a location for the implementation of the project in question, demographic trends were considered, which are reflected in the appearance of an above-average negative natural increase, a high rate of emigration and the average age of the population. The municipality of Negotin has extremely unfavourable demographic trends in relation to the rest of the Republic. With a population of around 28,000 inhabitants (according to the 2022 census), it is in the group of the most sparsely populated areas of Serbia. The expansion of the chemical industry complex will provide new jobs that will enable young people to stay in Negotin.

When selecting the location, the presence of archaeological sites was also considered. Based on the defined boundaries of the aforementioned Detailed Regulation Plan for the subject area, and therefore the boundaries of the scope of the subject projects, it was determined that there are no recorded natural and ambient units, as well as recorded archaeological sites. The presence of rare, endangered, protected species of flora and fauna has not been registered at the location of the future Eco Energy complex. It is not located within the protected area for which the protection procedure has been implemented or initiated, as well as within the spatial scope of the ecological network of the Republic of Serbia.

The selection of a closed facility (hall) for the storage of solid and liquid waste and mechanical preparation of solid waste materials was carried out by the Project Holder in order to prevent the emission of unpleasant odours and dust into the surrounding area. Concrete waterproof bunkers for solid waste storage are planned in the hall. Removal of dust and unpleasant odours and prevention of their emission outside the facility is achieved by keeping the hall constantly under pressure, drawing air from the hall and burning it in the boiler plant. In cases where the boiler plant does not work (due to overhaul, downtime, etc.), the air from the waste storage facility will be directed to the bag filter system and activated carbon filter by means of a fan, where it is purified, and then the purified air is discharged into the atmosphere via the emitter (smokestack) of the filter unit.

When choosing the technology for the construction of the Landfill for non-hazardous waste, the conditions prescribed by the Regulation on disposal of waste on landfills ("Official Gazette of RS", No. 92/2010). The installation of a geomembrane made of high-density polyethylene (HDPE), 1.5 mm thick, which meets the requirements of the relevant European standards, is envisaged as a substrate on the landfill

body. A drainage and relief layer of gravel with a minimum thickness of 50 cm will be placed on the geomembrane. The drainage pipes will be covered with a layer of gravel with a minimum thickness of 50 cm, which will be wrapped with a layer of geotextile.

The selection of equipment was carried out by ensuring that the equipment for performing related activity is from the latest generations used both locally and globally, that it is provided with appropriate certifications and that it meets the requirements of the recommended BAT techniques, which aim to reduce the negative impact on the environment.
With regular maintenance, the expected lifespan of the Waste-to-Energy is about 50 years. The expected exploitation time of the landfill is 126 years, while at the maximum load, the calculated exploitation time is about 44 years. By advancing the landfill in height, reclamation of the external slope will be carried out and the landfill closing down.

In order to improve the overall performance from the point of environmental protection, it is envisaged to establish and implement an Environmental Management System (EMS). The preparation of the Plant Management and Operation Manual (Management Handbook) is in progress, which will define all activities, precise environmental protection policy, waste management quality guarantee policy, organization, work protocols, working conditions, conditions and method of treatment of residues from the thermal treatment process, reporting, EMS, work procedures in emergency situations, etc.

All members of the Elixir Business System conduct regular training of employees and constantly work on personnel training in order to fully meet the needs of the work of the complex. Employees are trained for:

- working on the plant,
- maintenance,
- occupational safety with fire protection measures,
- environmental protection,
- protection against chemical accidents.

The training is conducted according to a special procedure, approved plans and programs in accordance with a predefined schedule.

In the event of a decision on the termination of the operation of the plant in question, the equipment will be dismantled and, if necessary, the land will be remediated in accordance with legal regulations and the land will be able to be used for some other purpose. When performing works on the development of the site in the event of termination of the Project, it is mandatory to organize the collection of municipal waste, construction waste, waste with the characteristics of secondary raw materials, waste with the properties of hazardous substances, with mandatory treatment and evacuation in accordance with the regulations of the Republic of Serbia.

5.0. PRESENTATION OF THE STATE OF THE ENVIRONMENT AT THE LOCATION AND THE SURROUNDING AREA (MICRO AND MACRO LOCATION)

The state of the environment of the site covered by this Study can be assessed on the basis of the performed measurements of environmental factors, as well as on the basis of the calculation of the concentration of pollutants in the environment, by various mathematical models.

The description of environmental factors that may be exposed to risk due to the execution of the project in question includes in particular:

1. population;
2. flora and fauna;
3. soil, water, air and noise;
4. climate factors;
5. buildings, immovable cultural goods, archaeological sites and ambient units;
6. landscape;
7. the interrelationship of listed factors.

Population

In the municipality of Negotin, according to the 2022 census, there were 28,261 inhabitants in 12,386 households, while according to the 2011 census, there were 37,056 inhabitants in 13,906 households. According to the 2022 census, there were 14,647 inhabitants in 6,147 households in the city of Negotin, 799 inhabitants in 332 households in Prahovo, and 735 inhabitants in 308 households in Radujevac.

Of the total population in the municipality of Negotin,according to the 2022 census, there were 13,689 men and 14,572 women, of which 393 were men and 406 women in the settlement of Prahovo. The average age of the population of the municipality of Negotin was 50.36; men 48.83 and women 51.80 years. The average age in Prahovo is 50.68 years, and the Radujevac settlement is 56.33 and both settlements have a predominantly adult population.

Flora and fauna

In order to determine the current state of flora and fauna at the site in question and its wider environment, a *Biodiversity Study of the industrial complex "Elixir Prahovo" – Chemical Products Industry LTD. Prahovo* was conducted by the Institute for Biological Research "Siniša Stanković". An exploration of the area of 20 km^2, downstream of HPP Djerdap 2, including the area of the Eco Energy complex in subject, was carried out considering the impact of the construction and operation of the plant on the biodiversity of the nearby areas of the neighbouring countries of Romania and Bulgaria.

The study of biodiversity concluded that the eradication of the Mesian forest of grey pedunculate and the drainage of the floodplain of ponds and wetlands in the 1930s by the construction of HPP Djerdap 2 permanently destroyed natural potential vegetation, and with it the accompanying fauna. The area is dominated by anthropogenic communities of arable land (pastures, fields, orchards, vineyards). Current vegetation, flora and fauna are of secondary origin and are of no interest for protection. The negative effects on the fish fauna are mainly due to the impact of the HPP Djerdap 1 and 2 dams, which prevent migration upstream and downstream, affect the flow regime and cause large oscillations in the water level, above, between and in the part of the flow below the dams. Migratory fish species such as sterlet and barbel, which favour the faster flow, have migrated to the upstream part of the Danube, while species such as bream showed intensive growth in the newly formed reservoirs.

At the location intended for the construction of the Eco Energy complex, nor in its immediate vicinity, there are no registered rare or endangered plant and animal species, which is confirmed by the decision of the Institute for Nature Conservation of Serbia, which states that the location in question is not within the protected area for which the protection procedure has been carried out or initiated, as well as within the spatial scope of the ecological network of the Republic of Serbia.

Approximately 40 kilometers northwest of the Eco Energy complex lies the "Djerdap" National Park, established in 1974 under the Law on the Djerdap National Park ("Official Gazette of SRS", No. 31/1974). The "Djerdap" National Park spans parts of three municipalities: Golubac, Majdanpek, and Kladovo, covering an area of 63,608.45 hectares.

Soil, water, air and noise

Soil and groundwater

Bearing in mind that the construction of the Eco Energy complex is planned in the immediate vicinity of the existing Elixir Prahovo complex, the results of regular soil quality monitoring performed by Elixir Prahovo were used for the purpose of presenting the zero state of the site in question. The report "Analysis of the state of environmental factors" was also prepared by the company for copyright protection and engineering, Autorski biro Beograd, where it was noted:

- It was noted that the pH values of the samples (water and soil), located near the former pyrite cinder landfill, are more acidic, compared to the pH values in the samples closer to the current phosphogypsum storage facility;
- Groundwater levels change and directly depend on the height of the Danube, with a slight increase in levels;
- The content of organic matter is the highest in the surface layer of soil;
- Slightly higher concentrations of pollutants are registered in the surface layer and in the higher layers of soil, up to the groundwater level;
- The marly-clay complex occurs at depths of over 15 m and has a significant thickness estimated at over 12 m. This complex is a hydrogeological insulator.
- Studies have shown that higher concentrations of Ni occur regularly in samples, but in concentrations lower than remediation values (RV). This occurrence of Ni, regardless of the location and depth of the samples taken, indicates the geological origin of this metal, which coincides with the results of soil examinations at several other locations in Serbia.
- The increased concentrations of Co are probably the result of surface contamination occurring in the period when a phosphate with a higher cobalt content was used in the phosphoric acid production plant, prior to privatisation. Concentrations of Co are not over RV in any place.
- In the surface layer of the soil, higher concentrations of pollutants were found in relation to the deeper layers, especially those of organic origin (hydrocarbons and pesticides above the limit values of LV, and below the remediation values (RV)) in several samples taken in the Energy and Ecological Island Zone.
- In only one sample, taken next to the phosphogypsum storage facility, the values of As and Cu >RV (Zone II) were determined. Increased concentrations of As and Cu are likely to have occurred as a result of the deposition of pyrite cinders over a longer period. The finding of As in one sample next to the phosphogypsum storage requires additional examinations, before raising the soil layer for expanding the storage, or after moving it at the stage of preparatory works for construction.
- Slightly higher concentrations of pesticides in Zone IV are probably the result of historical pollution caused by poor waste management from the time of pesticide production, which has not been performed on the site for more than 15 years. The long half-life of these pollutants, increased

concentrations of organic matter in the surface layer of the soil and probably weaker leaching of soil by atmospheric precipitations, influenced the longer retention of pesticides in the soil. Due to the observed increased concentrations of pesticides and hydrocarbons, no special interventions are required, except for soil and groundwater monitoring, especially during preparatory works for the construction of facilities.

In order to examine the state of groundwater during engineering-geological mapping of the area envisaged for the construction of the Eco Energy complex, 3 exploration wells (PBs-4, PBi-14 and PBi-15) were constructed in which piezometric structures were installed. Piezometers have the role of continuous monitoring of groundwater levels (UWL), as well as for the purpose of sampling and analysing groundwater chemism in order to detect changes from the initial "zero state" before the start of the project.

The results of groundwater testing from piezometers PBs-4, PBi-14 and PBi-15 show that all values of the examined parameters are in accordance with the average annual concentrations, prescribed by the Regulation on Emission Limit Values for Pollutants in Surface and Groundwaters and Sediments and Deadlines for Their Reaching ("Official Gazette of RS", No. 50/2012, Appendix 2, Table 1) and remediation values prescribed by the Regulation on Limit Values for Pollutants, Harmful and Hazardous Substances in Soil ("Official Gazette of RS" No. 30/2018 and 64/2019, Appendix 2).

Surface and wastewater

Surface water quality can be expressed by classifying a given watercourse into one of the water quality classes. We distinguish four classes of surface water and out-of-class condition:

- Class I, waters that in the natural state, with possible disinfection, can be used for drinking and in the food industry, and surface waters for breeding noble species of fish (salmonids).
- Class II, waters that can be used in the natural state for bathing and recreation of citizens, for water sports, for breeding other types of fish (cyprids), or waters that can be used for drinking and in the food industry in addition to the usual processing methods (coagulation, filtration, disinfection, etc.).
- Class III, water that can be used for irrigation, and after the usual treatment methods in industry other than food industry.
- Class IV, waters which may be used for other purposes only after proper treatment.
- OC state - out of class state

The area in question belongs to the Danube River Basin, which means that the water should meet the provisions of the Class II of river waters. Data on surface water quality for the territory of the Republic of Serbia are maintained by the Environmental Protection Agency and are publicly available through the website www.sepa.gov.rs According to the examination results, the water quality on the stretch from the dam to the border with Bulgaria occasionally does not correspond to the prescribed quality in physico-chemical and microbiological terms. Deviations from the physico-chemical parameters are recorded at the concentration of TOC, total phosphorus and orthophosphate, and in microbiological terms at the total coliforms and the number of aerobic heterotrophs.

In 2024, in order to determine the zero state of wastewater quality and surface water quality of the Danube River for the construction of the Eco Energy complex, the Institute for Prevention, Occupational Safety, Fire Protection and Development DOO Novi Sad, branch "27. January" Niš carried out sampling and physico-chemical testing of the quality of waste and surface water. The results of the examinations of collective wastewater show that the concentrations of the examined parameters comply with the emission limit values prescribed by the Regulation on Emission Limit Values for Pollutants into Water and Deadlines

for Their Reaching.

The results of the examinations of surface water from the Danube River upstream of the wastewater discharge show that the concentrations of the examined parameters comply with the limit values prescribed by the Regulation on emission of limit values for pollutants in surface and groundwater and sediments and deadlines for their reaching and the Regulation on limit values of priority and priority hazardous substances that pollute surface waters and deadlines for their reaching.

The results of the examinations of surface water from the Danube River downstream of the wastewater discharge show that the concentrations of the examined parameters comply with the limit values prescribed by the Regulation on emission of limit values for pollutants in surface and groundwater and sediments and deadlines for their reaching and the Regulation on limit values of priority and priority hazardous substances that pollute surface waters and deadlines for their reaching.

Air

Air quality control is carried out in order to determine the level of air pollution and assess the impact of polluted air on human health, the environment and the climate, in order to take the necessary measures to protect the environment, human health and material goods.

The Environmental Protection Agency of the Republic of Serbia performs continuous monitoring of air quality in the state air quality monitoring network at the level of the Republic of Serbia and publishes the Annual Report on the State of Air Quality in the Republic of Serbia, which can be downloaded from the official website of the Agency. However, the municipality of Negotin, and therefore the settlement of Prahovo, is not covered by the network of automatic stations for air quality monitoring (AMSKV). The City Institute for Public Health Belgrade, at the request of Elixir Prahovo LTD, performed air quality monitoring for 15 days from 19 April - 3 May 2023 at measuring point 1: Dragiša Brebulović-Žmiga, 11 Vuka Karadžića Street, Prahovo (N 44°17'40.6", E 22°35'9.5"). Measuring point 1 (MP1) is 2.5 km northwest of the location of the project in question. During the measurement period, the following parameters were tested:

- Mass concentrations of suspended PM10 and PM2.5 particles;
- Total metal content (As, Cd, Pb, Ni, Cr) in the PM10 suspended particles fraction;
- Mass concentration of hydrogen fluoride (HF);
- Total phosphorus (P) content in the PM10 suspended particles fraction.

The results of the measurements show that all the tested parameters are in accordance with the Regulation on monitoring conditions and air quality requirements.

In addition to regular monitoring of air quality in the subject area, in order to monitor the impact of emissions into the air, the operator Elixir Prahovo Ltd. regularly monitors emissions of pollutants on all emitters 2 times a year, by hiring an authorised accredited laboratory, all in accordance with the adopted Monitoring Plan.

Noise

One of the important indicators of environmental quality is noise. In May 2024, the noise level in the open space was measured during the operation of the production facilities of ICP Elixir Prahovo, by the Institute for Prevention, Occupational Safety, Fire Protection and Development DOO, Novi Sad, Branch 27 January Niš.

Measurements were made in three periods, day, evening, night at three measuring points. The results of

the measurement show that the noise level at all three measuring points DOES NOT EXCEED the noise limit values for the periods day, evening and night, i.e. the test results are in accordance with the requirements of the Regulation on noise indicators, limit values, noise indicators assessment methods, annoyance and harmful effects of environmental noise during the regular operation of the Elixir Prahovo complex.

Climate factors

Negotinska Krajina is the most continental area of eastern Serbia, due to the warmest summers and the harshest winters. In the winter months, mercury in the thermometer descends to 30 ˚C below zero, while very often measurements during the summer show up to 40 ˚C in the shade.

Buildings, immovable cultural goods, archaeological sites and ambient units

The realization of the project in question is planned on undeveloped construction land located within the industrial zone. The cadastral parcels on which the Waste-to-Energy Plant and the Landfill for non-hazardous waste will be built are an integral part of the Technological Unit C – Zone IV - Energy and Ecological Island in accordance with the Second Amendments to the Detailed Regulation Plan for the Chemical Industry Complex in Prahovo.

According to the submitted records of the Institute for Cultural Heritage Preservation Niš (within the Act on the Conditions for the Preservation, Maintenance and Use of Immovable Cultural Heritage as well as Goods that Enjoy Prior Protection and Determined Protection Measures for the DRP of the Industrial Complex in Prahovo, No. 818/2 of 19 August 2013), there are no identified immovable cultural goods in the defined area.

Within the defined limits of the scope of the Detailed Regulation Plan for the subject area, there are no recorded natural and ambient units, as well as archaeological sites.

Landscape

The realization of the project in question is planned within the industrial zone where a belt of existing protective greenery was formed within the production part of the industrial complex and part of the complex for the production of phosphate mineral fertilizers, as well as protective greenery within the part of the industrial complex without production functions. The existing protective greenery within the industrial and part of the complex for the production of phosphate mineral fertilizers is in function of the purpose of the facilities and their protection against adverse impacts from the production process and is positioned to form a buffer zone between the industrial complex and the state road, as well as a buffer zone between the industrial complex and housing within the workers' settlement in the immediate vicinity.

Second amendments to the Detailed Regulation Plan envisage the formation of an additional protective green belt along the border of the complete industrial complex.

The interrelationship of listed factors

Taking into account all the above, it can be concluded:

- Waste-to-Energy utilization by thermal treatment of non-recyclable hazardous and non-hazardous liquid and solid waste (industrial, commercial and municipal) in order to obtain thermal energy used for the production of steam that will be further delivered and used for the operation of existing industrial plants within the Elixir Prahovo complex, mechanical pretreatment of waste and physical and chemical treatment of residues from the boiler plant, as well as disposal of the obtained non-reactive/non-hazardous solidificate by previous treatment to the Landfill for non-hazardous waste at the location in question is not in conflict with the Second Amendment to the Detailed Regulation

Plan for the chemical industry complex in Prahovo ("Official Gazette of the Municipality of Negotin", No. 17/22), and is fully compatible with the planned purpose of the space.

- The immediate environment of the Eco Energy complex in question consists of an area with a small degree of population, since it is an existing industrial zone.
- In the environment of the project in question, there are no registered protected natural resources, as well as rare, endangered and protected representatives of flora and fauna, or their habitats.
- There are no protected cultural goods in the immediate vicinity of the project site.
- During the regular operation of the subject Waste-to-Energy Plant and landfills of non-hazardous waste, there will be emissions of pollutants into the air, generation of wastewater, noise emissions, waste generation, but having in mind the location and envisaged protection measures (see Chapter 8) on the subject project, the mutual relations of these factors, i.e. possible accumulation with the effects of others, is minimized. In order to monitor the operation of the plant and potential environmental impacts, the Project Holder is obliged to regularly monitor environmental parameters in accordance with the monitoring plan prescribed in Chapter 9.
- By applying preventive measures in terms of treatment of air, wastewater, unpleasant odours, methods of organization and operation of the plant, it has been achieved that emissions from the plant are in accordance with the highest standards of the European Union, conclusions on the best available technologies and BREF documents.
- Regular operation of the plant will not adversely affect climatic conditions. The implementation of the project achieves a positive effect in terms of reducing the use of fossil fuels, reducing greenhouse gas (GHG) emissions and decarbonization of thermal energy for the ICP Elixir Prahovo complex.
- The positive effect due to the implementation of the project is also reflected in the reduction of the amount of waste that is permanently disposed of at non-sanitary landfills and landfills and the improvement of the municipal waste management system.

6.0. DESCRIPTION OF POSSIBLE SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT

The environmental impacts of the project that may occur are divided into three groups:

- impacts during the construction of the Eco Energy complex in question
- impacts under regular conditions of exploitation and
- impacts due to accidents.

By analysing the planned activities on the construction and during the regular operation of the future Eco Energy complex, the environmental impact was identified, assuming that the protective measures envisaged by the project documentation are applied during the construction and regular operation of the project.

6.1 Overview of possible changes in the environment during the execution of the project

Impact on air quality

The execution of construction works and landscaping lead to changes in the environment that are mainly limited to the immediate environment of the site where the works are performed. These impacts can be manifested by increased noise levels, exhaust emissions resulting from the operation of machinery on the construction site, as well as the dispersal of dust particles during earthworks and other construction works. The amount of pollutants decreases with distance from the emission source, so a temporary, short- term negative impact can only be expected on the site and the nearest environment.

Given the fact that the project in question is implemented within the existing industrial zone at the location of the existing chemical industry complex in Prahovo and that this impact is of temporary nature and limited only to the duration of construction and mechanical works, it can be concluded that **no significant negative impact on the environment is expected**.

Impact on water and soil quality

For the purpose of performing construction works of the planned facilities at the subject location, a construction site will be formed, within which prefabricated facilities will be installed, ground floor (office containers) in which there are working and auxiliary premises of common purpose (sanitary facilities, café kitchen, meeting room and warehouse space). Internal roads and plateaus for the movement of vehicles and employees will be formed within the construction site itself. Plateaus for parking freight vehicles, passenger vehicles and work machines will also be foreseen within the construction site. The construction site will be fenced with a wire fence to prevent unauthorized persons from entering the construction site. All hazardous substances (various chemicals such as machine oils, anti-corrosion protection coatings, resins, FP protection coatings, etc.), gas welding gases and burners (oxygen, nitrogen cylinders, etc.) will be stored in construction containers, on appropriate portable bundwalls and standard cylinder cages and under the strict control of the contractor and in accordance with the work plan of the construction site.

Despite all the aforementioned measures envisaged within the construction site, damage to construction machinery may occur during construction, i.e. the release of hazardous substances on the ground. Such discharges cannot significantly endanger the soil, as these are small quantities, and can be prevented by careful handling by trained workers, loading fuel into the machinery outside the construction site and regular maintenance of construction machinery, rapid response by taking measures to respond to the accident, for which the contractor is responsible. If hazardous substances are released to the ground,

it is necessary to immediately perform remediation by sprinkling the spill site with sorbent (e.g. sand, zeolite, wood sawdust, neutralizing agents, etc., which will provide the construction site) in order to collect spilled substances. The contaminated absorbent will be disposed of in the designated containers until it is handed over to authorized operators for further disposal.

During the construction of facilities in subject, waste generation is expected on the construction site itself. Expected types of waste are:

- construction waste (hazardous and non-hazardous)
- secondary raw materials
- packaging waste (hazardous and non-hazardous)
- municipal waste.

All waste generated on the construction site will be classified either as hazardous (packaging of various chemicals, etc.) or non-hazardous (municipal, metal, etc.) and will be placed in adequate separate containers/vessels until the moment of removal from the construction site. The transport of waste will be carried out by an authorized operator for the transport of this type of waste.

Earthworks include the execution of excavation according to detailed drawings, elevations and dimensions that will be defined by the Detailed Design. The space provided for the reception and temporary storage of soil must be organized in such a way as to allow access for sampling and analysis by an accredited laboratory. If, on the basis of the performed analyses, it turns out that soil is contaminated and has the characteristics of hazardous waste, it is necessary to hire an authorized operator who possesses the appropriate permit of the relevant Ministry of Environmental Protection, which will perform treatment of waste soil. The list of authorized operators holding waste management permits can be found on the website of the Environmental Protection Agency: http://www.sepa.gov.rs/index.php?menu=20174&id=20055&akcija=ShowExternal

In order to prevent the impact of construction works on the quality of soil and groundwater, it is necessary to store all construction waste in an organized manner at the designated places and timely transport from the location of the construction site, as well as material that may contaminate the environment on the construction site, packaging waste, etc., store it in closed facilities with a waterproof base that can be cleaned, install devices for evacuation of used water. All containers with liquid waste materials will be placed on bundwalls and protected from atmospheric influences.

Environmental protection at this stage of work is carried out by appropriate organization of work on the construction site as well as by careful handling of machines.

The impact of construction works is characterized as the impact of short duration and temporary character. Given the fact that during the construction, the environmental protection measures given in Chapter 8 of this study will be applied, it can be concluded that no significant negative impact on human health and the environment of the generated waste originating from the construction site is expected during the construction of the project.

Impact on noise level

Noise is a necessary consequence of the execution of works and is of temporary nature and only for the duration of the works. Construction machines and trucks that will be engaged during construction works represent a source of noise that reaches from 80 dB(A) to 90 dB(A), depending on the type of machine, degree of load, technical condition and method of operation. As the noise level decreases with distance

so that the increased noise level should not be expected at a distance greater than 50 m from the place of execution of works. There are no residential buildings or structures in the immediate vicinity of the site except those belonging to the Elixir Prahovo industrial complex.

Taking into account that all facilities are sufficiently far from the location in question, and that the duration of noise will be time limited, **no negative consequences for human health and the environment are expected**.

Meteorological parameters and climatic characteristics

The implementation of the project will not have any impact on the change of local meteorological and climatic characteristics.

Ecosystems

In accordance with the Decision of the Institute for Nature Conservation of Serbia (attached), the subject location where the construction of the Waste-to-Energy Plant and Landfill for non-hazardous waste is planned is not within the protected area for which the protection procedure has been implemented or initiated, as well as within the spatial scope of the ecological network of the Republic of Serbia, and therefore **has no impact** on them.

Therefore, the Study concluded that there are no registered rare, endangered, protected species of flora and fauna on the site itself that would be affected by the project, and that the impacts on the wider site are negligible.

Bearing in mind the position of the location where the construction of the plant in question is planned, the said Biodiversity Study also considered the potential of negative impacts of the construction and operation of the plant on the biodiversity of nearby areas of neighbouring countries (Romania and Bulgaria) and found that the **cross-border impacts of the construction and operation of the plant in question are negligible**.

The anticipated intensity of construction work on the facility does not include activities that cause impacts over a larger distance, nor in the downstream sector of the Danube. The impacts are expected to remain localized within the industrial zone, meaning that the construction of the facility will not affect the "Djerdap" National Park.

Population, concentration and migration of the population

The impact of the phase of execution of works on the population, concentration and migration of the population is not expected, since it does not include the relocation of the population on the site itself. Also, no activities are envisaged that would lead to the need to relocate parts of the surrounding settlements or population migration.

Purpose and use of surfaces

The subject site envisaged for the construction of the Eco Energy complex is located on undeveloped construction land belonging to the part of the Technological Unit C – Zone IV - Energy and Ecological Island in accordance with the Second Amendments to the Detailed Regulation Plan for the Chemical Industry Complex in Prahovo, therefore it completely fits into the defined purpose and use of the land.

Utility Infrastructure

The construction of facilities will not affect the electricity network facilities, since JSC "Elektromreža Srbije" has noted that there are no facilities owned by them in the immediate vicinity of the facilities in question.

PUC "Badnjevo", in accordance with the submitted conditions, noted that there is no data on the foul or atmospheric sewerage network present in the subject area.

In accordance with the obtained conditions of PE "Srbijagas", it was noted that there is no constructed gas pipeline network or facilities within the scope of the planned works, so there is no impact on them.

The conditions of Telekom Serbia also stated that there is no infrastructure of Telekom Serbia in the vicinity of the aforementioned facility, and therefore there is no impact on them.

Immovable cultural goods, etc.

In accordance with the above, it can be concluded that immovable cultural goods and archaeological sites cannot be endangered during the construction of this project, because the implementation of the project is planned within the existing chemical industry complex in Prahovo, where they do not exist.

Landscape characteristics of the area, etc.

The impact on the landscape during construction works is temporary and after the completion of the construction of facilities within the Waste-to-Energy Plant they will affect the change of the existing landscape within the industrial zones due to its visual characteristics (appearance of new facilities).

6.2 Overview of possible changes in the environment during the regular operation of the project

Impact on air quality

During the regular operation of the Waste-to-Energy Plant, the emission of pollutants will occur:

- From the emitter of the pretreatment and waste storage plant: particulate matter and unpleasant odours,
- From the boiler plant emitter: particulate matter, heavy metals, HCl, HF, SO_2, NO_x, CO, NH_3, TVOC, PCDD/F, CDD/F+ dioxins as PCBs, Hg,
- From the emitter of the stabilization/solidification plant: particulate matter.

Emitters of pretreatment plant and waste storage

During the process of storing solid waste materials inside the bunkers located in the facility W-C08 Pretreatment and waste storage, the emission of unpleasant odours and dust may occur. Removal of dust and unpleasant odours and prevention of their emission outside the facility is achieved by keeping the hall constantly under pressure, drawing air from the hall and burning it in the boiler plant. In cases where the boiler plant does not work (due to overhaul, downtime, etc.), the air from the waste storage facility will be directed to the bag filter system and activated carbon filter by means of a fan, where it is purified, and then the purified air is discharged into the atmosphere via

the emitter (smokestack) of the filter unit.

Air from the sludge compartment will also be taken to the boiler plant to prevent the spread of unpleasant odours outside the facility. When the boiler plant does not work, nitrogen is automatically introduced into the sludge receiving hopper in order to inertise the space.

The line for the treatment of hazardous waste (delivered in IBC containers, barrels, etc.) is of a closed type, and for the purpose of inertisation into the shredder chamber itself, nitrogen (N_2) is dispensed, so that emissions into the air will not occur in regular operation.

Emissions of easily volatile compounds may occur during the process of transfer and storage of liquid waste materials and the emission of unpleasant odours may occur. When transferring liquid waste from tank trucks to the gas phase arm, a pressure balancing line is connected, which represents the connection with the gas space of the tank to which the transfer is carried out in the event that the discharge is carried out into one of the tanks under overpressure of nitrogen, in order to prevent the evaporation of easily volatile liquids when discharging. In order to reduce air emissions from storage tanks, the tanks are equipped with:

- a nitrogen covering system that maintains a constant overpressure in the tanks,
- exhaust gas drainage system via automatic valves on the outlet pipelines from the gas tank space. When reaching a certain pressure in the tank, it leads to the opening of the valve and the release of gas that is taken by pipeline to the boiler plant for thermal treatment. As the vessels are maintained under nitrogen overpressure, the composition of the exhaust gas is predominantly nitrogen.

Boiler plant emitter

During the operation of the boiler plant, pollutants may be emitted into the air, namely: particulate matter, heavy metals, HCl, HF, SO_2, NO_x, CO, NH_3, TVOC, PCDD/F, CDD/F+ dioxins as PCBs, Hg.

For the treatment of flue gases generated during the incineration of waste, the project in question envisages a complex gas treatment system consisting of:

- Dry flue gas cleaning (cyclone and activated carbon reactor and bag filters),
- Wet flue gas cleaning in scrubbers,
- Selective catalytic filter.

The flue gas treatment system is described in Chapter 3. Project Description. The expected emission values of the pollutant are in accordance with the regulations of the Republic of Serbia and the values prescribed by the conclusions on the best available techniques.

Stabilization/solidification plant emitter

All sources of emission of particulate matter into the air from the stabilization/solidification process are equipped with bag filters on which particulate matter are separated (ash mixture and thickened sediment storage bunker in which the stabilization process takes place; mechanical treatment of slag or separation of ferrous metals using magnetic separators and non-ferrous metals using eddy current separators; mixer reactor in which the process of mixing cement, ash and water takes place or the solidification; cement storage silo; cement weighing scale and ash weighing scale). Air purified to a quality that meets the requirements of the applicable regulations of the Republic of Serbia as well as the requirements defined by the BAT conclusions for waste treatment plants is taken after the treatment to the emitter and discharged into the atmosphere.

Emissions from Landfill for non-hazardous waste

Rolled stabilized and solidified waste that will be disposed of at the subject Landfill for non-hazardous waste will not be subject to air pollution due to curing of its surface, but if this is observed during exploitation, the deposited material will be moistened with water. Landfill moistening water will be provided from the basin of atmospheric precipitations.

By the landfill increase in height, the external slope will be rehabilitated by placing a waterproof layer with a minimum thickness of 50 cm as a first, then a 20 cm drainage layer of gravel, over which a 50 cm thick humus layer will be laid. A geotextile with a minimum mass of 150 g/m^2 will be placed between the gravel and the humus layer. In this way, potential air pollution will be prevented and the surface runoff slowed down, which can be significant in the case of higher landfill heights.

Impact on groundwater and surface water quality

The hydrotechnical installations of the project in question provide solutions for: sanitary water, fire protection (hydrant water), foul sewage, clean rainwater sewage from the roofs of facilities, oily rainwater sewage from roads and plateaus and technological sewage. The project envisages separate sewerage with separate collection of water from the complex as well as plants for the treatment of all wastewater before their discharge first into the collection conduit and then into the final recipient.

On all water treatment systems, devices for water flow measuring are provided, as well as water quality measuring at the inlet and outlet of the plant before entering the recipient, i.e. collector, as corrective measures necessary in the event that some of the parameters do not meet the conditions for water discharging from the complex.

For continuous control and monitoring of possible groundwater pollution at the Elixir Prahovo complex, piezometers have been installed from which groundwater quality examinations are performed periodically according to the defined dynamics. The operator also regularly monitors the quality of wastewater and the quality of the recipient (Danube River), which will continue even after the construction of the project in question.

With the application of all envisaged measures of protection and treatment of wastewater, emissions into water from the plant will be in accordance with the highest standards of the European Union as well as with the conclusions on the best available techniques.

Impact on noise levels in the environment

During the exploitation of the complex in subject, noise is expected from traffic on the complex (freight vehicles that deliver waste and passenger cars with which employees and visitors come), as well as due to the operation of process equipment (pumps, shredders, cranes, mixer, fans, etc.). Noise protection must comply with the equipment manufacturer's instructions. Most of the equipment that emits higher- intensity noise will be located in closed facilities. The envisaged distance between the equipment is sufficient so that the noise level does not increase. Facilities that are not part of an indivisible technological whole are separated, in order to minimize noise levels. The plant itself is not near other noise emitters.

Since the facilities in question are located in an industrial zone, noise will not have a significant impact on the environment.

Impact on intensity of vibrations, heat and radiation

The equipment to be used will be placed on the appropriate substrate, which is why it is not expected to create vibrations, nor the impact of them on the environment.

During the exploitation of the Eco Energy complex, there will be no impact of heat emissions on the environment. At the location in question, devices that emit or produce ionizing radiation and non-ionizing radiation will not be used.

Meteorological parameters and climatic characteristics

The Waste-to-Energy Plant will play a significant role in waste management in accordance with the EU principles of the treatment hierarchy, since it converts non-recyclable waste into locally available energy and usable value products in an environmentally friendly manner and using modern technical and technological solutions, substitutes the use of fossil fuels, reduces greenhouse gas (GHG) emissions in relation to the disposal of waste in landfills, reduces the amount of waste disposed of in the environment and permanently removes hazardous and harmful substances that would contaminate soil, surface and groundwater and air by disposing of on the Landfill.

The operation of the Eco Energy complex will not have a negative impact on the change of climate factors.

Ecosystems

The location of the Eco Energy complex in question is within the chemical industrial complex, so there are no habitats and species that live on the site. Also, some of the established movements in this area have long since undergone changes, as a result of long-built industrial plants, three-shift-operation of equipment, constant presence of people and means of transport and fragmentation of the area by the construction of roads and railway tracks.

In addition to the impacts during the construction of the complex in question, the prepared Biodiversity Study also addresses the potential impacts on biodiversity during the regular operation of the complex. Based on the analysis of the narrower and wider area, it can be concluded that the implementation of this project **will not affect the plant and animal species that inhabit this area and its environment, and that cross-border residual impacts on biodiversity are not expected.**

Residual impacts of the operation of the facility on the "Djerdap" National Park can be characterized as negligible, given the park's distance from the complex and the application of best available techniques ensuring: planning and implementation of measures to prevent air, soil, and water pollution; the use of advanced material disposal technologies; and measures to prevent accidents. Accordingly, no residual impacts on the biodiversity of the "Djerdap" National Park are expected.

Population, concentration and migration of the population

The purposefulness of the construction of the Eco Energy Waste-to-Energy Plant in Prahovo is multiple and includes, among other things, significant economic and social benefits that can have a positive, long- term impact on the population, concentration and migration of the population.

The project in question is an environmentally friendly and sustainable solution, while respecting the prescribed conditions and measures of protection, minimization and prevention of potentially harmful impacts on the environment and the health of the population. The environmental benefits of this project are supported by the fact that the use of waste as a resource for energy production reduces the amount of waste disposed of in landfills, which directly reduces the negative impact of landfills on the environment, and the separated secondary raw materials (black and non-ferrous metals, plastics, etc.) are handed over to operators for recycling. The project also contributes to reducing the use of fossil fuels, thus reducing air pollution and reducing greenhouse gas emissions, while also reducing negative impacts on human health.

Creating new jobs by building the Eco Energy complex is an opportunity to achieve professional goals, benefits and good earnings.

The implementation and regular operation of the project can lead to the **immigration of residents** (the workforce that will be engaged in the complex in question), and it can be concluded that the project in question will **have an immediate, cumulative, permanent and long-term positive impact on the demography of the immediate environment**, given that according to statistical data (according to the 2022 census), currently the municipality of Negotin has unfavourable demographic trends that are reflected in the occurrence of an above-average negative natural increase, a high rate of emigration and the average age of the population compared to the rest of the Republic.

The realization of the project will enable **a positive and long-term impact on the quality of life in the municipality of Negotin** through the development of infrastructure and solving the problem of hazardous and non-hazardous industrial waste disposal, reducing the disposal of non-recyclable municipal waste to landfills.

Purpose and use of surfaces
As the location of the Eco Energy complex in question is within the industrial zone, the execution of the project in question does not require the occupation and loss of quality agricultural land, and will have no impact on the purpose and use of areas.

Utility Infrastructure
The location where the construction of the Eco Energy complex is planned is equipped with all the necessary utility infrastructure facilities and amenities. With the construction, existence and operation of the project in question, with the application of environmental protection measures, the negative direct, cumulative and long-term impact on the utility infrastructure (water supply network, electricity network, gas pipeline, public roads, etc.) will be minimized.

Immovable cultural goods, etc.
As previously noted, there are no identified immovable cultural goods in the defined area.

Landscape characteristics of the area, etc.
As the realization of the project in question takes place at the location located within the industrial zone of Prahovo, there will be no change in the landscape image at the location in question.

6.3 Overview of possible changes in the environment in the event of an accident

Significant negative impacts on the environment, as well as human life and health, can occur in the event of accidental situations such as fire outbreaks and spills or the release of hazardous substances. All accidental situations will be minimized by the prescribed accident prevention measures, adequate risk management and limiting the impact of that accident on human life and health and the environment.

In the event of an accident at the Eco Energy complex, the limits of the toxic effect of combustion products were analysed, after fires and explosions of explosive mixtures, raw materials and finished products, as hazardous substances, spills of hazardous substances, pollution of groundwater, which can lead to accidents with the worst consequences. It was noted that the worst-case scenario of an accident is level III of the accident: the level of the municipality or city.

In accordance with the above, the accidental situations at the Eco Energy complex will not lead to a cross- border impact.

To evaluate the possible impacts on individual environmental factors and the acceptability of the load on the environment, the most important impact components were taken into account, as follows:

- the intensity of the impact,
- duration and frequency of impact and
- prevalence of the impact.

Based on the changes they cause in the environment, according to the methodology of the Environmental Management System, impacts can have one of the following levels:

Impact level				
1. negligible	**2.** low	**3.** moderate	**4.** significant	**5.** catastrophic

During regular work, there is inevitably an impact on the environment, so the main task is to determine the level of identified impacts. After identifying the impacts and analysing them, their evaluation was carried out, on the basis of which we conclude that the environmental impacts **during the regular operation of the facility are negligible.**

Also, the identification of accidents that may occur, analysis and evaluation of the impact on the environment during the accident was carried out. An overview of the evaluated environmental impacts during regular operation and during an accident is given in Table 6.1.

Table 6.1 Evaluation of environmental impact in regular operation and during an accident

IMPACT	In regular operation	During an accident	
		fire	spillage
Impact on air quality – emission of pollutants	1	4	3
Impact on surface water quality	1	2	1
Impact on groundwater quality	1	1	2
Impact on soil quality	1	3	2
Impact on noise level quality	2	1	1
Impact on vibration intensity quality	1	1	1
Impact on radiation intensity	1	1	1
Impact on population health	1	2	1
Impact of meteorological parameters and climatic characteristics	3	1	1
Impact on the ecosystem	1	1	1
Impact on population, concentration and migration	3	1	1
Impact on the purpose and use of surfaces	1	1	1
Impact on utility infrastructure	1	1	1
Impact on natural and cultural goods of special values	1	1	1
Impact on landscape characteristics of the area	1	1	1

6.4 Assessment of the potential impact of the waste-to-energy plant and the non-hazardous waste landfill on public health in cross-border areas

This section evaluates the potential impact of the Waste-to-Energy (WtE) plant and the non-hazardous waste landfill on public health in cross-border areas.
The planned location of the Eco Energy complex is approximately 750 meters from the Romanian border. On the opposite bank of the Danube, on the Romanian side, lies undeveloped land. The closest Romanian settlements to the proposed location are:

- Izvoarele – located about 4 km north of the site, with a population of 951, according to the census.
- Gruja – a settlement and the administrative center of the municipality of Gruja, situated approximately 7 km east of the site. The population was 1,890, based on census data.

The plant's location is about 9 km from the Bulgarian border. The closest Bulgarian settlements are:

- Village of Balej – in Northwestern Bulgaria, Bregovo Municipality, Vidin Province, about 10.5 km from the site, with an estimated population of 437 in 2011.
- Village of Kudelin – also in Northwestern Bulgaria, Vidin Province, about 10.6 km from the site, with a population of 229 according to the 2021 census.

The Health Impact Assessment (HIA) serves as a multidisciplinary framework that enables the identification and quantification of both positive and negative project effects on public health. This assessment considers various health determinants, including air, water, and soil quality, noise levels, and specific vulnerable population groups.

The importance of cross-border health impact assessment

Waste incineration and landfill activities can significantly affect the environment and public health not only locally but also over a broader geographic area. Air pollution can travel long distances via atmospheric currents, while water and soil contamination can spread through surface and groundwater flows.

The cross-border impact assessment of emissions from the Eco Energy complex focuses on determining the potential effects of pollutants on air quality in neighboring countries, Romania and Bulgaria. This analysis is part of a comprehensive environmental impact assessment to ensure emissions remain within acceptable standards and do not pose risks to human health or ecosystems beyond Serbia's borders.

Conclusion on the cross-border impact of air contaminants

The analysis of pollutant emissions from the waste-to-energy facility indicates that the overall risks to health and the environment are minimal or negligible. Particular emphasis was placed on cross-border impacts, with modeling results showing that the risk to neighboring populations in Romania and Bulgaria is nearly imperceptible due to low dispersion values, the distance from populated areas, and the applied pollution control systems.

The nearest Romanian settlements are Izvoarele (4 km north) and Gruja (7 km east). On the Bulgarian side, the closest settlements are Balej (10.5 km) and Kudelin (10.6 km). Considering the plant's distance from the borders (750 m from Romania and 9 km from Bulgaria) and the high atmospheric dispersion capacity of pollutants, significant impacts on air quality beyond the industrial zone are not expected.

For most substances, including mercury, nickel, dioxins, and furans, the modeled air concentrations are thousands of times below internationally recognized air quality standards, such as those set by the World Health Organization (WHO). This confirms the effectiveness of the flue gas treatment systems and compliance with Best Available Techniques (BAT).[1]

Localized exceedances of particulate matter (PM10) and sulfur dioxide (SO2) were recorded only within the immediate industrial zone and occurred briefly under specific meteorological conditions. The highest modeled concentration of PM10, 97.76 mg/m³, is exclusively near the industrial complex, while the annual average remains significantly below regulatory limits. SO2 concentrations are localized and occasional, with the annual average emission staying within safe boundaries.

Based on the modeling results and the distances of neighboring settlements, there is no significant cross-border impact of emissions from the facility on air quality in Romania and Bulgaria. Emission control, air quality monitoring, and adherence to BAT standards ensure that potential impacts remain within safe limits and pose no risk to public health or the environment in neighboring countries.

Conclusion on the cross-border impact of water contaminants

Modeling emissions of pollutants in water indicates that all analyzed substances remain far below regulatory limits, minimizing any potential impacts on human health and ecosystems.

Pollutants are fully diluted in the Danube within a range of 100 to 200 meters downstream from the discharge point, posing no threat to Romanian and Bulgarian water bodies. Adopted technical solutions (as described in Chapter 3) provide sufficient protection to eliminate risks to human health on both local and cross-border levels. Additionally, preventive measures outlined in Chapter 8 and monitoring of wastewater discharge quality presented in Chapter 9 ensure robust prevention, control, and response mechanisms to minimize any operational risks to the environment. Finally, all modeled concentrations are several thousand times lower than international health and environmental standards (WHO, EPA, BAT-AEL).

Based on this data, cross-border water emissions impact on Romania and Bulgaria is not expected.

Impact on noise levels during facility operation

Given the distance of the facility from residential areas, natural barriers, and controlled working conditions, it can be concluded that there is no significant cross-border noise impact on settlements in Romania and Bulgaria. All noise sources are localized within the industrial zone, and protective measures further minimize potential environmental impacts.

[1] Conclusions on best available techniques for waste incineration (Commission Implementing Decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration) Dostupno na Implementing decision - 2019/2010 - EN - EUR-Lex (europa.eu)

Assessment of cross-border impact of emergency situations on human health

Technical details related to emergency situations are provided in Chapter 7, offering detailed risk modeling associated with the waste-to-energy facility and the non-hazardous waste landfill. This includes ecosystem exposure analysis and the evaluation of potential cross-border impacts. Prevention requirements are further elaborated in Chapter 8, Section 8.2, where protective measures are defined, taking into account specific ecosystem exposure factors and potential cross-border pollution.

Theoretically most harmful scenarios have been modeled and presented in Chapter 7 (Tables 7.18 and 7.15), with additional assessments conducted to determine the extent to which potential incidents might affect cross-border watercourses, particularly the Danube River and groundwater flows moving towards neighboring countries' borders.

The most frequent events involve accidents classified as relevant to the facility without implications for the industrial complex, significant to the overall industrial complex, and important from the municipality's perspective. There are no accident scenarios classified as regional or international, ensuring full compliance with the distance from cross-border municipalities in Bulgaria and Romania.

The accident with the furthest range extending beyond the project complex boundary involves ammonia water incidents, as the furthest reach of toxic concentrations is 680 meters. The effects of subsequent combustion remain within an 11-meter radius of the spill site, within the project complex boundaries.

From an additional precautionary perspective during the modeling phase, a specific scenario was defined that considers an emergency at the waste-to-energy facility to evaluate the impact of a potential accident on the Danube River. A mathematical model for a continuous pollution source was applied (see scenario 12 in Chapter 7 for details). This scenario focused on the uncontrolled release of particulate matter (PM) from the boiler system after a failure resulting in PM being emitted into the surrounding environment through the roof structure. This simulation aimed to assess the potential transport of harmful material to the Danube under emergency conditions.

Modeling results showed that pollutant levels (PM and calculated values of NH_3, HCl, HF, SO_2, and NO_x) were significantly below acceptable values, meaning that emergency situations at the waste-to-energy facility would not lead to pollution of the Danube River even in the worst-case scenario.

Based on the conducted analyses and modeling, it was concluded that even in the worst-case scenario, there is no cross-border impact on the territories of neighboring countries Bulgaria and Romania, nor on the Danube water body.

All measures deemed necessary within the project impact assessment, regulations, and required technologies are presented in Chapter 8 of this Study. These include measures to protect all environmental factors and human health (plans and technical solutions for environmental protection), related to the construction, regular operation, decommissioning, or removal of the project, as well as measures for accident prevention during construction and operation, response measures in case of accidents, and mitigation of potential accident consequences.

7.0. ENVIRONMENTAL IMPACT ASSESSMENT IN THE EVENT OF AN ACCIDENT

The sources of hazards in the project in question are:
- Leakage of hazardous substances,
- Fire and explosion.

Leakage of hazardous substances
Small-scale leaks may occur during storage of hazardous and non-hazardous waste. Waste storage will take place in the premises of facilities that have an impermeable substrate, equipped with equipment for the collection of unintentional spills, a fire protection system, adequate ventilation, physical security and protected from atmospheric influences. Movable bundwalls will be installed under the IBC containers and barrels containing liquid waste to prevent leakage due to accidental situations. Beside mobile bundwalls which will be provided for the collection of any leaked contents, sufficient number of appropriate absorbents for the collection and dry cleaning of the leaked contents (sawdust, sand, oil, alkalis and acid absorbents) will be provided as well. The operator will periodically check the structural integrity of the vessels (mechanical cracks) and the occurrence of leaks. In case of need, certain measures will be taken such as replacing the packaging (container), repairing accidentally spilled contents, etc. In order to carry out the aforementioned control smoothly, access to the hazardous waste storage should be easy and free for easy repackaging, measurement, sampling, transport, etc.

Storage tanks for liquid waste substances, in addition to being located in a closed facility with a waterproof base, will be located in reinforced concrete tanks of sufficient volume to receive the leaked liquid from one of the tanks (including the leak of the largest tank). All potentially leaked contents will be pumped into the appropriate tank using pumps and then treated in the boiler plant in question.

Line grates are planned at liquid transfer points (liquid waste transfer point and ammonia water transfer point), which will collect any leaked liquids during transfer and drain them to the collection pit. In this way, the possibility of possible leakage of the leaked fluid into the atmospheric sewerage and the surrounding soil is avoided.

Storage of all liquid raw materials (additives and other chemicals) will be carried out in appropriate containers placed on portable bundwalls of sufficient volume to accept the complete content of the containers.

Fire and explosion
An accident at the location in question may occur in the event of a fire and explosion. The greatest source of risk is the waste itself, which can contain components that can cause a spark. The process of mechanical pretreatment of different types of heterogeneous waste in shredders also represents a potential place of occurrence of fires and explosions. Fire and explosion can also occur due to the human factor, i.e. the use of open flames (cigarettes, etc.), malfunction of electrical installations, short circuit, natural disaster, etc. The greatest air pollution can occur in the event of a fire in which large quantities of toxic gases are generated during the combustion of waste materials: CO, NOx (expressed as NO_2), SO_2, HCl and soot.

For each planned facility at the Waste-to-Energy Plant, the basic requirements from the aspect of fire protection are defined in accordance with the applicable regulations in this area. In accordance with the technological process in the complex in question, the possibility of the existence of danger zones and their classifications was also considered. Dust and gas hazard zones were analysed.

The facilities in which the occurrence **of dust hazard zones** was analysed are:
- W-C16 dedusting system of the WC-12 facility,
- WC-09 non-hazardous waste pretreatment dedusting system in facility W-C08,
- Activated carbon dosing system.

Below is a table showing the zones of hazard by facilities.

Table 7.1 Zones of hazard by facilities

Facility	Item	Zones	Equipment class
W-C09	Dedusting system	Zone 21 inside the hopper Zone 22 after filter Zone 22 inside the filter, around the leakage site, sphere radius 1.5m	IIIc T165 ˚C
Activated carbon	/	Zone 21 inside the activated carbon container, inside the transport devices and the activated carbon dispenser and inside the ventilation system of the activated carbon container Zone 22 zone 1m around the end opening for ventilation of activated carbon containers	IIIc T165 ˚C

Facilities in which the occurrence of **zones resulting from explosive gases** was analysed are:

- Facility W-C08 (sludge methane)
- Facility W-C11 (natural gas)
- Facility W-C12 (hydrogen)
- Facility W-C13 loading point for tank trucks
- Facility U-C09 reducing station (natural gas)
- W-C16 Solidification filter system.

Table 7.2 gives an overview of hazard zones by facilities.

Table 7.2 Overview of zones of hazard by facilities

Facility	**Position**	**Zones**	**Equipment class**
W-C11	Inner compartment	**Hazard zone 2 (NE)** Secondary discharge on valve or pipeline flange.	There are no equipment requirements.
	Outdoor area around the relief valve	**Hazard zone 1** It exists in all directions from the Discharge Source, the extraction pipeline - safety/relief valve, to the limit of 1.0 m. **Hazard zone 2** It exists in all directions from the Discharge Source, the extraction pipeline - safety/relief valve, to the limit of 2.0 m.	IIa T1 (methane).
W-C13		**Zone 0** includes: the interior of the pipeline, piping joints and parts of the transfer point plant that are not constantly filled with liquid or that are not inertised. **Zone 1 includes:**	IIC T5 (liquid waste, the highest class adopted for safety).

		• Space of 1.5 m measured in all directions around the transferring device, the connection point at the transfer point and the connection on the transport tank to the ground level; • Space around the transfer pump 0.5 m measured from the dimensions of the pump in all directions to the ground level; • The interior of all recesses and channels below the terrain level. **Zone 2 includes:** • Space around the transferring device, the connection point at the transfer point and the connection on the transport tank, 3 m wide from Zone 1 measured horizontally and 1 m high measured from the ground level; • Space around the transfer pump, 3 m wide from Zone 1 measured horizontally and 1 m high from ground level • The space around the joints of pipelines, vents and similar parts of the transferring plant 3 m wide measured horizontally and up to ground level.	
U-C09		**Hazard zone 1** Exists in all directions, primary discharge when operating safety valve/relief valve to the limit of 1.0 m. **Hazard zone 2** Secondary discharge on the valve or pipeline flange at a distance of 1 m Exists in all directions, primary discharge when operating safety valve/ relief valve to the limit of 2.0 m.	IIa T1 (methane).
W-C08	Inner compartment – pretreatment of non-hazardous waste	**Hazard zone 2** Secondary discharge on the valve or pipeline flange at a distance of 1 m in all directions	IIC T3 (n-dodecane ($C_{12}H_{16}$))
W-C12	Inner compartment	**Hazard zone 2 (NE)** The formation of hydrogen from the stabilization and solidification process.	There are no requirements for equipment other than the ventilation fan of the space that has the IIC T1 requirement.
W-C16	Dedusting system	**Hazard zone 2 (NE)** The formation of hydrogen from the stabilization and solidification process	There are no requirements for equipment other than the ventilation fan

			of the space that has the IIC T1 requirement.

Based on the results of the fire risk assessment and the aforementioned regulations for the facilities, the following safety systems were adopted:

A. It is envisaged to protect the entire complex with an external hydrant network

B. Facility W-C01 Reception guardhouse and administrative building

a. Internal hydrant network
b. Fire detection system
c. Ventilation of the evacuation staircase via a window on the facade

C. Facility W-C02 – Operations Centre

a. Internal hydrant network
b. Fire detection system
c. Ventilation of the evacuation staircase via a window on the facade
d. Gas extinguishing of certain technical rooms

D. Facility W-C04 Pumping station and fire station

a. Internal hydrant network
b. Fire detection system
c. Stable extinguishing system in the pumping station part

E. Facility W-C08 Pretreatment and waste storage

a. Internal hydrant network (in an area with access for persons)
b. Fire detection system
c. Methane detection system in the sludge bunker area
d. Stable extinguishing system
e. Natural extraction of smoke system

F. Facility W-C11 Waste thermal treatment plant

a. Internal hydrant network
b. Fire detection system
c. Stable extinguishing system in the zone around the burner

d. Natural extraction of smoke

G. Facility W-C12- Stabilization and solidification

a. Internal hydrant network
b. Fire detection system (only in an area accessed by people)
c. Hydrogen detection system

H. Facility U-C02 Maintenance building and auxiliary systems facility

a. Internal hydrant network
b. Fire detection system
c. Natural extraction of smoke

Within the Waste-to-Energy Plant, a Pumping Station and a fire station (facility W-C04) are planned for rapid intervention at the site. The Elixir Prahovo complex has a trained and equipped environmental protection service, occupational safety, fire brigade (about 1200 m away from the Waste-to-Energy Plant), rescue unit (within the fire brigade), physical and technical security, etc. The fire brigade is on call at the Elixir Prahovo complex and is on standby to respond continuously for 24 hours. 4 firefighters are deployed in each shift. On-call duty is organized in three shifts. The firefighting unit of the operator Elixir Prahovo has means and equipment that are more extensive than defined by the Rulebook on the organization of fire protection according to the category of fire risk ("Official Gazette of RS", No. 6/2021), all in order to respond more adequately to possible accidents. The fire brigade within the Elixir Prahovo complex is located about 3 km from the Waste-to- Waste-to-Energy Plant. From the moment of receiving the call for intervention and the departure of the firefighting vehicle from the garage, the vehicle will arrive at the location of the Waste-to- Waste-to-Energy Plant in 4-5 minutes The fire brigade at the Elixir Prahovo complex has one firefighting vehicle, one tank truck and one off-road/van vehicle for the transport of equipment and other prescribed equipment. For each member of the fire brigade, a set of emergency uniforms are provided.

In addition to the aforementioned services at the location in question for firefighting intervention, as well as for the rescue of people and property endangered by fire or other natural disasters, the firefighters of the Fire Department in Negotin will intervene, at the address Ljube Nešić 3, as the nearest fire brigade, and, if necessary, other fire brigades from the surrounding area. Given the distance of the Negotin fire brigade of about 10.5 km and the speed of movement of the fire engine of about 50 km/h, the waiting time for the arrival of firefighters is approximately:

Time on call	2 min
Departure preparation time	1 min
Vehicle travel time around	15 min
Total	18 mins

The time of 18 minutes to start the intervention is considered favourable and provides effective protection in the event of a fire of higher intensity.

In order to determine the impact on human health and the environment and assess the risk of potential accidental situations at the relevant Waste-to-Energy Plant, based on the identification of hazards, an overview of the possible development of events (scenario) was given and accordingly an analysis of the consequences of a chemical accident and modelling of the effects of an accident according to the defined accident scenarios was performed. Based on the modelling of accident scenarios and consequences, an assessment of the risk of potential accidents was performed.

The risk of certain undesirable scenarios was assessed using the so-called risk matrix, which contains five categories of consequences of accidents, three categories of frequency or probability of occurrence of accidents and five categories of risks.

The scenarios were selected on the basis of identified critical points and properties of hazardous substances and effects that may occur (fire, release and spread of vapours and gases, equipment failure, etc.) in accidental situations. A total of 12 scenarios of major, moderate and minor accidents that could, with greater or lesser probability, occur in the facilities of the Waste-to-Energy Plant were analysed:

Scenario 1 - Accidents at the liquid waste transfer station

- minor accident, uncontrolled spillage of liquid waste followed only by burning of the spilled liquid waste, and
  - Pool fire: effect of heat flux
  - Toxic effect of combustion products
- a major accident, a tank truck caught in a fire in about 30 min (Worst chemical accident at the incinerator site) with a BLEVE effect (boiling liquid vapor explosion)
  - thermal effect from the fireball
  - destructive effect from the resulting shock wave
  - fractional effect of fragments resulting from the explosion of the tank of the tank truck.

Scenario 2 - Accident (waste fire throughout the bunker area) in the waste storage, i.e., in reception bunkers or mixing bunkers for solid hazardous waste

- toxic effect of combustion products
- direct effect of flames and thermal radiation

Scenario 3 - Fire with fuel tanks (on the floor)

- direct impact of fire and the effect of thermal radiation on other equipment in the room itself
- toxic effect of combustion products

Scenario 4 - Uncontrolled releases of liquid waste from IBC containers

- Accident scenario (discharge, emission and dispersion of pollution) with toxic substances
  - toxic effect of combustion products
- Accident scenario (discharge, combustion, dispersion of pollution) with combustible substances
  - toxic effect of combustion products
  - effect of thermal radiation

Scenario 5 - Accidents with waste sludges (methane emission from stored sludge with simulation of concentration change dynamics for different system operating regimes)

- change in methane concentration in the sludge reception bunker area

Scenario 6 - Accidents at the boiler plant and natural gas installation

- Boiler accidents
  - continuous release of flue gas outlet from the boiler, after dehermetization of one of the connecting points
  - damage to the boiler, with a complete discharge of the present vapor and mixture of liquid and solid phases from the current filling of the boiler
- Accidents on natural gas installation
  - ignition of gas after the formation of the output current – the formation of a flame jet,
  - initial gas dispersion, with subsequent explosion of the gas cloud or
  - initial gas dispersion, with subsequent ignition of the gas cloud.

Scenario 7 - Uncontrolled release of particulate matter from bag filters in the boiler plant

- uncontrolled release of particulate matter (PM)
- uncontrolled release of other pollutants (HCl, HF, SO_2, NO_2).

Scenario 8 - Forced release of flue gases to the stack without scrubbing in the scrubber system
- concentrations of hazardous substances in the flue gas (HCl, HF, SO_2 and NO_x)

Scenario 9 – Accidents at activated carbon dosers
- accumulation of coal dust and the occurrence of fires
- zone of the detonation wave caused by the explosion of the coal dust cloud

Scenario 10 - Accidents with ammonia water
- accident at ammonia water transfer station
  - toxic effects of hazardous substances
  - subsequent ignition of the cloud (Flash Fire)
- accident on ammonia water storage system
  - toxic effects of hazardous substances
  - subsequent ignition of the cloud (Flash Fire)

Scenario 11 - Accidents in the waste stabilization and solidification facility W-C12
- increase in the concentration of hydrogen in the event of fire

Scenario 12 - Modelling effects of hazardous substances emission in accident situations at the Waste-to-Energy plant on the Danube river
- Ammonia vapour emission, when discharging ammonia water from a tank truck (accidents scenario 10)
- Ammonia vapour emission, when discharging ammonia water from the storage tank (accidents scenario 10)
- Emission of PM particles, during the discharge of particulate matter from the boiler plant, and after the discharge of PM particles through the roof into the surrounding environment (accident scenario 7)

The following table provides an overview of the risk assessment at the Waste-to-Energy Plant for the defined scenarios.

Table 7.3 Risk assessment of accidents at the waste energy recovery plant according to defined accident scenarios

Overview of accident scenarios	Probability	Consequences	Risk
1. Accidents at the liquid waste transfer station	low	serious	moderate risk
2. Accident (waste fire throughout the bunker area) in the waste storage, i.e., in reception bunkers or mixing bunkers for solid hazardous waste	low	significant	low risk
3. Fire with fuel tanks (on the floor)	low	significant	low risk
4. Uncontrolled releases of liquid waste from IBC containers	moderate	significant	moderate risk
5. Accidents with waste sludges	low	significant	low risk
6. Accidents at the boiler plant and natural gas installation	moderate	significant	moderate risk

7. Uncontrolled release of particulate matter from bag filters in the boiler plant	moderate	of low importance	low risk
8. Forced release of flue gases to the stack without scrubbing in the scrubber system	moderate	of low importance	low risk
9. Accidents at activated carbon dosers	low	significant	low risk
10. Accidents with ammonia water.	moderate	significant	moderate risk
11. Accidents in the waste stabilization and solidification facility W-C12	low	significant	low risk
12. Modelling effects of hazardous substances emission in accident situations at the Waste-to-Energy plant on the Danube river	moderate	of low importance	low risk

Analysing the above, the probability of an accident occurring at the site of the Waste-to-Energy Plant is LOW and MODERATE, and the magnitude of possible consequences due to the accident may be LOW IMPORTANCE, SIGNIFICANT OR SERIOUS. The risk of an accident at the Waste-to-Waste-to-Energy Plant was assessed as a MODERATE RISK, and taking into account the designed prevention measures, as well as the accident response measures that will be implemented and the overall work in the safety management system at the location in question, this risk is ACCEPTABLE, i.e. it is possible to manage this risk.

For the Landfill for non-hazardous waste, accidental situations of **rupture of the HDPE geomembrane and direct contact of the contaminant with the soil** and **leakage of contaminated leachate from** the Landfill for non-hazardous waste into the aquifer due to the *rupture of the HDPE geomembrane* were considered, causing contamination of groundwater and, consequently, surface water of the Danube River.

In order to show the possible consequences of the aforementioned accidental scenarios and risk assessment, a modelling of the accident scenario of the migration of contaminants from the Landfill for non-hazardous waste was performed,

The analysis of the accident scenarios at the Landfill for non-hazardous waste shows that the probability of an accident occurring is assessed as LOW, and the magnitude of possible consequences due to the accident may be of LOW IMPORTANCE. The risk of an accident at the Landfill for non-hazardous waste was assessed as LOW RISK. Taking into account the designed prevention measures to be implemented and the overall work in the safety management system at the site in question, this risk is ACCEPTABLE, i.e. this risk can be managed.

A complete description of all designed prevention measures, as well as accident response measures that will be implemented and the overall work in the safety management system at the subject location of the Waste-to-Energy Plant and Landfill for non-hazardous waste is given in Chapter 8.

8.0. DESCRIPTION OF THE MEASURES ENVISAGED TO PREVENT, REDUCE AND, WHERE POSSIBLE, ELIMINATE ANY SIGNIFICANT ADVERSE IMPACT ON THE ENVIRONMENT

Protection measures to prevent the possible negative impact of the planned projects on the environment represent one of the most important parts of the Study, since they enable the competent inspection authority to control the implementation of the project and possible intervention in case of non-compliance with the defined legal obligations and environmental protection measures by the Project Holder.

By analysing the possible adverse effects of the planned Eco Energy complex construction project on the environment, certain measures and procedures can be identified that have been taken and that will provide the necessary conditions, which enable the impact of the project in question to be reduced to the limits of acceptability. For the project in question, the characteristics of the natural environment and the existing state of the environment were considered, along with the technical and technological characteristics of the planned activities, thus reducing environmental degradation and preventing possible adverse impacts on the environment.

The necessary measures to reduce or prevent adverse impacts can be systematized into the following categories:

1. Measures provided for by law and other regulations, norms and standards and deadlines for their achievement;
2. Measures to be taken in the event of an accident;
3. Environmental protection plans and technical solutions (recycling, treatment and disposition of waste materials, reclamation, remediation, etc.);
4. Other measures that may affect the prevention or reduction of harmful effects on the environment:
   - Protection measures during the construction of the project
   - Protection measures during the regular operation of the project
   - Protection measures in case of termination of use or removal of the project.

8.1 Measures provided for by law and other regulations, norms and standards and deadlines for their implementation

To reduce possible negative impacts during the construction and operation of the plant in question, and to ensure environmental protection within acceptable limits, all the usual protection measures provided by law will be applied. The measures envisaged by laws and other regulations include the application of norms and standards in the design, selection, and procurement of equipment for the proposed technological process. Additionally, technical measures will be implemented for the planned activities of waste-to-energy process, mechanical pretreatment of waste to be thermally treated, physical and chemical treatment of residues from the boiler plant, disposal of S/S waste at the Landfill for non-hazardous waste, as well as all accompanying activities.

In accordance with the requirements of the Law on Planning and Construction ("Official Gazette of RS", No. 72/2009, 81/2009 - corr., 64/2010 - CC, 24/2011, 121/2012, 42/2013 - CC, 50/2013 - CC, 98/2013 - CC, 132/2014, 145/2014, 83/2018, 31/2019, 37/2019 - other law, 9/2020, 52/2021, 62/2023) and the Rulebook on the content, manner and procedure of preparation and manner of control of technical documentation according to the class and purpose of facilities ("Official Gazette of RS", 96/2023):

- The Project Holder prepared the Preliminary Design and obtained **the Reports on the performed expert control of the Preliminary Design of the Construction of the Waste-to-Energy Plant and the Preliminary Design of the phase construction of the Landfill for non-hazardous**

waste[1]. In accordance with the aforementioned Reports, the Audit Committee of the Ministry of Construction, Transport and Infrastructure assessed that the technical documentation was complete and that it was accepted.

- The Project Holder is obliged to develop the Construction Permit Design (CPD) and its development is in progress, provide technical control of the project and, after obtaining the consent for the environmental impact assessment study, submit an application to the Ministry of Construction, Transport and Infrastructure for the issuance of a Construction Permit **for the construction of a waste-to-energy plant.** This is all in accordance with the Location Requirements issued by the Ministry of Construction, Transport, and Infrastructure, No. ROP-MSGI-32562-LOC-1/2023 of 22 November 2023, and the conditions of other competent authorities:
- Copy of the plot plan No. 952-04-155-21149/2023 of 12 October 2023, Republic Geodetic Authority, Real Estate Cadastre Service Negotin;
- Copy of the cadastral plan of lines No. 956-309-25298/202 of 11 October 2023, Republic Geodetic Authority Real Estate Cadastre Sector, Department for Lines Cadastre Niš;
- Water conditions of the Ministry of Agriculture, Forestry and Water Management No. 325-05-1/210/2022-07 of 14 November 2022 and notice No. 285878 2023 14843 000 000 000 001 of 7 November 2023;
- Requirements regarding fire and explosion protection measures No. 217-8864/23 of 11/04/2023 217-8865/23 of 13 October 2023, Ministry of the Interior, Emergency Situations Sector, Emergency Situations Department in Bor;
- Certified certificate, September 2023, MoI;
- Conditions of the public utility company "Badnjevo" Negotin No. 2962-06/2023-1 of 20 October 2023;
- Conditions of the Institute for Nature Protection No. 03 br. 021-3738/2 of 10 November 2023;
- Conditions of the Civil Aviation Directorate of the Republic of Serbia No. 4/3-09-0222/2022-0002 of 03.11.2022 and No. 4/3-09-0322/2023-0002 of 17 October 2023;
- Terms of Elektrodistribucija Srbije d.o.o. Belgrade, Branch Office Elektrodistribucija Zaječar, No. 2540400-D-10.08-452295/2-2023 dated 23 October 2023;
- Terms of Elektromreža Srbije No. 130-00-UTD-003-1393/2023 of 20 October 2023;
- Terms of Srbijagas No. 06-07-11/3213-1 of 31 October 2023;
- Terms of Telekom Srbija No. D211-442574/2-2023 of 13 October 2023.

- The Project Holder is obliged to develop the Construction Permit Design (CPD), which is currently in progress, provide technical control of the project, and, after obtaining consent for the environmental impact assessment study, submit an application to the Ministry of Construction, Transport, and Infrastructure for the issuance of a Construction Permit for the construction of the **Landfill for non-hazardous waste**. This must be done in accordance with the Location Requirements issued by the Ministry of Construction, Transport, and Infrastructure, No. ROP-MSGI-27919-LOCA-7/2023 of 18 August 2023, as well as the conditions set by other competent authorities:
  - Copy of the plot plan No. 952-04-155-21149/2023 of 12 October 2023, Republic Geodetic Authority, Real Estate Cadastre Service Negotin;
  - Water conditions of the Ministry of Agriculture, Forestry and Water Management No. 325-05-13/125/2023-07 of 17 August 2023;
  - Opinion of the Public Water Management Company Srbijavode 7615/1 of 25 July 2023;
  - Opinion of the Environmental Protection Agency No. 325-00-00001/252/2023-02 of 25 July 2023;
  - Opinion of the Republic Hydrometeorological Institute No. 922-1-223/2022 of 1 November 2022 and No. 922-1-130/2023 of 21 July 2023;

[1] Report on the Expert Review of the Peliminary Design for the Construction of a Waste-to-Energy Facility, Ministry of Construction, Transport, and Infrastructure, No. 000186359 2024 14810 005 000 000 001 of March 26, 2024, and Report on the Expert Review of the Preliminary Design for the Phase Construction of the Landfill for non-hazardous waste, Ministry of Construction, Transport and Infrastructure, No. 000186359 2024 14810 005 000 000 001 of August 06, 2024

- Conditions of the Institute for Nature Protection No. 03 br. 021-2591/2 of 3 August 2023;
  - Terms of Elektromreža Srbije No. 130-00-UTD-003-1399/2023 of 14 November 2022;
  - Conditions of the public utility company "Badnjevo" Negotin No. 3296-06/2022-1 of 04.11.2022 and No. 953-06/2023-1 of 13 April 2023;
  - Notice No. 217-6494/23 of 27 July 2023, Ministry of the Interior, Emergency Situations Sector, Emergency Situations Department in Bor, Preventive Protection Department;
  - Notification of Srbijagas No. 06-07-11/3321 of 27 October 2022;
  - Terms of Telekom Srbija No. D211-430019/2-2022 of 20 October 2022.

- To determine the suitability of facilities for use, preliminary tests and inspections shall be conducted on installations, devices, plants, stability or safety of the facility, devices and facilities for environmental protection, fire protection devices or other tests, in the manner provided for in the technical documentation, during the previously approved trial operation and shall inform the competent authority thereof without delay. The probationary period may last a maximum of one year. It is the obligation of the Project Holder to monitor the results of the trial operation.

- During the trial operation of the facility, perform guarantee measurements and demonstrate energy efficiency in accordance with the project documentation and the requirements of BATC WI (Commission Implementing Decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration), BAT 20, Table 2.

- Upon completion of all the aforementioned works, the Project Holder shall obtain the **Certificate of occupation** for the subject facilities no later than five years from the date the building permit decision becomes final.

In accordance with the provisions of the Law on Integrated Prevention and Control of Environmental Pollution ("Official Gazette of RS", No. 135/2004, 25/2015, and 109/2021) and the Regulation on the types of activities and facilities for which an integrated permit is issued ("Official Gazette of RS", No. 84/2005), it is the obligation of the Project Holder, after the probationary period and obtaining the Operating Permit, and before the commencement of operations, to submit an application for the issuance of an integrated (IPPC) permit for the following activities:
"*5. Waste management*

5.1. Installations intended for the disposal or reuse of hazardous waste with a capacity exceeding 10 tons per day[2]

5.2. Municipal waste incineration plants with a capacity exceeding 3 t/h[3]

5.3. Non-hazardous waste disposal facilities with a capacity of over 50 tons per day[4]

[2] *As defined in the list referred to in Article 1 (4) of Directive 91/689/EEC and as defined in Annex IIA and Annex IIB (operations R1, R5, R6, R8 and R9) to Directive 75/442/EEC and in Council Directive 75/439/EEC of 16 June 1975 on the disposal of waste oils.*

[3] *As defined in the Council Directive 89/369/EEC of 8 June 1989 on the prevention of air pollution from new municipal waste incineration plants, as well as in Council Directive 89/429/EEC of 21 June 1989 on the reduction of air pollution from existing municipal waste incineration plants.*

[4] *As defined in Annex IIA to Directive 75/442/EEC, under headings D8 and D9."*

In addition to the above, the Integrated Permit for the plant in question will be obtained in accordance with the following regulations:

- Law on Environmental Protection ("Official Gazette of RS", No. 135/2004, 36/09 and 36/2009 - other law, 72/2009 - other law and 43/2011 – CC decision, 14/2016 and 95/2018);
    - Regulation on criteria for determining the best available techniques, for applying quality standards, as well as for determining emission limit values in an Integrated Permit ("Official Gazette of RS", No. 84 of 4 October 2005);
    - Rulebook on the content, appearance and manner of filling in the application for the issuance of an integrated permit ("Official Gazette of RS", No. 30 of 11 April 2006, 32 of 30 March 2016, 44 of 8 June 2018 - other law, 4 of 19 January 2024);
    - and other relevant environmental regulations.

8.1.1 Measures envisaged within the Waste-to-Energy Plant

- Waste treatment is carried out using the best available techniques and technologies (Article 37 of the Law on Waste Management):

- The Waste-to-energy plant was designed based on the technology of the Austrian company "TBU Stubenvoll" GMBH, which has proven references with plants of a similar type throughout Europe. The applied technology **complies with the highest EU standards and BAT**:
    - Commission implementing decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration (notified under document C (2019) 7987) – **Conclusions on the best available techniques for waste incineration**
    - Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU of the European Parliament and of the Council (notified under document C (2018) 5070) (Text with EEA relevance.) – **Conclusions on best available techniques for waste treatment**
    - European Commission, Reference Document on Best Available Techniques on Emissions from Storage, July 2006 – **Best available techniques on Emissions from Storage**
    - JRC Reference Report on **Monitoring of Emissions to Air and Water from IED Installations**, Industrial Emissions Directive 2010/75/EU (Integrated Pollution Prevention and Control), 2018.

The treatment of waste materials (hazardous and non-hazardous waste) will be carried out in accordance with the following legal acts:

- Law on Waste Management (Official Gazette of RS, No. 36/2009, 88/2010, 14/2016, 95/2018 - other law and 35/2023);
- Law on Packaging and Packaging Waste (Official Gazette of RS, No. 36/09, 95/18);
    - Rulebook on waste categories, examination and classification ("Official Gazette of RS", nos. 56/2010, 93/2019 and 39/2021);
    - Rulebook on the form of the document on the movement of hazardous waste, the form of prior notification, the manner of its delivery and the instructions for their completion ("Official Gazette of RS", No. 17/2017);
    - Rulebook on the Form of Documents for Waste Movement and Instructions for Completion ("Official Gazette of RS", No. 114/13);
    - Rulebook on the form of Daily Records and Annual Report on waste with instructions for its completion ("Official Gazette of RS", No. 7/2020 and 79/2021);
    - Rulebook on the Conditions, Methods, and Procedures for Waste Oil Management ("Official Gazette of RS", No. 71/2010);
    - Regulation on the Method and Procedure for Managing Sludge from Municipal Wastewater Treatment Plants ("Official Gazette of RS", No. 103/2023);
    - Regulation on the Manner and Procedure for Managing Construction and Demolition Waste ("Official Gazette of RS", No. 93/2023, 94/2023 - Corr.).

In accordance with Article 26 of the Law on Waste Management, the waste producer (defined as an entity whose activity generates waste or whose prior treatment, mixing, or other procedures result in a change in the composition or nature of the waste), in this case, the Elixir Craft Project Holder, Eco Lager Branch, is also required to undertake the following activities:

- Develop a **Waste Management Plan** in accordance with Article 15 of the Law and organize its implementation if the annual production exceeds 100 tons of non-hazardous waste or 200 kilograms of hazardous waste;
- Obtain a report on the testing of waste from authorized and accredited laboratories, renew it in the event of a change in technology, a change in the origin of raw materials, or other activities that might affect the characteristics of the waste, and retain the report for five years. After this period, the obligation is to obtain a new waste testing report;
- Ensure the application of the principles of the Waste Management hierarchy;
- collect the generated waste separately and sort it according to the need for future treatment;
- Temporarily store waste in a way that does not affect human health and the environment and provide conditions to avoid mixing of different types of waste, as well as mixing of waste with water;
- Perform startup/shutdown operations in such a way that the first/last waste introduced into the boiler contains a minimal amount of organic halogenates;
- Hand over the waste to a person authorized to manage it if waste management cannot be organized in accordance with the Law;
- Keep records of waste generated, handed over or disposed of;
- Designate a person responsible for waste management;
- Enable the competent inspector to control the locations, facilities, plants and documentation.
- The waste producer may either manage waste treatment independently or must transfer it to another legal entity or entrepreneur engaged in waste treatment activities. Alternatively, waste may be handled through an intermediary, waste trader, public utility company, public-private partnership, or exported if there is no facility for treating the specific waste in the Republic of Serbia.

In accordance with Article 29 of the Law on Waste Management, the operator of the waste treatment plant (mechanical, waste thermal treatment and physical and chemical treatment of waste), in this case the Project Holder is obliged to:

- Draw up the **Plant Working Plan** as specified in Article 16 of the Law, and ensure its implementation and updating (every three years, as well as in the event of significant operational changes to the plant);
- Develop an accident protection plan in accordance with the Law;
- Obtain a waste treatment permit and perform waste treatment activities in accordance with that permit;
- Publish a list of waste for the treatment of which it is authorized;
- Operate the waste treatment equipment and plant in accordance with the relevant technical instructions;
- Secures waste and protects it from scattering and leakage;
- In the event of an accident, notify the competent authority without delay in accordance with the Law;
- Keep records of waste in accordance with the Law;
- Designate a qualified person responsible for professional work in the waste treatment plant;
- Charges for waste treatment services in the plant;
- Enable the competent inspector to supervise the locations, facilities, plant and documentation.

In accordance with Article 41 of the Waste Management Law ("Official Gazette of RS", Nos. 36/2009, 88/2010, 14/2016, 95/2018 - other law, and 35/2023) and Article 7 of the Regulation on technical and technological conditions for designing, constructing, equipping, and operating facilities and types of waste for thermal treatment, emission limit values, and their monitoring ("Official Gazette of RS", No. 103/2023), the project holder is obliged to obtain, before acquiring the integrated IPPC permit, a permit for thermal waste treatment by incineration from the competent Ministry of Environmental Protection, Waste Management Department. This permit must, in addition to prescribed operating conditions, include the following:

1. Types of waste that can be treated in accordance with specific regulations on waste categories, testing, and classification, if possible with data on the quantity of each type of waste;
2. Total capacity of the incineration or co-incineration facility;
3. Emission limit values;
4. Data on pH values, temperature, and flow rate of discharged wastewater, flow rate, and all other wastewater quality parameters as required by competent authorities;
5. Methods and timelines for sampling and measuring to ensure compliance with conditions for monitoring emission limits;
6. Maximum permitted operating time during periods of technical interruptions or malfunction of pollution control and monitoring equipment, as well as transitional periods for facility operation and its components, including measures for cessation of operations in case of emergencies;
7. Data on the highest and lowest ignition points of waste to be thermally treated, the highest and lowest calorific values of waste, maximum content of polychlorinated biphenyls, chlorine, sulfur, heavy metals, and other substances emitted by the facility;
8. Information on the method of measuring air emissions;
9. The average composition of mixed municipal waste planned for incineration.

- The project defines that waste cannot be temporarily stored at the location of the waste producer /owner for more than 36 months, after the expiration of which the waste must be handed over for treatment, i.e. reuse or disposal (Article 36 of the Law on Waste Management).

- It is envisaged that non-hazardous and hazardous waste whose storage and treatment is planned at the location in question must be stored and treated in the prescribed manner and treated in accordance with the following provisions ***of the Rulebook on the conditions and manner of collection, transport, storage and treatment of waste used as secondary raw material or for obtaining energy ("Official Gazette of RS", No. 98/2010):***

  - The storage of waste to be used for a secondary raw material or to obtain energy shall be carried out in such a way as to ensure the protection of the environment and human health.
  - Person collecting waste used for secondary raw material or to obtain energy:
    1) take over waste used for secondary raw material or to obtain energy from the waste owner;
    2) keep records of the collected and handed over quantities of waste used as secondary raw material or to obtain energy.
  - The waste storage used for secondary raw material is designed as a closed type storage, fenced and under constant supervision.
  - Waste cannot be stored in the area or on surfaces not intended for storage.
  - A waste storage facility used for secondary raw material or to obtain energy is designed as a storage specifically to include:
    1) a stable and impermeable substrate with adequate protection against atmospheric influences;
    2) an accident prevention system;
    3) a system for the complete controlled reception of atmospheric water from all manipulative surfaces;
    4) fire protection system in accordance with special regulations.

Hazardous waste is classified according to the origin, characteristics and composition that make it hazardous, in accordance with the regulation governing the category, testing and classification of waste. Hazardous waste whose storage is planned at the location in question must be stored in the prescribed manner and treated in accordance with the following provisions ***of the Rulebook on the Method of Storage, Packaging and Labelling of Hazardous Waste ("Official Gazette of RS", No. 92/2010 and 77/2021):***

- Storage of hazardous waste will be carried out in a way that ensures the lowest risk of endangering human life and health and the environment;
- Hazardous waste will be stored in tanks, containers and other vessels within the storage facility;
- Wood waste containing hazardous substances will be stored in a closed storage facility, on a solid stable substrate with spillage collection equipment and degreasing agents;
- The qualified person responsible for professional work is responsible for handling hazardous waste during storage, in accordance with the governing Law Waste Management;
- Hazardous waste will be stored in a way that provides easy and free access to stored hazardous waste for control, repackaging, measurement, sampling, transport, etc.;
- The storage will be fenced according to the design in order to prevent access to unauthorized persons, physically secured, locked and under constant supervision;
- Records shall be kept of all activities related to the storage of hazardous waste, in accordance with the governing Law Waste Management and special regulations;
- The hazardous waste storage container should be closed and made of material that ensures the stability of storage according to the chemical impact of the waste itself, impermeability with adequate protection against atmospheric influences.
- Hazardous waste storage containers, with all their components, should be chemically resistant to the impact of hazardous waste contained in them.
- Liquid storage of waste is carried out in a storage container provided with an impermeable bundwall that can accommodate the entire amount of waste in the event of an accident (leak).
- Hazardous waste storage containers, with all their components, should be chemically resistant to the impact of hazardous waste contained in them.
- Hazardous waste storage containers are regularly maintained, cleaned and not used after the expiration of the established shelf life.
- Storage containers are regularly inspected through regular checks of containers and their components for damage, leakage, corrosion, or other form of damage.
- If the hazardous waste storage container or any of its components is technically defective, corroded, or visibly damaged, the hazardous waste must be transferred to a technically sound container in a safe and prescribed manner.
- During storage, hazardous waste is packaged and labelled in a way that ensures safety for human health and the environment.
- Hazardous waste is classified according to the origin, characteristics and composition that make it hazardous, in accordance with the regulation governing the category, testing and classification of waste.
- If hazardous waste consists of several types of waste, its classification is based on the most common component.
- Hazardous waste management will be carried out in accordance with the conclusions on best available techniques (Commission Implementing Decision (EU) 2018/1147 of 10 August 2018

establishing best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU of the European Parliament and of the Council (notified under document C(2018) 5070) (Text with EEA relevance.) – **Conclusions on best available techniques for waste treatment** and European Commission, Reference Document on Best Available Techniques on Emissions from Storage, July 2006 – **The Best Available Techniques on Emissions from Storage**).

In addition to the measures specified by the Regulation on Technical and Technological Conditions for the Design, Construction, Equipment, and Operation of Facilities and Types of Waste for Waste Thermal Treatment, Emission Limit Values, and Their Monitoring ("Official Gazette of RS", No. 103/2023), air protection will also be implemented in accordance with the following regulations:

- Law on Air Protection ("Official Gazette of RS", No. 36/2009, 10/2013 and 26/2021 - other Law);
  - Regulation on Conditions for Monitoring and Air Quality Requirements ("Official Gazette of RS", No. 11/2010, 75/2010, and 63/2013);
  - Regulation on the Measurement of Emissions of Pollutants into the Air from Stationary Sources of Pollution ("Official Gazette of RS", No. 5/2016 and 10/2024);
  - Regulation on the Limit Values of Emissions of Pollutants into the Air from Stationary Pollution Sources, except for Combustion Plants ("Official Gazette of RS", No. 111/2015, 83/2021); as well as Commission implementing decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration (notified under document C(2019) 7987) – **Conclusions on best available techniques for waste incineration** and Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU of the European Parliament and of the Council (notified under document C(2018) 5070) (Text with EEA relevance.) – **Conclusions on best available techniques for waste treatment**.

In accordance with Article 58 of the Law on Air Protection, the Project Holder is obliged to:

- Submit data on the stationary source of pollution and any change (reconstruction) to the Ministry of Environmental Protection, i.e. the Environmental Protection Agency and the competent authority of the local self-government unit;
- Ensure regular monitoring of emissions in accordance with the monitoring plan, Chapter 9 of this study and the integrated permit, and to keep records thereof;
- Provide continuous emission measurements when prescribed for certain pollutants and/or sources of pollution, either independently or through automatic continuous measurement devices, with the consent of the Ministry;
- Provide emission control measurements through an authorized legal entity, if it performs emission measurements independently;
- Provide the prescribed periodic emission measurements, through an authorized legal entity, twice a year, if it does not perform continuous emission measurements;
- Ensure air quality monitoring at the order of the competent inspection authority, independently or through an authorized legal entity;
- Keep records of the performed measurements with data on measuring points, results and frequency of measurements and submit the data in the form of a prescribed report to the Ministry or the Agency within the prescribed deadline.
- Keep records of the type and quality of raw materials, fuels and waste in the incineration process;
- Keep records of the operation of devices for the prevention or reduction of emissions of pollutants, as well as measuring devices for measuring emissions.

Regulation on Technical and Technological Conditions for the Design, Construction, Equipping, and Operation of Plants and Types of Waste for Waste Thermal Treatment, Emission Limit Values, and Their

Monitoring ("Official Gazette of RS", No. 103/2023), water protection will also be implemented in accordance with the following legal acts:

- Law on Waters ("Official Gazette of RS", No. 30/2010, 93/2012, 101/2016, 95/2018 and 95/2018 - other Law);
  - Rulebook on Hazardous Substances in Waters ("Official Gazette of SRS", No. 31/1982);
  - Rulebook on Parameters of Ecological and Chemical Status of Surface Waters and Parameters of Chemical and Quantitative Status of Groundwater ("Official Gazette of RS", No. 74/2011);
  - Rulebook on the Manner and Conditions for Quantity Measurement and Wastewater Quality Testing and the Content of the Report on Measures Performed ("Official Gazette of RS", No. 18/2024);
  - Regulation on Water Classification ("Official Gazette of SRS", No. 5/1968);
  - Regulation on the Categorization of Watercourses ("Official Gazette of the SRS", No. 5/1968 - other law);
  - Regulation on Limit Values of Pollutants in Surface and Groundwater and Sediment and Deadlines for Achieving Them ("Official Gazette of RS", No. 50/2012);
  - Regulation on Limit Values of Priority and Priority Hazardous Substances Polluting Surface Waters and Deadlines for Achieving Them ("Official Gazette of RS", No. 24/2014
  - Regulation on Limit Values of Emissions of Pollutants into Water and Deadlines for Achieving Them ("Official Gazette of RS", No. 67/2011, 48/2012 and 1/2016);
  - Regulation on the Ecological Network ("Official Gazette of RS", No. 102/2010).
  - Water Management Strategy on the Territory of the Republic of Serbia until 2034 ("Official Gazette of RS", No. 3/2017).

- In accordance with the Law on Waters ("Official Gazette of RS", No. 30/2010, 93/2012, 101/2016, 95/2018, and 95/2018 - other Law), as well as the by-laws and obtained Water Conditions, it is the obligation of the Project Holder to obtain water consent and a water permit.
- It is the obligation of the Project Holder to partially or completely remove pollutants in water as well as to treat wastewater, in accordance with the aforementioned law and special laws governing the field of environmental protection, i.e. regulations adopted based on those laws.
- Wastewater treatment will be carried out to a level that corresponds to the emission limit values or to a level that does not violate the environmental quality standards of the recipient, in accordance with the regulations of the Republic of Serbia governing the limit values of pollutants in surface and groundwater, the limit values of priority, hazardous and other pollutants and the regulation governing the limit values for the emission of pollutants into water, as well as the values defined by the conclusions on the best available techniques (BATC)[2], taking a more stringent criterion, which in this case represent the BAT values.
- The project holder is obliged to set up devices for measuring and continuously measure the quantities of wastewater, to examine the parameters of wastewater quality and their impact on the recipient, to keep the reports on the performed measurements for at least five years and to submit them to the public water management company, the ministry responsible for environmental protection and the Environmental Protection Agency once a year.
- The Project Holder is obliged to measure the quantities and test the quality of wastewater before and after treatment, to ensure the regular functioning of devices, facilities, i.e. wastewater treatment plants and to keep a log of their operation.
- If there is an imminent danger of pollution, i.e. pollution of surface and groundwater, the Project Holder is obliged to take measures to prevent, i.e. to reduce and remediate water pollution and to plan the means and deadlines for their realization.
- Wastewater, surface and groundwater quality testing may be performed by a legal entity authorized by the Ministry to perform these activities.

[2] Commission implementing decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration (notified under document C (2019) 7987) – Conclusions on best available techniques for waste incineration

Land protection will be carried out in accordance with the following legal acts:

- Law on Soil Protection ("Official Gazette of RS", No. 112/2015);
  - Rulebook on the List of Activities That May Be the Cause of Soil Pollution and Degradation, Procedure, Data Content, Deadlines, and Other Requirements for Soil Monitoring ("Official Gazette of RS", No. 102/2020);
  - Rulebook on the Methodology for the Development of Rehabilitation and Remediation Projects ("Official Gazette of RS", No. 74/2015);
  - Rulebook on the Content and Form of Soil Monitoring Reports ("Official Gazette of RS", No. 126/2021);
  - Regulation on Systematic Monitoring of Soil Condition and Quality ("Official Gazette of RS", No. 88/2020);
  - Regulation on Limit Values of Pollutants, Harmful Substances, and Hazardous Materials in Soil ("Official Gazette of RS", No. 30/2018 and 64/2019).

- In accordance with Article 30 of the Law on Land Protection, the owner or user of the land or plant, whose activity may be or is the cause of soil pollution and degradation, in this case Elixir Craft, the Eco Energy branch shall monitor the land in accordance with this Law, in such a way that:
  - presents data on the quality of the soil before the start and after the completion of the activity;
  - monitors changes of the soil and in the soil in the prescribed manner in the zone of impact of its
  - submit data on changes in the soil and in the soil to the Ministry and the Environmental Protection Agency.
- Soil sampling and analysis of soil quality parameters shall be performed by an authorized organization in accordance with the Law on Soil Protection.

Noise protection will be carried out in accordance with the following legal acts:

- Law on Environmental Noise Protection ("Official Gazette of RS", No. 96/2021);
  - Rulebook on the Content and Methods for Creating a Strategic Noise Map and Action Plan, the Procedure for Presenting Them to the Public, and Their Formats ("Official Gazette of RS", No. 90/2023);
  - Rulebook on Noise Measurement Methods, the Content and Scope of Environmental Noise Measurement Report ("Official Gazette of RS", No. 139/2022);
  - Regulation on Noise Indicators, Limit Values, Noise Indicators Assessment Methods, Annoyance and Harmful Effects of Environmental Noise ("Official Gazette of RS", No. 75/2010.
- In accordance with Article 10 of the Law on Environmental Noise Protection, legal entities that, through their activities, affect or may affect noise levels exceeding the limit values are obliged to ensure the following: participation in the costs of environmental noise protection, including investment, operational, and production costs; monitoring the impact of their activities on noise; and the implementation of appropriate noise control measures and sound protection in accordance with this Law and the applicable environmental protection legislation.
- In accordance with Article 23 of the Law on Environmental Noise Protection, the Project Holder is obligated to measure environmental noise levels periodically, at least once every three years.
- Noise measurements from individual sources shall be conducted in accordance with the regulations specified in Article 18, paragraph 3 of the aforementioned Law.
- Noise monitoring is conducted through systematic observation of noise indicators and the assessment of the impact of noise on the environment.

In accordance with the Rulebook on the Methodology for Developing the National and Local Register of Pollution Sources, as well as the Methodology for Types, Methods, and Deadlines for Data Collection ("Official Gazette of RS", Nos. 91/2010, 10/2013, 98/2016, 72/2023, 53/2024), data for the National Register of Pollution Sources must be submitted to the Environmental Protection Agency by March 31 of the current year for the previous year's data. Reports for the National Register are to be submitted

electronically by entering data into the National Register's information system, in accordance with regulations governing electronic documents, electronic identification, and trusted services in electronic business. Reports on measurements of emitted pollutants into the air and water should be submitted in electronic form (pdf format) to the relevant email address published on the Agency's website.

In addition to the aforementioned legal acts, during the work, comply with the following regulations:

- Law on Nature Protection (Official Gazette of RS, No. 36/2009, 88/2010, 91/2010 - corr., 14/2016, 95/2018 - other Law and 71/2021);

Accident/fire protection will be carried out in accordance with the following legal acts:

- Law on Fire Protection ("Official Gazette of RS", No. 111/2009, 20/2015, 87/2018 and 87/2018 - other Laws);
  - Rulebook on the Organization of Fire Protection According to the Category of Fire Risk („Official Gazette of RS", No. 6/2021);
  - Rulebook on Technical Norms for the Protection of Storages from Fire and Explosions ("Official Gazette of SFRY", No. 24/1987);
  - Rulebook on Technical Norms for Fire Protection of Industrial Facilities ("Official Gazette of RS", No. 1/2018, 81/2023);
  - Rulebook on Technical Norms for Installations for the Hydrant Fire Extinguishing Network ("Official Gazette of RS", No. 3/2018);
  - Rulebook on Technical Norms for the Protection of Facilities from Atmospheric Discharge ("Official Gazette of SRY" No. 11/1996)
  - Rulebook on the Minimum Content of the General Part of the Training Program for Workers in the Field of Fire Protection ("Official Gazette of the SRS", No. 40/1990).
  - Rulebook on Technical Norms for the Protection of Electric Power Plants and Devices from Fire ("Official Gazette of SFRY", No. 74/90)
  - Rulebook on Technical Norms for Fire Protection of Residential and Commercial Buildings and Public Facilities ("Official Gazette of RS", No. 22/2019)
  - Rulebook on Technical Norms for Access Roads, Turnpikes, and Arranged Plateaus for Firefighting Vehicles in the Vicinity of a Facility with an Increased Risk of Fire ("Official Gazette of FRY" No. 8/95);
  - Rulebook on Technical Requirements for Fire Safety of External Walls of Buildings ("Official Gazette of RS", No. 103/2018)
  - Regulation on the Classification of Buildings, Activities, and Land into Fire Hazard Categories ("Official Gazette of RS", No. 76/2010);

- It is the obligation of the Project Holder to prepare the Main Fire Protection Design as part of the design and technical documentation along with the Construction Design and to obtain the approvals from the Ministry of the Interior.

- The Project Holder is obligated to contact the relevant Ministry of the Interior to assess the categorization of facilities, activities, and land based on fire risk. This assessment should consider the technological processes occurring within the facilities; the type and quantity of materials produced, processed, or stored; the materials used in the construction of the facility; the facility's importance and size; and the type of plant cover. This is necessary to establish the appropriate organization and implement the measures needed for effective fire protection.

- Entities in the first and second fire risk categories are required to develop a Fire Protection Plan, obtain approval from the relevant authority, and follow the procedures outlined in the Fire Protection Plan. The Fire Protection Plan should, among other things, provide detailed information on the number of firefighters, the technical equipment and training of the fire brigade, the organization of fire protection preventive measures, continuous duty, and the number of trained personnel for fire protection implementation. Facilities classified in the third fire risk category must establish Fire Protection Rules.

- For individual units of the facility for which fire protection is determined by special regulations, standards and other acts governing the field of fire and explosion protection, fire protection measures provided for by these regulations have been applied as follows:

  - For equipment and installations related to ventilation and air conditioning, the necessary fire protection measures required to meet the basic fire protection standards are prescribed in the Rulebook on Technical Norms for Ventilation and Air Conditioning Systems ("Official Gazette of SFRY", No. 38/89 and "Official Gazette of RS", No. 118/2014).
  - The standard SRPS EN 12845 was applied for the design of the automatic fire extinguishing system (sprinkler installation);
  - For the design of a stable system for automatic fire detection and alarm, the Rulebook on Technical Standards for Stable Fire Alarm Installations and the standard SRPS EN 54 were applied.

- The Project Holder is obligated to obtain a decision from the competent Ministry of the Interior of the Republic of Serbia, determining the facility's suitability for use in terms of implementing the fire protection measures specified in the technical documentation, in accordance with Article 36, Paragraph 2, Item 4 of the Law on Fire Protection.

- Law on Explosive Substances, Flammable Liquids and Gases ("Official Gazette of SRS", No. 44/1977, 45/1985 and 18/1989 and "Official Gazette of RS", No. 53/1993 – other Law, 67/1993 - other Law, 48/1994 - other Law, 101/2005 - other Law, 54/2015 - other Law) and according to the above, Ex zones were determined where the Ex-equipment will be installed;
- Law on Flammable and Combustible Liquids and Flammable Gases ("Official Gazette of RS", No. 54/2015).
  - Rulebook on Technical Standards for Fire and Explosion Safety of Facilities and Structures for Flammable and Combustible Liquids and for the Storage and Transfer of Flammable and Combustible Liquids („Official Gazette of RS”, nos. 114/2017 and 85/2021);

- Law on Disaster Risk Reduction and Emergency Management ("Official Gazette of RS", No. 87/2018
  - Rulebook on the Content of Information on Hazards, Measures, and Procedures in Case of Accidents („Official Gazette of RS", No.18/2012);
  - Regulation on Compulsory Means and Equipment for Personal, Mutual and Collective Protection Against Natural and Other Disasters ("Official Gazette of RS", No. 3/2011 and 37/2015).
  - Regulation on the Content, Manner of Preparation and Obligations of Entities Related to the Preparation of Disaster Risk Assessment and Protection and Rescue Plans ("Official Gazette of RS", No. 102/2020).
  - Rulebook on the Organization and Method of Operation of the Fire and Rescue Unit ("Official Gazette of RS", No. 66/2021);
  - Rulebook on the Manner of Preparation and Content of the Accident Protection Plan ("Official Gazette of RS", No. 41/2019);
  - Rulebook on the Type and Quantity of Hazardous Substances on the Basis of which the Accident Protection Plan is Drawn Up ("Official Gazette of RS", No. 34/2019);
  - Regulation on the Implementation of Evacuation ('Official Gazette of RS', No. 22/2011);

Pursuant to the provisions of the Seveso Directive, Article 58 of the Law on Environmental Protection (Official Gazette of RS, No. 135/2004, 36/2009, 36/2009 - Other Law, 72/2009 - Other Law, 43/2011 - Decision of the Constitutional Court, 14/2016, 76/2018, and 95/2018) and the Rulebook on the List of Hazardous Substances and Their Quantities and Criteria for Determining the Type of Documents Produced by the Operator of Seveso Installations or Establishments ("Official Gazette of RS", No. 41/2010, 51/2015, and 50/2018), and considering the maximum possible quantities of hazardous

substances that may be present at any time in the complex, the facility in question is classified as a "higher-tier" Seveso plant. Therefore, it is the obligation of the Project Holder, in terms of managing accident risk, to:

- In accordance with the Rulebook on the Content of the Notification on the New Seveso Plant or Complex, Existing Seveso Plant or Complex and on the Permanent Cessation of Operation of the Seveso Plant or Complex ("Official Gazette of RS", No. 41/2010), submit the Notification on the New Seveso Plant or Complex at least three months before the start of operation;
- In accordance with the Rulebook on the Content of the Accident Prevention Policy and the Content and Methodology for Preparing the Safety Report and the Accident Protection Plan ("Official Gazette of RS", No. 41/2010), prepare the Safety Report and the Accident Prevention Plan and submit them to the competent authority at least three months prior to the commencement of operation;
- to submit a request for approval of the Safety Report and Accident Protection Plan, along with the required documents.

Management of raw materials/chemicals will be carried out in accordance with the following legal acts:

- Law on Chemicals (Official Gazette of RS, No. 36/2009, 88/2010, 92/2011, 93/2012, 25/2015);
  - Regulations on the List of Classified Substances (Official Gazette of RS, No. 41/2023);
  - Rulebook on the Classification, Packaging, Labelling and Advertising of Chemicals and Products in accordance with the UN Globally Harmonized System of Classification and Labelling ("Official Gazette of RS" No. 105/2013, 52/2017, 21/2019, 40/2023);
  - Rulebook on the Content of the Safety Data Sheet ("Official Gazette of RS", No. 11/2024)
  - Rulebook on the Register of Chemicals ("Official Gazette of RS", No. 16/2016, 6/2017, 117/2017, 44/2018 - other Law, 7/2019, 93/2019, 6/2021, 126/2021, 20/2023 and 10/2024).
- The packaging of dangerous chemicals must correspond to the properties, purpose and method of use of the chemical or product and must be labelled in the prescribed manner.
- It is the responsibility of the Project Holder to keep records on chemicals, which in particular contain data on the identity of the chemical, distributors and quantities of chemicals
- All chemicals used must have a safety data sheet, which in particular contains the identification of the chemical, data on the properties of the chemical, the method of use, preventive measures, risk reduction measures and data on the supplier of the chemical.
- The Project Holder is obliged to store dangerous chemicals in such a way that they do not endanger the life and health of people and the environment.
- The Project Holder is obliged to collect, store and safely dispose of the residues of dangerous chemicals and empty packaging in accordance with the regulations governing waste management.

8.1.2 Measures provided for within the framework of the Landfill for non-hazardous waste

The Landfill for non-hazardous waste is designed to complete the process and manage the residues from the fluidized bed boiler plant (unburned solid residues such as slag, ash, sludge/thickened sediment from wastewater treatment), which have been previously stabilized and solidified through physical-chemical treatment, as close as possible to their point of origin, all in accordance with the Law on Waste Management ("Official Gazette of RS", No. 36/2009, 88/2010, 14/2016, 95/2018 - other Law, and 35/2023), Regulation on disposal of waste on landfills ("Official Gazette of RS", No. 92/2010) and the principles of Waste Management.

- In accordance with Article 30 of the Law on Waste Management, the operator at the landfill (Project Holder) is obliged to, and accordingly, the Project Holder will:

- Develop the **Plant Working Plan** as specified in Article 16 of this Law and ensure its implementation and updating;
- Develop an Accident Protection Plan in accordance with the law;
- Obtain a waste disposal permit and dispose of waste in accordance with that permit;
- Implement measures to ensure environmental protection, in accordance with regulations;
- Establish monitoring of the operation of the landfill during the active and passive phase of work;
- Ensure the reclamation of the landfill after its closure and perform expert supervision of the landfill or location for a period of at least 30 years, with the aim of reducing risks to human health and the environment;
- In the event of an accident, notify the competent authority without delay in accordance with the Law;
- Keep records of waste in accordance with the Law;
- Designate a qualified person responsible for professional work at the landfill;
- Enable the competent inspector to control the locations, facilities, plants and documentation.
- The operator at the landfill is obliged, in accordance with the aforementioned law, to refuse to accept waste that does not meet the requirements for waste disposal from the permit or to refuse to accept waste when mixed with some other waste, i.e. it poses a risk to human health or the environment. The operator is obliged to inform the licensing authority about the refusal to accept waste.

- In accordance with Article 42 Law on Waste Management:
  - Disposal of waste at the landfill shall be carried out if there is no other appropriate solution, in accordance with the principle of the Waste Management hierarchy.
  - Waste shall be treated before disposal in accordance with the provisions of this Law and other regulations.
  - The waste is disposed of at a landfill that meets the technical, technological and other conditions and requirements, in accordance with the permit issued based on the aforementioned Law.
  - The acceptance of waste at the landfill will be carried out according to the procedures set forth in the relevant regulation:
    - Regulation on the Disposal of Waste at Landfills ("Official Gazette of RS", No. 92/2010)
    - Rulebook on Waste Categories, Examination and Classification ("Official Gazette of RS", No. 56/2010, 93/2019 and 39/2021): Disposal of non-reactive hazardous waste at Landfill for non-hazardous wastes.
    - EU Landfill Directive: (Directive (EU) 2018/850 of the European Parliament and of the Council of 30 May 2018 amending Directive 1999/31/EC on the landfill of waste);
  - Prior to disposal, the landfill operator shall ensure the verification of the delivered waste, including its characterization, identification by type, quantity, and properties, by determining the waste mass and reviewing the accompanying documentation before acceptance.

Article 59a of the Law on Waste Management ("Official Gazette of RS", No. 36/2009, 88/2010, 14/2016, 95/2018 - other Law, and 35/2023) and the Regulation on the Type of Financial Guarantees and Equivalent Insurance ("Official Gazette of RS", No. 103/23) stipulate that the Operator, and thus Elixir Craft, Eco Energy Branch, is obligated to provide a financial guarantee and equivalent insurance to ensure the proper conduct of waste management activities.

- The landfill operation procedure will be carried out in accordance with the technical and technological conditions provided for in the design and technical documentation, permit, law and the Regulation on the Disposal of Waste at Landfills ("Official Gazette of RS", No. 92/2010).
- It is the obligation of the Project Holder to monitor the operation of the landfill in accordance with the proper technological procedure and legal obligations (Article 26):
  1) monitoring of meteorological parameters;
  2) surface water monitoring;
  3) monitoring of leachate;
  4) groundwater monitoring;

5) monitoring the amount of rainwater;
6) landfill stability monitoring;
7) monitoring of protective layers;
8) monitoring of pedological and geological characteristics.

- It is envisaged by the project that the monitoring will be carried out by sampling and measurement in the manner given in Appendix 6. – Monitoring the operation of the landfill, which is printed with the Regulation on the Disposal of Waste at Landfills ("Official Gazette of RS", No. 92/2010) and forms an integral part thereof.

- Sampling and measurement will be carried out:

  1) in a laboratory where certain tests are performed daily;

  2) in an accredited laboratory at certain intervals prescribed by this Regulation or more frequently, if the data in the landfill laboratory show that there has been any accident situation or deviation from the parameters defined by the permit.

- All data obtained by monitoring shall be submitted as part of the regular Annual Reports that the Project Holder is obliged to submit to the Environmental Protection Agency.

8.2 Measures to be taken in the event of an accident

By applying the aforementioned protective measures, which are carried out in accordance with technical standards in the fields of construction, electrical engineering, technology, and mechanical engineering for the construction of facilities of this type and purpose, with strict application to the relevant regulations and operational instructions, regular technical inspections of the facility, and proper maintenance, accident situations (such as fires, explosions, spills, etc.) are avoided. In the event of accidental situations, emergency interventions of a local character will be carried out, in accordance with the appropriate instructions and Rulebooks. If the accident situations are of a larger scope, the coordination of remediation will be carried out in cooperation with the competent institutions.

8.2.1 Accident Prevention and Preparedness Measures

8.2.1.1 Accident Prevention and Preparedness Measures During Construction Works of Waste-to-Waste-to-Energy Plant

The following will be implemented within Elixir Craft, a branch of Eco Energy:

- All contractors and employees involved in the construction of facilities will be trained and familiarized with the necessary procedures and instructions for the work activities, including the handling of hazardous substances in accordance with their Safety Data Sheets, waste management (both hazardous and non-hazardous), equipment and means, fire protection measures, occupational safety and security measures, as well as environmental protection measures (both preventive and remedial);

- To prevent the leakage of hazardous materials from construction machinery and stored materials, impermeable sheeting and appropriate containers (bundwall) must be placed under construction machinery and temporary storage areas for materials and hazardous chemicals (paints, varnishes, thinners, coatings, etc.), equipment, and tools. Any intervention on the engaged machinery, such as servicing, will be prohibited if contact with hazardous materials has occurred;

- All construction and other materials that may contaminate the environment (various insulating materials, paints, ACP, coatings, thinners, etc.) on the construction site should be stored in closed facilities, with a waterproof floor covering that can be cleaned.

- At the construction site, it is necessary to provide sufficient quantities of absorbents and degreasing agents (sand, zeolite or other sorbent) in case of spillage of harmful substances (petroleum products, oils, chemicals, etc.), all according to the plan of organization and operation of the construction site.
- In case of leakage of small quantities of oil and other fluids, fuel, wastewater (polluted) and the like, it is necessary to carry out emergency localization and remediation. First, take all measures to prevent further leakage, and then sprinkle the place with sand, zeolite or other sorbent. Dispose of the soiled sorbent in special containers and ensure its collection through an authorized operator in accordance with the previously obtained Waste Test Report.
- The management of chemicals/hazardous substances will be carried out in accordance with the manufacturer's recommendations and the associated Safety Data Sheets.
- Only small quantities of hazardous and harmful substances for surface and groundwater and soil may be kept at the site in so-called handy storages, in the amount necessary for daily/weekly construction needs, which must always be adequately secured against leaks/spills.
- When painting, varnishing, and similar works at the location in question, large quantities of paint and varnish must not be used. This is especially true for solvents and other chemicals that evaporate very easily and have a very low lower explosive limit (< 1 vol.%).
- During construction, carry out all necessary measures with flammable materials that can cause fire (boards, beams, slats, flammable chemicals, etc.). Keep such materials away from ignition sources.
- Flammable liquids (gasoline, oil, various oils, anti-corrosion protection agent, paints, etc.) should be stored in special storages protected from fire in accordance with applicable regulations.
- Electroenergetic installation, devices and equipment must comply with the applicable technical regulations by their construction and execution.
- In all places on the construction site where there is a risk of fire, implement protective measures according to the Law on Fire Protection.
- The site administration is responsible for the implementation of these measures. Control of the implementation of these measures is carried out by the site manager, the supervising engineer and the authorized body of the municipality or the Republic.
- Ensure the environment of the welding area by placing appropriate warning signs:
    - FIRE HAZARD
    - RESTRICTED ACCESS TO THE UNEMPLOYED.
- Workers who perform complete works must be trained in handling initial fire extinguishers, to know to whom and how to report in case they are unable to extinguish the initial fires.
- Maintain roads in a condition that ensures the safety of traffic and people.
- Organize traffic with vehicles and construction machines in such a way as to reduce the likelihood of traffic accidents, idling, unnecessary dust raising and noise generation;
- Collect and remove sanitary water from the construction site by installing temporary sanitary cabins. The maintenance of these cabins should be entrusted to a specialized authorized company, which will regularly discharge them;
- Upon completion of the construction of the facility, it is necessary to arrange the construction site and remove all remains of the material, as well as construction and other materials.
- The management of construction waste shall be ensured continuously during the execution of works in accordance with the Law on Waste Management and the Construction and Demolition Waste Management Plan, to which the consent of the competent ministry for environmental protection has previously been obtained.

- Construction waste must be separately collected, sorted, transported, stored, prepared for reuse, and/or disposed of.

The construction waste management measures to be applied are as follows:

- Extraction of useful components that are not considered waste in accordance with the law governing waste management and that can be reused for the same purpose for which they were produced (brick, tile, etc.);
- Prevention of mixing of hazardous and non-hazardous waste from construction and demolition and mixing of different types of waste;
- Preventing the dispersal, spillage, discharge of hazardous waste into soil, surface and groundwater and air;
- Determination of places for temporary storage of construction waste at the place of origin, i.e. at the construction site;
- Testing and classification of construction waste;
- Execution of works in such a way as to prevent the generation of waste;
- Encouraging the reuse and recycling of construction waste;
- Keeping records and reporting on the amount and type of construction waste generated, as well as the treatment to which it is subjected.
- Reporting on the types, quantities and characteristics of produced, treated and disposed waste from construction shall be carried out in accordance with the law governing waste management.
- The owner of construction waste is obliged to ensure that hazardous construction waste is first separated on the construction site, to prevent the mixing of hazardous construction waste with non-hazardous construction waste.
- The owner of the construction waste is obliged to obtain a report on the testing of the waste generated on the construction site.
- Waste from construction and demolition should be collected in containers or appropriate bags of sufficient strength and load-bearing capacity for the waste to be collected in them. Containers or bags should be placed on the construction site where the construction works are carried out.
- Containers and bags must be made in such a way that the transport of waste from construction to the waste management plant is carried out without transfer and in a safe manner without danger to human health and the environment.
- Hazardous waste from construction should be collected in closed containers or bags, which possess approvals issued by the competent authority and which are marked in accordance with a special regulation.
- The owner of the construction waste temporarily stores the waste on the construction site where it was created, by storing it separately, by types of construction waste in accordance with the waste catalogue and separately from other waste, in a way that does not pollute the environment.
- Construction waste may be temporarily stored on the construction site until the completion of the works for which the construction permit has been issued, and at the latest until the submission of the application for the issuance of a decision on the use permit.
- The owner of the construction waste is obliged to ensure the transport of that waste to the facility for storage and/or treatment of construction and demolition waste, respecting the waste management hierarchy.
- Transport waste in such a way that it does not mix the sorted waste, or in such a way that it does not pollute other substances so that its reuse, utilization or recycling is not prevented or feasible without disproportionately high costs.
- Transport of hazardous waste from construction should be carried out in accordance with the regulations on the transport of dangerous goods.
- Transport of non-hazardous and hazardous construction waste should be carried out in accordance with the regulations on waste management and road transport.
  The owner of construction and demolition waste may either treat the waste independently or transfer it to an operator who holds a permit for treating this type of waste.
- The costs of treatment, including reuse and/or disposal of construction waste, shall be borne by the owner of the waste.
- Non-hazardous construction waste can be treated with R1 to R12 reuse operations.

- If possible, hazardous construction waste will be treated with disposal operations (D operations) or reuse operations (R operations).
- The possibility will be considered that construction waste determined by the test report to be inert waste can be used to cover landfills, if it meets the limit values of the parameters for the disposal of inert waste.
- Non-hazardous construction waste can be disposed of at inert waste landfills, if it meets the limit values of inert waste disposal parameters.
- Certain types of non-hazardous construction waste may also be disposed of in sanitary landfills of non-hazardous waste, if the waste has been previously treated and if it meets the limit values of the parameters for the disposal of non-hazardous waste.
- Hazardous waste from construction may be permanently stored at the location for which the consent for permanent storage issued by the competent authority of the local self-government unit on whose territory that location is located has been obtained.
- Hazardous waste from construction and demolition can be disposed of at sanitary landfills for hazardous waste, which have a permit issued by the competent authority for the disposal of the specified waste.
- Certain types of hazardous construction waste can be disposed of at landfills for non-hazardous waste that have specially designated cells for the disposal of such hazardous waste, provided that the waste has been pre-treated through surface curing and solidification processes, in accordance with a permit issued by the competent authority.
- All contractors and employees must complete training covering procedures related to waste management.

8.2.1.2 Accident Prevention and Preparedness Measures During Routine Operations

- Fire protection at the plant complex in question is designed in accordance with the applicable regulations of the Republic of Serbia.
- As part of the design and technical documentation within the Preliminary Design, in accordance with the Law on Fire Protection, regulations, standards and norms in the field of fire protection and the rules of the profession, the document Fire Protection Study and Hazard Zone Analysis were prepared, which define all preventive protection measures.
- All equipment and devices are designed in accordance with the characteristics of the substances with which they come into contact. All installed equipment is duly attested and supplied with the necessary attestation documentation.
- Analysis of the microlocation of the facility from the aspect of fire transmission to adjacent facilities and from adjacent facilities, as well as the possibility of fire and rescue units coming to the intervention and accessing the facilities with a fire intervention vehicle.
- Access to the facilities by a fire intervention vehicle is enabled by local existing roads in the Elixir Prahovo industrial zone and internal roads designed as part of the plant.
- Internal roads can be accessed by all facilities with at least one facade. In accordance with Article 5 of the Rulebook on Technical Norms for the Protection of Storages from Fire and Explosions (Official Gazette of SFRY No. 24/87), and by classifying the storage, the access of the fire engine to this storage is provided from a minimum of 3 sides. The boiler plant can be accessed from 3 sides.
- Access roads have characteristics that satisfy all the requirements of the Rulebook on Technical Norms for Access Roads, Ring Roads, and Arranged Platforms for Fire-fighting Vehicles Near the Facility of Increased Risk of Fire ("Official Gazette of FRY", No.8/95):
  - Load-bearing capacity of the roadway with 130 kN axle load,
  - the minimum width of the roads for one-way movement of the vehicle is 3.5 meters, and for two-way movement 6 meters,
  - Vertical clearance of 4.5 meters,
  - Inner curve radius of 7 meters and outer curve radius of 10.5 meters,
  - Maximum gradient of 6%.

- Within the Waste-to-Energy Plant, a Pumping Station and a fire station (facility W-C04) are planned for rapid intervention at the site. The Elixir Prahovo industrial complex has a trained and equipped environmental protection service, occupational safety, fire brigade, rescue unit (within the fire brigade), physical and technical security, etc. In addition to the aforementioned services at the location in question for firefighting intervention and for the rescue of people and property endangered by fire or other natural disasters, the firefighters from the Fire Department in Negotin, located at Ljube Nešić 3, will respond as the nearest fire brigade. If necessary, additional fire brigades from the surrounding area will also be called upon.
- The fire brigade within the Elixir Prahovo complex is about 3 km away from the Waste-to-Waste-to-Energy Plant. From the moment of receiving the call for intervention and the departure of the fire truck from the garage, the vehicle will arrive at the location in 4-5 minutes.
- Given the distance of the Negotin fire brigade of about 10.5 km and the speed of movement of the fire engine of about 50 km/h, the waiting time for the arrival of firefighters is approximately: The time of 18 minutes to start the intervention is considered favourable and provides effective protection in the event of a fire of higher intensity.
- From the aspect of fire protection, the facilities are designed as separate facilities and as facilities in a row. Separate facilities are designed to be located at a distance from other facilities in the complex at a minimum of 4m, which prevents the transfer of fire from one facility to another. In facilities designed as buildings in a row, measures to prevent fire transmission, such as separation distances on the facade and roof, are provided.
- Requirements for safe installation in Terms of fire and explosion protection measures with a certified Site plan were obtained, Ministry of the Interior, Emergency Situations Sector, Emergency Situations Department in Bor, No. 217-8865/23 of 13/10/2023.
- The required fire resistance of roof structures of 30 min is achieved by fire-resistant coatings for steel. Only the main roof supports (IPE 450) are treated with fire-resistant coatings. The roof that serves as a fire separation has a fire resistance rating of 60 minutes in accordance with the standard SRPS EN 1365-2.
- The Fire Protection Study defines the essential elements for the protection of facilities against fire and explosions so that in the event of a fire:
    - preserve the load-bearing capacity of the structure of the subject facility for a certain period of time;
    - prevent the spread of fire and smoke within the subject facility;
    - prevent the spread of fire to adjacent facilities;
    - enable the safe and secure evacuation of people, i.e. their rescue.
- As a first condition of preventive action, it is necessary to exclude the possibility of finding ignition sources at critical points in the facility.
  To avoid a fire or explosion, it is necessary to remove at least one of the 3 listed conditions that lead to a fire, namely:
    - combustible material (usually flammable gases, liquids or solids…)
    - oxidizer (oxygen or air)
    - sources of ignition are direct causes of fire and can be classified into several groups: heated surface, open flames, sparks of mechanical origin and welding, malfunctions on live electroenergetic installations, atmospheric discharge, etc.

  If this condition is met a fire cannot occur.

Fire protection measures related to equipping facilities with security systems and devices have been developed based on the following:

1. Rulebook on Technical Norms for Fire Protection of Industrial Facilities ("Official Gazette of RS", No. 1/2018 and 81/2023)
2. Rulebook on Technical Norms for the Protection of Storages from Fire and Explosions ("Official Gazette of SFRY", No. 24/87)
3. Rulebook on Technical Norms for Fire Protection of Residential and Commercial Buildings and Public Facilities ("Official Gazette of RS", No. 22/2019)

4. Risk assessments based on the generally accepted EUROALARM method.

Based on the results of the fire risk assessment and the aforementioned regulations for the facilities, the following safety systems were adopted in project documentation:

I. The entire complex is to be protected by an external hydrant system

J. Facility W-C01 Reception guardhouse and administrative building

a. Internal hydrant system
b. Fire detection system
c. Ventilation of the evacuation staircase through a window in the facade

K. Facility W-C02 Operational Centre

a. Internal hydrant system
b. Fire detection system
c. Ventilation of the evacuation staircase through a window in the facade
d. Gas extinguishing of certain technical rooms

L. Facility W-C04 Pump station and fire station

a. Internal hydrant system
b. Fire detection system
c. Stable extinguishing system in the pumping station part

M. Facility W-C08 Pretreatment and Waste Storage

a. Internal hydrant system (in an area where persons can access)
b. Fire detection system
c. Methane detection system in the sludge bunker area
d. Stable extinguishing system
e. Natural smoke extraction system

N. Facility W-C11 Thermal Waste Treatment Plant

a. Internal hydrant system
b. Fire detection system
c. Stable extinguishing system in the zone around the burner
d. Natural smoke extraction system

O. Facility W-C12 Stabilization and Solidification

a. Internal hydrant system
b. Fire detection system (only in a space accessed by people)
c. Hydrogen detection system

P. Facility U-C02 Maintenance Building and Auxiliary Systems Facility

a. Internal hydrant system
b. Fire detection system
c. Natural smoke extraction system.

The project defines **the boundaries of fire sectors (SOPs)** in accordance with the adopted degree of resistance, i.e. the calculation of:

- The division of facilities into fire sectors was primarily based on regulations that require the fire separation of specialized rooms. This was done in accordance with the possibilities that allow the smooth operation of the technological process, the fire risk assessment, and the goal of ensuring the effective and safe evacuation of all occupants, while also preventing the spread of fire and smoke within the facilities.
- The construction measures envisaged to prevent the transfer of fire are the limitation of the filling of the waste bunker (max. up to 80% of the volume) to prevent the transfer of fire from one bunker to another or from the bunker to the conveyors transporting waste to the W-C11 facility. In case burning waste is transferred by crane on conveyors, local extinguishing systems on the conveyors are provided.
- The facilities are separated by a fire-resistant concrete wall for at least 120min and connected only by conveyor openings. Fire transmission over the roof is prevented by a fire-resistant roof covering in accordance with the adopted SOP on facility W-C08.
- The return of the flame from the boiler to the bunker is prevented by a technological solution that is an integral part of the boiler technology.
- Within the W-C08 facility, which, due to its primary purpose, was treated in accordance with the Rulebook on Technical Norms for the Protection of Storages from Fire and Explosions ("Official Gazette of the SFRY", No. 24/87), there is an area used for the pretreatment of hazardous and non-hazardous waste (such as shredding of waste). If the area serves other purposes, due to technological requirements, it could not be separated from the storage bunkers by fire protection measures. This room is connected to the bunkers only by conveyor openings, and in the rest, it is separated by a fire-resistant concrete wall for at least 120 minutes. Local fire extinguishing systems are envisaged as a measure to reduce the possibility of fire transmission on these conveyors.

- Resistance of structural elements in accordance with the Rulebook on Technical Norms for Fire Protection of Residential and Commercial Buildings and Public Facilities ("Official Gazette of RS", No. 22/2019) is defined for the following facilities:

  - **W-C01 Reception guardhouse and administrative building**

  In accordance with the adopted category of the facility (IP1) and the class of the facility (P2), the degree of fire resistance of the facility is II.

  - **W-C02 Operational Centre;**

  In accordance with the adopted category of the facility (NP2) and the class of the facility (P2), the degree of fire resistance of the facility is III.

  The operational centre is located in the immediate vicinity of the boiler plant (10m), so due to the possibility of transferring fire to the roof from a higher to a lower facility, the resistance of the roof covering was adopted in accordance with the adopted SOP III, which is 30min.

  - **W-C04 Pump station and fire station;**

  In accordance with the adopted category of the facility (NP2) and the class of the facility (P2), the degree of fire resistance of the facility is II.

  The requirement for the resistance of the facade wall exists and is met only in the zone of the pump station, namely fire resistance of 60 min. This requirement is derived from the standard for stable extinguishing systems SRPS EN 12845.
- The resistance of structural elements for the facility W-C08 Pretreatment and waste storage was carried out in accordance with the Rulebook on Technical Norms for Fire and Explosion Protection of Storages ("Official Gazette of SFRY", No. 24/87) In accordance with Article 4 of the Rulebook, the facility in question, based on its area, belongs to large storages with a high fire load.
- In accordance with the Rulebook on Technical Norms for Fire Protection of Industrial Facilities ("Official Gazette of RS", No. 1/2018 and 81/2023) defines the resistance of structural elements to facilities:
  - **W-C11 – Waste thermal treatment plant** - there is no requirement for fire resistance of structural elements of the facility

- **W-C12 – Stabilization and solidification –** Fire resistance of structural elements that support the building and the elements constituting the fire sector is required for at least 30 minutes. This includes construction elements whose failure could not lead to the collapse of the bearing structure or the fire sector's structure, as well as construction elements of the roof's bearing structure, whose failure might lead to the collapse of the remaining roof structure.
- **U-C02 – Maintenance building and auxiliary systems facility –** The required fire resistance of structural elements that support the building and the elements that define the fire sector must be at least 30 minutes, while there is no specific fire resistance requirement for other building elements.

Considering the need to preserve the process and the value of the equipment, it was determined that the elements at the boundary of the fire sector should have the following fire resistance: fire-resistant walls with a rating of 90 minutes, fire-resistant floors with a rating of 60 minutes, and fire-resistant doors with a rating of 30 minutes (or 60 minutes if the door surface exceeds 3.6 m²).

- For evacuation and rescue of persons and materials from the facility in case of fire, it is necessary to define and mark the evacuation routes in the facility in accordance with the Law on Fire Protection ("Official Gazette of RS", No. 111 of 29 December 2009, 20 of 24 February 2015, 87 of 13 November 2018, 87 of 13 November 2018 - others Laws) and applicable standards in this field.
- Evacuation routes and exits are designed to be marked as easily recognizable and visible. Marking of evacuation routes and exits is provided for by the prescribed signs placed in the most visible places.
- Identification of evacuation routes and exits must not be hindered by placed objects or decoration. Evacuation routes do not lead past fire-explosive and hazardous premises and substances.
- The floors of the evacuation routes are designed to be flat, without protrusions or damage that could cause people to fall, especially during evacuation. They are also non-slip and free from mats that could wrinkle or shift.
- Evacuation exits lead to free space - areas outside the facility, which is large enough to accommodate all evacuees.
- Traditional building materials that provide the required fire resistance will be used as the basic principle for the selection of materials for structures that should be fire resistant.
- The prevention of the horizontal spread of fire on the facade, i.e. the transfer of fire at the border of the fire sectors of the part of the project in question to the rest of the space in the zone of the outer wall, is also achieved by applying a horizontal breaking distance of not less than 1 m, whose fire resistance is equal to the fire resistance of the wall that is perpendicular to the facade.
- The facade (outer) wall is constructed in such a way as to prevent the path of flame between two adjacent floors by performing a vertical construction element whose fire resistance is in accordance with the adopted degree of fire resistance of the facility.
- Wall, ceiling and floor coverings installed on evacuation routes that do not belong to the evacuation corridor (e.g. floor corridors, passages, etc.) must be fire reaction characteristics according to the standard SRPS EN 13501-1.
- All structural elements and fire-resistant doors must be constructed of construction products with fire reaction characteristics according to SRPS EN 13501-1.
- Horizontal breaking distances at the boundaries of fire sectors must meet the requirements regarding the characteristics of reactions to fire, i.e. construction products must be applied according to the standard SRPS EN 13501-1.
- The walls of vertical ducts for accommodation of installations must be fire-resistant for 30 min for facilities with II and III degrees of resistance. The walls of vertical channels must be made of construction products with fire reaction characteristics according to the standard SRPS EN 13501-1.

- The category of technological process was established based on Article 11 of the Rulebook on Technical Norms for Hydrant Fire Extinguishing Network Installations ('Official Gazette of RS', No. 3/2018);
    - K2 - plants in which flammable liquids of category 3 are used, produced or processed, plants in which explosive dusts are generated by processing with a smouldering temperature of over 350°C or an ignition temperature of over 450°C, pumping plants for liquid substances whose flash point is between 60°C and 100°C, plants in which coal dust is generated, wood chips, flour, powdered sugar, synthetic rubber powder, etc., **large storages**, medium-sized storages for rubber products, facilities over 30 m high, facilities in which more than 500 persons reside, etc.
    - K4 - plants in which non-combustible substances are used, produced or processed, plants in which liquids with a flash point above 300°C are operated, solid substances with a flash point above 300°C and substances processed in a heated, softened or molten state, whereby heat is released accompanied by sparks and flames, melting, casting and metal processing plants, gas-generating plants, internal combustion engine testing departments, **boiler rooms**, **control buildings in power plants,** plants in which solid, liquid and gaseous fuel is burned, small garages, small storages, facilities in which 100 to 200 persons reside, facilities in which children, elderly persons, immobile patients, etc. and facilities up to 22 m high.
    - K5 - represents the category of the technological process of fire hazard, which includes plants that work with non-combustible materials and cold wet material, for example: plants for mechanical processing of metals, compressor stations, plants for the production of non-combustible gases, wet departments of the textile and paper industry, plants for the extraction and cold processing of minerals, asbestos and salts, facilities for the processing of fish, meat and dairy products, water stations and **facilities that can accommodate up to 100 persons**.

- For the facility W-C08 Pretreatment and storage of waste, according to the requirements given in the Rulebook on Technical Norms for the Protection of Storages from Fire and Explosion ("Official Gazette of the SFRY", No. 24/87), given the adopted size of the fire sector for the storage part of the facility, **the obligation to install a stable system for timely fire detection and alarm is prescribed.** For other facilities in the complex, the installation needs for automatic fire detection and alarm are adopted in accordance with the results of the risk assessment (Numerical documentation of the Fire Protection Study).
- The project documentation outlines the installation of **addressable central devices for fire detection, alarm, and fire extinguishing management**. The planned central devices are modern, modular, and redundant, with the capability to monitor and manage fire extinguishing systems across multiple sectors.
- The installation of the central device in the operational centre in the command room, in the part of the entrance hall of the administrative building with the guardhouse and in the technical room of the waste storage is planned. In addition to the aforementioned central devices of the fire detection and alarm system, the project documentation also envisages the installation of central devices at level +8.40 of the waste storage, which serves exclusively for the management of the Novec 1230 MCC gas extinguishing system of the room, as well as the installation of a central device in the operational centre at level +8.16 for the management of the MCC extinguishing system of the room of the operational centre.
- In addition to the previously mentioned facilities, the gas extinguishing system is managed from the DCS room in the operational centre. This system will be controlled via a fire alarm switchboard located in the control room, which not only handles fire detection and alarms but also manages the fire extinguishing system.
- In addition to the central device in the command room of the operating centre, the installation of software for graphic monitoring of the system is envisaged, which allows the user an unlimited number of graphic folders and management of all system functions. The software

aims to indicate to the user, through integrated graphic maps, the position of the elements where the alarm, shutdown error or any other protocol-defined event occurred.

- All central devices of the fire detection and alarm system will be connected via a single-mode optical cable to enable the entire fire alarm system to function as a unified entity.
- Depending on the purpose, possible causes of the outbreak, the first manifestations of the occurrence of fire, different types of detection were selected:
    - **Point detectors—optical addressable detectors** - are installed in rooms where smoke is expected as the first indication of fire. Additionally, in rooms where smoke, water vapour, or other vapours may be present during normal operations, combined fire detectors are planned. These combined detectors function as thermal detectors during the facility's operating hours and switch to smoke detection after hours.
    - **Flame detectors** - Due to the mode of fire manifestation, the installation of IR 3 flame detectors is planned in some facilities. This detector reduces false alarms and is widely used in industrial and commercial facilities. IR 3 also offers 3-4 times the distance of any conventional IR or UV/IR detector. The envisaged type of flame detector is intended for both indoor and outdoor installation.
    - **IC flame detectors** - Due to the manner of fire manifestation, the installation of IC temperature change detectors, i.e. hot parts of materials above 100ºC, is planned in the waste pretreatment and waste storage facility. The IC temperature change detector responds to the infrared part of the spectrum. The detected radiation is led through one filter to an optical-electric transducer that gives an electrical signal. In case of heavily soiled environment, it is also necessary to consider the option of blowing compressed air into the detector housing itself to clean the optical part.
    - **Digital thermo-sensitive cable** – In facilities where moisture and high humidity are present, the installation of a digital thermo-sensitive cable with a reaction temperature of 78 ºC will be envisaged. The thermo-sensitive cable is connected to the monitored input of the addressable module of the fire alarm system, or to the controller for the connection of the digital temperature-sensitive cable.
    - **Line smoke detectors** - If the mounting height is not suitable for installing optical (point) smoke detectors, the design includes the installation of linear fire detectors with a controller. The linear detector consists of a controller, receiver, and reflector.
    - **Aspiration Smoke Detector (Suction Smoke Detectors)** - Smoke detection in the initial phase of the fire is a very important factor that provides additional time that can be used to prevent damage in specific parts of the facility. The principle of operation of suction detectors is based on constant air sampling through sampling holes, after which the air is transported to a high-sensitivity laser smoke detector and analysed for the purpose of detecting smoke particles.
- In addition to the mentioned types of detection, the project documentation includes the installation of **manual fire alarm** call points in passageways, evacuation routes, and corridors. The purpose of the planned manual detectors is manual activation by the person who noticed the fire, and the automatic fire detectors have not yet been activated. In the case of requests for external installation of manual detectors, the project documentation will provide manual detectors in the appropriate degree of IP protection (according to the standard SRPS EN 60529:2011 Degrees of protection of electrical equipment achieved using protective enclosures (IP code) (identical to IEC 529:1989).
- The installation of **addressable input/output modules** is also envisaged to manage and accept/process data. Modules that are intended to activate executive functions from the fire detection and alarm system must be connected to the fire function loop.
- In all facilities and on all floors in the facilities, sirens or alarm sirens with a flash are provided in such a way that a minimum sound level of 65dB or 10dB above the noise level is provided.
- In the waste storage and pretreatment facility, the installation of alarm flashers is also planned, intended to signal the activation of the fire extinguishing system.
- In addition to its standard function of activating light-sound alarm devices, the siren alarm switchboard can activate or stop other processes relevant to the system's functionality, the

facility's operations, and the safety of personnel and equipment. Upon activation of the automatic fire detection and alarm system, the defined executive functions are as follows:

- Activation of the natural smoke and heat extraction system of the stairwell
- Lowering the elevator to the evacuation level
- Sending alarm signals via telephone alarm apparatus
- Activation of the natural smoke and heat extraction system
- Activation of the water curtain at the border of pretreatment of non-hazardous waste and the reception bunker for non-hazardous waste
- Extinguishing the shredder after detecting a fire on the shredder or in the waste bunker
- Stopping conveyor belts in case of fire on the shredder or in the waste bunker and waste pretreatment
- Extinguishing the hazardous waste shredder after the completion of the initiated process in the event of a fire in the waste bunker and waste pretreatment
- Activating the burner extinguishing
- Activating the transporter shutdown
- Activation of extinguishing - monitor
- Activating the crane protection

- In addition to the standard function of the system, which is the activation of light-sounding alarm devices, i.e. sirens, sirens with a flash and light warning panels, the fire extinguishing system control panel has the ability to activate or stop other processes relevant to the functionality of the system, the functionality of the facility and processes that would affect the safety of personnel and equipment in the facility. Blockage of Emergency Ventilation: Emergency ventilation systems are designed to remove combustion products and extinguishing agents from the room. To ensure that the extinguishing agent remains effective and continues to address any potential residual hot spots, the emergency ventilation is automatically blocked for a specified period after the fire is detected and the extinguishing system is activated. This blockage prevents the premature expulsion of the extinguishing agent before it has had sufficient time to act. The emergency ventilation blockage is automatically engaged by the central system upon receiving a fire signal and remains in effect for 30 minutes. After this period, it can be reactivated by pressing the red mushroom button located on the emergency ventilation cabinet.
- To mitigate or completely eliminate false alarms, the project envisages that the entire fire detection system has an integrated false alarm verification system that will, through complex algorithms and a series of predefined rules, enable users to eliminate the controlled occurrence of alarm triggers and reduce the number of false alarms to a minimum. The system for automatic detection, alarm and fire extinguishing management requires a detailed alarm plan in which procedures must be established during and outside working hours, i.e. in the case of the presence of employees and in the case when there is no one in the protected area. Directly adjacent to each central device, the following items must be placed:
  - Scheme of the alarm plan
  - Arrangement of fire detection and extinguishing zones
  - Operating instructions of the main fire extinguishing centre
  - System control notebook
- In addition to the alarm procedures related to the operation of the central fire detection, alarm, and fire extinguishing management system, the facility-wide alarm plan also includes procedures for:
  - Warning other persons that are present and evacuating them
  - Involving the persons on duty in extinguishing the fire
  - Alarming the nearest professional fire brigade
  - Alarming a person who has special duties in connection with fire protection.
- **Hydrogen sulfide ($H2_S$) detection** is planned in the areas with storage tanks, the liquid waste storage area 3, and the transfer stations for IBC containers/barrels, as well as in the sludge storage and dosing equipment area, and the hazardous waste pretreatment area, due to its highly toxic properties. Space for sludge storage and dosing equipment: When the concentration reaches 30 ppm, ventilation is activated at a lower speed, and an intermittent

alarm signal with a flashing siren is triggered. At a concentration of 50 ppm, ventilation increases to a higher speed, and a continuous alarm signal with a flashing siren is activated. Additionally, light warning panels displaying "GAS DO NOT ENTER" and "GAS LEAVE THE ROOM" are turned on.
IBC Storage and Barrels, and Rooms for Fuel and Non-Combustible Liquid Tanks: In these areas, ventilation operates continuously. If the concentration reaches 50 ppm, a continuous alarm siren with a flash will be activated, along with light warning panels displaying "GAS DO NOT ENTER" and "GAS LEAVE THE ROOM".
Hazardous Waste Pretreatment: At a concentration of 30 ppm, ventilation control/flap opening will be activated, and an intermittent alarm siren with a flash will sound. When the concentration reaches 50 ppm, a continuous alarm siren with a flash will be activated, along with light warning panels displaying "GAS DO NOT ENTER" and "GAS LEAVE THE ROOM."

- In the facility W-C08, a **methane ventilation and detection system (CH_4)** are installed in the area for sludge storage and dosing equipment. Given that the amount of methane emissions from the sludge is unknown, it is not possible to calculate the required number of air changes in the space to keep the methane level below the LEL (Lower Explosive Limit). Therefore, a methane detection system is installed in this area. The gas detector is mounted on the aspiration system pipe. For methane detection in the sludge bunker, an aspiration system designed for industrial environments and contaminated areas is used. The proposed methane detector (CH4) monitors the gas within the range of 0-100% LEL. At 10% of the LEL, the space will be inertized, that is, nitrogen will be injected and an intermittent tone will be activated via an alarm siren with a flasher. At 40% of the LEL, the power supply to the sludge bunker will be turned off and a continuous signal will be activated via an alarm siren with a flasher, as well as an alarm flasher will be activated via an alarm siren with a flasher and light warning panels displaying "GAS DO NOT ENTER", i.e. "GAS LEAVE THE ROOM". Executive functions are defined in the explosive gas detection project.
- Within the stabilization and solidification facility, a **hydrogen (H_2) detection system** is also planned, with alarm functions set at 10% and 25% of the Lower Explosive Limit (LEL). The facility will include the installation of a central unit for detecting explosive gases and vapours. Stationary fire detectors are to be installed at all locations where there is a potential risk of gas leakage, particularly in front of and around intake points of ventilation ducts, valves, joints, etc. All detectors will be equipped with appropriate Ex protection. Warning of the presence of an increased concentration of hydrogen will be carried out by sound signals via alarm sirens with flash distributed on the outside above the entrance door to the facility, as well as inside the facility. The installation of light panels marked "GAS DO NOT ENTER" is planned at the entrance to the room, while inside the room, above the door, light panels marked "GAS LEAVE THE ROOM" will be installed. These panels are activated when the methane concentration reaches 25% of the Lower Explosive Limit (LEL). The system's executive functions include: activating evacuation sirens with a flash via controlled outputs from the switchboard, activating the light panels marked "GAS DO NOT ENTER" and "GAS LEAVE THE ROOM," switching on ventilation at 10% of the LEL, and switching off the power supply at 25% of the LEL. The fire alarm system will receive a fault signal, a Threshold I alarm, and a Threshold II alarm.
- **An ammonia detection system (HN_3)** for monitoring the concentration of ammonia is provided within the facility where the ammonia water tank is located and near the SCR module in the thermal waste treatment plant.
  Since ammonia is lighter than air, an ammonia detector is installed below the roof of the bund wall where the storage tank is located. Additionally, detectors are provided near the transfer pumps situated next to the storage tank, as well as near joints, valves where there is a high likelihood of ammonia leakage. Furthermore, alarm warning panels with the inscription “GAS DO NOT ENTER” and an alarm siren with a flasher are provided on the bund wall panels to inform personnel about the detection of ammonia toxicity.
  In the vicinity of the SCR module located in the thermal waste treatment plant, the project documentation provides for ammonia detection above the skid with valves, since ammonia, as previously mentioned, is lighter than air. Additionally, alarm warning panels marked "GAS

LEAVE THE ROOM" and an alarm siren with a flasher are provided to notify personnel of toxic gas detection.

- **Carbon monoxide (CO)** detection is also envisaged in the garage area of fire trucks within the pump station and fire station. In emergency conditions, such as when many vehicles with internal combustion engines are operating or if there is a malfunction in the ventilation system, carbon monoxide concentrations may increase. The detection system is designed to identify carbon monoxide in the event of such incidents. When the central device receives this information, it processes the data and activates both visual and audible alarms if the gas concentration exceeds the preset alarm levels through the fire alarm control panel. If a concentration of 250 ppm of carbon monoxide is detected in the garage, the system will also trigger the executive function to open the garage door to allow for air exchange. In addition to the above, the project documentation also includes sending signals from the relay outputs of the central carbon monoxide detection device to the inputs of the designated addressable input/output module of the fire detection and alarm system. The signals to be forwarded from the carbon monoxide detection system to the fire alarm system include: Alarm I threshold (100 ppm), Alarm II threshold (250 ppm), and error signals.
- In accordance with the Rulebook on Technical Norms for the Hydrant Fire Extinguishing Network ("Official Gazette of RS", No. 3/2018) all facilities must be covered by an external and internal hydrant network. The amount of water in the installation of the external and internal hydrant fire extinguishing network of a facility to be protected is defined according to:
  - the degree of the facility structure resistance to fire;
  - the category of technological process according to the fire risk to which the facility is classified (K1 to K5 and K1E);
  - volume of the facility.
- Based on the calculated water requirements for each facility, the minimum required amount of water was established. This was used to determine the total amount of water needed for the hydrant network to operate for 120 minutes.
- The internal hydrant network must have a minimum water flow at the most unfavourable place in accordance with the following table:

Height of facility (m)	Up to 22*	From 22 to 40*	From 40 to 75*	Above 75
Water quantity [l/s]	5	7.5	10	12.5

- The above results in the number of internal and external hydrants for simultaneous operation for each facility as shown in the table below:

Facility designation	Facility name	Amount of water internal network [l/s] (number of hydrants)	Amount of water external network [l/s] (number of hydrants)	Water quantity [l/s]
W-C01	*W-C01 Reception guardhouse and administrative building*	5 (2)	15 (3)	20
W-C02	*Operational centre*	5 (2)	10 (2)	15
W-C04	*Pump station and fire station*	5 (2)	10 (2)	15
W-C08	*Pretreatment and waste storage*	5 (2)	25 (5)	30
W-C11	*Waste thermal treatment plant*	7.5 (3)	20 (4)	27.5
W-C12	*Stabilization and solidification*	5 (2)	15 (3)	20
U-C02	*Maintenance building and*	5 (2)	15 (3)	20

Facility designation	Facility name	Amount of water internal network [l/s] (number of hydrants)	Amount of water external network [l/s] (number of hydrants)	Water quantity [l/s]
	Auxiliary systems facility			

- The W-C08 facility is designed in such a way that the process is fully automated, and it is not provided with human access due to the layout of the bunker, except in the part where there are technical rooms, waste pretreatment rooms, liquid waste storage rooms. The layout of hydrants for this facility will be such that it is possible to distribute the envisaged amount of water to the internal and external hydrant network, but also to have enough external hydrants so that all the amount of water is used only for external hydrants.
- A facility that has limited human access is a W-C12 solidification facility. Non-combustible material is stored in this facility. The internal hydrant network will be provided in the part of the facility that people can access, while the part where people cannot physically access will remain uncovered. In all other facilities, the internal hydrant network will cover the entire surface of the facility.
- The lowest pressure on the fire extinguishing nozzle in the most unfavourable place must not be less than 2.5 bar.
- Above-ground hydrants are installed on the water supply network (pipelines of the external hydrant network). All overhead hydrants must comply with the standard SRPS EN 14384, which is proved by an appropriate document of compliance in accordance with a special regulation governing this area.
- In the immediate vicinity of the external hydrant intended for immediate fire extinguishing, there must be a cabinet with fire hoses of the required length, nozzles and other firefighting fittings (reducers, dividers, etc.).
- The distance of the external hydrant, intended for immediate extinguishing, from the wall of the facility to be protected is at least 5 m, and at most 80 m.
- The internal hydrant network must be constructed in such a way as to enable safe and efficient handling of internal hydrants, as well as their use for immediate fire extinguishing.
- Internal hydrants and associated equipment that comply with SRPS EN 671-2 are used for the internal hydrant network, which is proved by an appropriate document of compliance in accordance with a special regulation governing this area.
- Galvanized steel pipes with a minimum internal diameter of Ø52 mm must be used for the internal hydrant network.
- Pipelines of the internal hydrant network that are exposed to impacts (such as those caused by moving motor vehicles in garages, storage areas, etc.), freezing of water, and similar influences must be protected from the harmful effects of these factors.
- When using internal hydrants and related equipment according to SRPS EN 671-2, the spacing of wall hydrants is determined so that the entire area is covered by at least one water jet, considering a fire hose length of 15 meters or 20 meters and a jet length of 5 meters.
- Fire hydrant cabinets should be installed at a height of 1.50 meters from the floor to the hydrant valve and marked with a fire hydrant symbol, using the letter H. The cabinet should be equipped with a fire hose with a diameter of 52 mm and a nozzle with a diameter of 12 mm.
- The waste-to-energy plant is supplied with technological-hydrant water from the existing Elixir Prahovo complex, and from the newly designed pit housing the shut-off valve and water meter.
- The connection pipeline for the technological-hydrant water is DN200 PN10 with a pressure rating of up to 5 bars.
- The technological water also supplies the fire water reservoir (W-C03, with a capacity of 1200 m³), which is equipped with pumps of sufficient capacity to support all fire protection equipment (hydrants + fixed extinguishing systems). The reservoir is sized for two hours of autonomous

firefighting and does not impose a load on the complex's connection. A replenishment rate of 20 l/s is provided, which can fill the reservoir in less than the prescribed 36 hours.

- The required water flow will be ensured by the simultaneous operation of 5 external fire hydrants with a diameter of DN80 mm, each with a capacity of 5 l/s, and 2 internal fire hydrants with a diameter of DN50 mm, each with a capacity of 2.5 l/s, resulting in a total flow rate of: Qf = 5 x 5 + 2 x 2.5 = 30 l/s, in accordance with the Rulebook on Technical Norms for Hydrant Fire Extinguishing Network Installations ("Official Gazette of RS", No. 3/2018).
- A sufficient number of external, above-ground fire hydrants with a diameter of DN80 mm, a capacity of 5.0 l/s, a height of H = 1900 mm, and a breakable column, are designed for the external fire protection technological-hydrant ring network. This setup ensures efficient and reliable fire extinguishing in the event of a fire occurring in any part of the facility or location.
- For the internal hydrant network needs, the facilities will be supplied from the external hydrant network of the complex.
- In accordance with the applicable fire safety regulations and considering the purpose and size of the facility, the installation of an internal fire protection network is planned, with the capacity to simultaneously operate two internal hydrants (2x2.5 l/s). Additionally, an external ring hydrant network is planned, with the capacity to simultaneously operate five external hydrants (5x5.0 l/s), resulting in a total capacity of 30.0 l/s.
- After the 1200 m³ fire water reservoir, of which 216 m³ is allocated for the hydrant network, and the pressure-boosting unit (Q = 30 l/s, H = 50 m, N = (2 operational + 1 standby) x 15 kW) with a 1500 l hydro-pneumatic tank, located in the pump station, the hydrant water for the entire location is distributed through a ring-type network with above-ground DN80 hydrants at the specified distance. A DN65 connection is branched off from the ring for the internal hydrant network of the facilities.
- An internal hydrant network with a capacity of 5 l/s (2x2.5 l/s) has been installed in the facility, with a minimum pressure of 2.5 bar at the last hydrant connection.
- Fire hydrants with a diameter of DN50 are located in wall-mounted tin cabinets (marked 'H'), positioned in visible, easily accessible, and impact-resistant locations. The hydrants are installed at a height of 1.5 meters from the floor.
- In the facility W-08, hydrants are installed only on the ground floor of the facility with a hose length of 20 m.
- In accordance with the applicable regulations, the requirement for a stable fire extinguishing system applies only to the W-C08 facility for waste pretreatment and storage. This requirement is outlined in the Rulebook on Technical Norms for Fire and Explosion Protection of Storages ("Official Gazette of the SFRY", No. 24/87).
  Due to the specific technology and geometry of the space, the facility cannot be divided into fire sectors with areas compliant with the requirements of Article 19. Therefore, automatic fire detection and extinguishing systems are provided within the facility to avoid limitations on the size of fire sectors. For other facilities, the need for a stable extinguishing system is defined based on the fire risk of the facility.
- A stable fire extinguishing installation will consist of the following systems:
  - Stable water/foam fire extinguishing system and
  - Steady gas fire extinguishing system Novec 1230.

- The primary standards used for designing the system and calculating the required amount of water are SRPS EN 12845 "Fire Extinguishing Installations - Automatic Sprinkler Systems - Design, Installation, and Maintenance" and SRPS CEN/TS 14816 "Fire Extinguishing Installations – Water Spray Systems – Design, Installation, and Maintenance".
- For the purposes of the foam fire extinguishing system, the standard SRPS EN 13565-2 "Fire extinguishing installations – Foam extinguishing systems – Part 2: Design, execution and maintenance was used.
- In cases where certain hazard classifications are not addressed by the aforementioned standards, guidelines from VdS and NFPA standards were used. VdS standards 4001, 2108, and 2109 were also utilized as supplementary standards (support) for design, as they are

considered the “most similar” to SRPS EN 12845, SRPS CEN/TS 14816, and SRPS EN 13565-2.

- The stable water/foam fire extinguishing system is divided into 10 extinguishing zones, with each zone being controlled by one alarm control valve (except for extinguishing zone 3.2, which is controlled by a solenoid valve supplied from extinguishing zone 3). The project includes the following extinguishing zones:
    - **EXTINGUISHING ZONE 1** - W-C04 FIRE STATION AND PUMP STATION
      Two identical sprinkler pumps (working and spare) are provided for diesel-powered fire extinguishing and one electric "jockey" pump for maintaining pressure in the system. During the operation of the diesel pumps, adequate ventilation of the pumping station is provided, in order to supply the air necessary for the combustion of the diesel engine.
    - **EXTINGUISHING ZONE 2** - W-C08 PRETREATMENT and WASTE STORAGE
      Receiving hoppers for non-hazardous waste, receiving hopper for hazardous waste, mix hopper, hopper for non-hazardous waste, hoppers for hazardous waste and hopper of prepared waste
      A total of 4 monitors are provided for the protection of waste storage bunkers, 2 of which are in operation while the remaining two are spare.
    - **EXTINGUISHING ZONE 3** - W-C08 PRETREATMENT and WASTE STORAGE
      PRETREATMENT OF non-hazardous waste

  In the pretreatment of non-hazardous waste, a wet sprinkler system is provided to protect the space itself. The pipe mesh with nozzles is filled with water and installed under the roof. Activation of this system is automatic due to rupture of the nozzle ampoule at elevated temperature.
  The shredders themselves have their own local spark extinguishing and immersion systems that are part of the system's operation technology itself and are not covered by this project.
    - **EXTINGUISHING ZONE 3.2 - W-C08 PRETREATMENT AND WASTE STORAGE**

      As an additional level of protection, i.e. reducing the possibility of transferring fire from one place to another, a local system for the protection of this opening for the insertion of shredded waste into the reception bunker for non-hazardous waste is envisaged.
      Activation of the extinguishing zone 3.2 is automatic. Activation of this system is a combination of automatic due to the rupture of the ampoule on the nozzle at elevated temperature, automatic and manual activation depending on the operator's decision. Activation of manual activation is also possible and depends on the operator's decision.
    - **EXTINGUISHING ZONE 4** - W-C08 PRETREATMENT AND WASTE STORAGE
      Crane track axis E and SHUTDOWN ZONE 4.1 - W-C08 PRETREATMENT AND WASTE STORAGE Crane track axis A
      In order to protect the horizontal steel structure for the crane, a drainage system with spray nozzles is provided. Activation of this system is a combination of automatic and manual activation and depends on the operator's decision.
    - **EXTINGUISHING ZONE 5 and ZONE 6 - W-C08 PRETREATMENT and WASTE STORAGE Movable floors**
      In order to protect the moving floors towards the W-C11 facility, a drainage system with spray nozzles is provided. The activation of this system is a combination of automatic and manual activation and depends on the operator's decision.
    - **EXTINGUISHING ZONE 7 and EXTINGUISHING ZONE 8** -W-C11 THERMAL WASTE TREATMENT PLANT BURNERS
      Two drain check valves with spray nozzles are provided for the protection of the area around burners 1 and 2 (extinguishing zones 7 and 8). The activation of this system is a combination of automatic and manual activation and depends on the operator's decision.

- Hydrants and hydrant equipment must be regularly inspected, kept in a clean and tidy condition and kept in the necessary book of records, which must be made available at the request of the competent inspection authority:

- pressure and flow measurement: every 6 months,
- inspection of all devices and fittings: at least once a year.

- At the request of the investor, the server rooms and electrical rooms where equipment of high value and importance for the preservation of the technological process is located will be protected by a stable gas extinguishing system NOVEC 1230, as follows:
  - **W-C08 Pretreatment and waste storage**
    - MCC of all rooms
  - **W-C02 Operations Centre;**
    - MCC of all rooms
    - DCS of all rooms

- The extinguishing agent is gas FK-5-1-12 which is commercially named NovecTM 1230. The system is designed in accordance with the standards SRPS EN 15004-1, SRPS EN 15004-2 and the manual for design, installation, operation and maintenance of the equipment manufacturer Kidde Engineered Fire Suppression System.
- NovecTM 1230 gas fire extinguishing systems are designed as "total flooding system" systems that fill the entire volume of the said rooms and to retain the appropriate gas concentration for the selected time.
- The activation of the system is carried out automatically, through the fire alarm and fire extinguishing control system. In the event that the automatic fire alarm fails completely, there is also a manual mechanical actuator on the pilot bottle with which the system can be activated.
- The person who performs manual activation must first check whether the entire staff has left the protected area because during manual activation there is no so-called tensile time, but the gas is immediately discharged into the protected area.
- All equipment used must be designed and tested to operate in a temperature range of -20°C to 55°C. Upon completion of the extinguishing, the cracked gas must remain in the protected area for a minimum of 10 minutes. After that, the space will be ventilated for 60 minutes.
- The selection of mobile fire extinguishing equipment was made on the basis of the classes of fires that may occur in the facilities in question.
- Mobile equipment consisting of portable handheld appliances with dry powder, marked "S" with a capacity of 9 kg and "CO_2" with a capacity of 5 kg is intended for extinguishing initial fires.
- The number of fire extinguishers is determined on the basis of the fire load on the surface of the area of the facility to be protected. In accordance with the geometry of the facility and respecting the rule that the user must not be more than 20 m away from the fire extinguisher, 15 fire extinguishers are adopted in the facility in question.
- Place the initial fire extinguishers in a visible and accessible place. In the case of hand-held appliances, place them at a height of not more than 1.5 m.
- Fire extinguishers should be regularly maintained, cleaned of dust and dirt. The correctness control should be performed every 6 months, and specialized services should be hired for the control. It is recommended to introduce records of cartons on performed tests, replacement of filling or replacement of parts.
- Despite the fact that the apparatus contains instructions for use and its use, it is necessary for persons working in the facility to educate and perform demonstration exercises, in order to be able to use the apparatus properly and efficiently and extinguish the initial fire at the critical moment, because the efficiency of the use of the apparatus largely depends on the education of employees. Therefore, it is necessary to familiarize all persons with the most necessary facts about fire and fire-fighting technique and to hold extinguishing drills from time to time, and also to make a plan and program of fire-fighting actions.
- For better visibility and visibility, operating boards for initial fire extinguishers can be placed next to the extinguisher or in fire hazard areas.

In accordance with the requirements of Article 71a of the Regulations on technical standards for fire and explosion safety of establishments and facilities for flammable and combustible liquids and on storage and flow of flammable and combustible liquids („Official Gazette of the Republic of Serbia “, nos.

114/2017 and 85/2021) the above-ground tanks for the storage of liquid waste are located in a building W-C08 that meets the following requirements:

- It is separated from other rooms by horizontal and vertical partitions reinforced with concrete and fire resistance doors for 120 minutes;
- Considering the position of the room in the facility, safe relief due to the occurrence of an explosion is provided on the facade wall;
- Forced ventilation with at least five air changes per hour is provided in the room;
- The windows and doors of the room open to the outside;
- The floor is made of non-combustible impermeable material.
- The tanks will be located in a concrete waterproof bund wall. Leaked contents from the bund wall will be collected in the collection pit from where they will be returned to the tanks by the pump.
- The room contains two tanks of 24m3 each, which is a total of 48m3, and at the same time the maximum allowable amount of combustible liquids in one room is intended to accommodate the tank.
- In accordance with Article 8, an above-ground tank, i.e. a construction facility for the accommodation of above-ground tanks must be provided with at least one access road for firefighting vehicles at a distance from which a safe firefighting intervention is possible, built in accordance with the regulation governing this area.
- Connection of vehicles to hydrants must be provided on the access road for firefighting vehicles.
- At 21 m from the facade wall of the room where the tanks are located, there is a fire truck access road.
- In accordance with Article 71b of the Rulebook, the following distances are provided:

Distance from	Required distance [m]	Achieved distance for the first tank group [m]
Public road and boundaries of the plot that does not belong to the plant.	7.5	> 65.5
Facility that does not belong to the plant referred to in Article 3, paragraph 1, item 5, and which are located on the plot that belongs to the plant.	7.5	31.6

- According to Article 29 of the aforementioned Rulebook, the distance between two tanks, regardless of the structure of the tank, must not be less than 1/3 of the sum of their diameters.
- The diameters of the tank are 3m, so based on that the minimum required distance between the tanks is 2m.
- A stable explosive gas detection system must be installed in the rooms for the accommodation of above-ground tanks.
- The room for the accommodation of above-ground tanks must be protected by a hydrant network with at least two standard hydrants.
- The above-ground tank with combustible liquids must be protected by at least two mobile fire extinguishing devices with a capacity of filling 9kg of powder or other appropriate means, and several above-ground tanks must be protected by two such devices for every two tanks. In the present case, this would mean that two mobile fire extinguishing devices should be installed in the liquid waste storage room.
- In accordance with Article 74, for access to the tanks, free space must be provided in all directions around the tank at least 1m.
- 114/2017 and 85/2021);
- For combustible liquids stored in the room, which is separated from the rest of the building by fire-resistant walls for 120 minutes, the allowable amount of a group of containers is 48,000 liters.
- The containers in the subject facility are stored in three groups so that Group 1 has a quantity of 8,000 liters, while Group 2 and 3 have quantities of 20,000 liters each.
- In all groups, the containers are stored in two levels up to a height of 2.7 m.
- Only undamaged and properly packed containers can be stored in a closed room.

- The containers are stored in a group, so that the nearest container must not be less than 1m away from the load-bearing beams of the facility, steel ropes, supports and from water spraying systems or other extinguishing systems.
- The mutual distance of the group of containers must be at least 1m horizontally and vertically so as not to jeopardize the strength and stability of the containers.
- The rest of the room is intended for the storage of non-reusable waste in accordance with technological requirements. All storage vessels are in accordance with the law and by-laws governing this area.
- The maximum allowable storage height of combustible liquid containers can be a maximum of 4.5m.
- The storage of these containers is provided for on the ground floor of the facility in accordance with the requirement referred to in Article 96 of the Rulebook on Technical Standards for Fire and Explosion Safety of Existing Facilities and Facilities for Flammable and Combustible Liquids and on the Storage and Transfer of Flammable and Combustible Liquids ("Official Gazette of RS", No. 114/2017 and 85/2021), while the distance of the room or building in accordance with Article 97 of the Rulebook:

Distance from	Required distance [m]	Achieved distance for the first tank group [m]
Public road and boundaries of the plot that does not belong to the plant	7.5	>105.5
Facility that does not belong to the plant referred to in Article 3, paragraph 1, item 5, and which are located on the plot that belongs to the plant	7.5	>7.5
Other facilities using flammable and combustible liquids and flammable gases	7.5	10.2

- In accordance with the requirements of Article 98 of the aforementioned Rulebook, the vessels are placed in a room within the construction facility that meets the following requirements:
  - It is separated from other rooms by horizontal and vertical partitions made of solid construction material and a fire resistance door of 120min;
  - The roof of the room is made of lightweight material (maximum mass per unit area of 150 kg/m2), which ensures safe relief due to explosion;
  - Forced ventilation with at least five air changes per hour is provided in the room;
  - The windows and doors of the room open to the outside;

- All containers of hazardous materials that have the potential to damage and leak liquid hazardous materials will be stored in appropriate standard portable tanks. The floor of the room is impermeable from the joining of the floor and the wall to a height corresponding to the lowest point of entry. It is designed from non-welding material with a slope from the entrance door to the opposite wall, along which there is a channel with a slope of 2% in the direction of the collection point of spilled liquids.
- The transfer of flammable and combustible liquids from one vessel to another or from tanks to tanks in a technological process in a closed room in a building or in the open, as well as from one auto-tank to an above-ground or underground tank in places where only one auto-tank is provided with access, is carried out by means of a pump at a designated and equipped flow point.
- The place of transferring must comply with the requirements of Article 115a of the Regulations on technical standards for fire and explosion safety of establishments and facilities for flammable and combustible liquids and on the storage and discharge of flammable and combustible liquids („Official Gazette of the Republic of Serbia “, No. 114/2017 and 85/2021) in terms of location and safe placement.
- As an exception to the requirement in Article 115a, the place of discharge must be at least 7,5m away from the public road, the border of the adjacent land and the facility that does not belong to the plant referred to in Article 3, paragraph 1, item 5, and are located on a plot belonging to the plant.

Distance from	Required distance [m]	Achieved distance [m]
Public road and boundaries of adjacent land	7.5	>78.2
Facility that does not belong to the plant referred to in Article 3, paragraph 1, item 5, and which are located on the plot that belongs to the plant oja pripada postrojenju	7.5	>7.5
	7.5	10.2
The nearest wall of the building intended for storage of vessels	7.5	10.2
Other facilities using flammable and combustible liquids and flammable gases	7.5	10.2
Public railway track for electric and other traction	20	>20m

- In accordance with Article 117 about technical standards for the fire and explosion safety of establishments and facilities for flammable and combustible liquids and for the storage and flow of flammable and combustible liquids („Official Gazette of the Republic of Serbia “, No. 114/2017 and 85/2021) the parts of the hatchery serving to connect the transport tanks shall be above ground.
- In accordance with Article 118 for the access of transport tanks to the connection point at the transfer point for the transfer of flammable and combustible liquids, there must be an access road that is an integral part of the transfer point. The length of the access road must be without slope and twice the total length of the connected tanks. The part of the access road, which corresponds to the length of the connected transport tanks increased by at least 12m on both sides of the transferring device, must not be in a curve.
- The part of the access road must be concreted, visibly marked and dimensioned according to the planned traffic, and the movement of the vehicle must be in one direction, all in accordance with the requirement of Article 119 („Official Gazette of the Republic of Serbia”, No. 86/2015).
- According to Article 118, for the access of transport tanks to the connection point at the transfer point for the transfer of flammable and combustible liquids, there must be an access road that is an integral part of the transfer point. The length of the access road must be without slope and twice the total length of the connected tanks. The part of the access road, which corresponds to the length of the connected transport tanks increased by at least 12m on both sides of the transferring device, must not be in a curve.
- The part of the access road must be concreted, visibly marked and dimensioned according to the planned traffic, and the movement of the vehicle must be in one direction, all in accordance with the requirement of Article 119.
- According to the requirement referred to in Article 121, spilled liquids may be discharged only into the technological sewer, and their acceptance can be ensured by special vessels from which the spilled liquid is discharged into the designated area.
- The pump and its equipment must be constructed and approved for transferring flammable and combustible liquids.
- In accordance with Article 136, the transferring point must be protected from heat sources by a hydrant network and mobile fire extinguishers in accordance with Article 135.
- The hydrant network of the transfer point consists of at least two hydrants, whereby the total number of hydrants is determined so that the distance between the two hydrants cannot exceed 50m. A cabinet with two 50m hoses, equipped with nozzles, must be installed next to each hydrant.
- The total number of mobile fire extinguishers according to the manufacturer's instructions, the filling capacity of 9kg of powder or other suitable means depends on the surface to be protected and they must be placed so that the distance between the two mobile devices does not exceed 10m.
- During transferring, there must be at least one other mobile fire extinguishing device with a filling capacity of at least 50 kg of powder or other appropriate means of destruction next to the transport tank.

- The installation of the pipeline route must be envisaged in accordance with the Rulebook on the conditions for uninterrupted and safe distribution of natural gas by gas pipelines with a pressure of up to 16 bar ("Official Gazette of the Republic of Serbia No. 86/2015
- When selecting the route, designing and constructing the gas pipeline, safe and reliable operation of the distribution gas pipeline must be ensured, as well as the protection of people and property, i.e. the possibility of harmful environmental impacts on the gas pipeline and the gas pipeline on the environment must be prevented.
- Within the complex, the route of the overhead gas pipeline is planned, which will be led by pipe bridges from the entrance to the consumer.
- In accordance with Article 7 on conditions for uninterrupted and safe distribution of natural gas by gas pipelines with a pressure of up to 16 bar ("Official Gazette of the Republic of Serbia No. 86/2015), it is necessary to ensure adequate distances of the gas pipeline from other installations. The minimum horizontal allowable distances of overhead gas pipelines to overhead power lines and telecommunication lines are:

Installation	**Minimum distances (m)**
Overhead power lines 1 **kV ≥ U**	**Post height + 3 m***
1 kV ≥ U	
1 kV < U ≤ 110 kV	**Post height + 3 m**
110 kV < U ≤ 220 kV	**Post height + 3.75 m**
400 kV < U	**Post height + 5 m**
Telecommunication lines	**2.5**

*** but not less than 10 m. This distance can be reduced to 2.5 m for lines with self-supporting cable harness.**

- In accordance with Article 8, the minimum height of installation of overhead gas pipelines from the elevation of the terrain are:

	Minimum height (m)	**Achieved**
In the passages of the people	2.2	≥2.2
In places where there is no transport and no passage of people	0.5	≥0.5

- In accordance with Article 9, it is necessary to provide for vertical light distances between overhead gas pipelines and other pipelines:
  - at the nominal diameter of the gas pipeline up to DN300 - not less than the diameter of the gas pipeline, but at least 150 mm;
  - at the nominal diameter of the DN300 gas pipeline and higher - minimum 300 mm
- Intersection of the overhead gas pipeline with overhead power lines is allowed only if these are constructed as self- supporting cable harnesses.
- When intersecting overhead gas pipelines with overhead power lines, the power lines must pass above the gas pipeline, with a protective network placed above the gas pipeline, and the gas pipeline must be grounded.
- The minimum horizontal distances of the outer edge of overhead gas pipelines from other facilities or facilities parallel to the gas pipeline shall be in accordance with Article 10, as follows:

Buildings and structures in the industrial complex	Distance Required (m)	Achieved distance (m)
From gas pipelines to sources of danger of plants and facilities for the storage of flammable and combustible liquids and flammable gases	15	>15
From gas pipelines to other industrial facilities classified in the first and second fire hazard categories in accordance with a special regulation	10	>10
Roads within the factory or company	1	>1
Pipeline pillar foundation to underground installations	1	>1
Substation in the building	5	12.9

- In the complex in question, the only facility in which a larger number of people is expected is the Operational Centre, which is 16.3 m away from the control station, which is more than the required 5m according to Article 11 in the Regulations:

Facility	Distance Required (m)	Achieved distance (m)
Railway	10	> 10
Pavement of city roads	3	>3
Local road	3	>3
State road, except highway	8	> 8%
The highway	15	>15
Internal roads	3	4.8
Source of danger of the petrol station for road transport, smaller vessels	10	None
Hazard source of plants and facilities for the storage of flammable and combustible liquids and flammable gases	10	13.1
Transformer station	10	15.3
Overhead power lines		
1 kV ≥ U	Post height + 3 m*	
1 kV < U ≤ 110 kV	Post height + 3 m*	
110 kV < U ≤ 220 kV	Post height + 3.75 m	
400 kV < U	Post height + 5 m	

- In the event of a power outage, a backup power source, a diesel electric generator (DEA) with complete equipment necessary for automatic operation, is provided for the supply of certain consumers in the facilities. For the power supply of all general electrical consumers, from a backup power source, the main distribution cabinet GROA-OP is planned, which will be located in the electrical room with a low-voltage plant.
- It is envisaged that safety systems operating in case of fire are powered through DEA and diesel pumps with their own tank. Diesel pumps are provided in the pumping station of the fire extinguishing system.
- In accordance with the Regultions on Technical Norms for Fire Protection of Industrial Facilities ("Official Gazette of RS", No. 1/2018 and 81/2023) on the facilities, the areas needed to compensate for fresh air are also provided, which must be of the same surface area as the smoke and heat extraction openings.
- Smoke extraction of the facility W-C11 – Waste thermal treatment plant is carried out using 10 roof domes, each measuring 2,100 x 1,800 mm. The total area to smoke is >3% of the building area. Air compensation is via external rain protection blinds explained within the ventilation of the facility.
- It is necessary to provide openings for the supply of fresh air of at least the same surface in the lower half of the height of the facade.

- The total area of smoke and heat extraction openings in the facility U-C02 – Maintenance building and auxiliary systems facility is ~ 45m2. It is necessary to provide openings for the supply of fresh air of at least the same surface in the lower half of the height of the facade.
- In the facility W-C08, where, due to the type of raw material to be stored, a large smoke is expected in the event of a fire, the design envisages a system for natural smoke and heat removal through roof domes that will be opened on fire alarm. Therefore, the smoke extraction of the facility was solved using roof domes in the zone of the waste unloading room and service reception of the rake with 2% of the surface area and for the higher part of the facility with 3% of the base area. Replacement of air is carried out through the front door (roll door) of the waste unloading rooms and service reception of the rake and pretreatment of non-hazardous and hazardous waste
- Natural smoke and heat extraction switchboards should be connected via addressable modules to the fire alarm centre for the purpose of exchanging information, as well as activating executive functions from the smoke extraction switchboards. Manual activation of the smoke extraction switchboards is done through manual detectors of orange colour.
- Addressable modules must be installed on a special fire alarm loop that will be equipped with a fire function.
- An air conditioning chamber on the roof of the building W-C01 Reception guardhouse and administrative building are planned to ventilate the space and prevent the penetration of outside air into the rooms (all rooms are under mild overpressure).
- A PP flap is provided on the wall of the laboratory room, where the duct enters the room. In addition to the FP flap, a regulating blind is also provided, which is guided by the pressure difference in front and behind the room in order to prevent the penetration of contaminated air into the rest of the facility. Laboratories have their own local digesters.
- The laboratory sample warehouse has a local suction fan to maintain underpressure and minimal ventilation.
- Ventilation of transformer boxes is foreseen by forced ventilation in the facility W-C02 Operations Centre. Fan operation control is performed based on the thermostat in each room.
- The ventilation of the diesel generator is carried out using a fan integrated into the diesel generator (as part of the diesel generator project). The ventilation ducts are used to directly drain the exhaust air from the diesel generator cooler. There are rain blinds on the facade. The air supply is on the opposite side of the building, and the blinds are located in the front door of the diesel generator room.
- Ventilation of the MCC room is carried out by means of suction fans, which are located in the frequency regulator zone. The air supply is from the outer facade, and in the zone of the double floor. In order to seal the room in case of fire, a sealing flap with an electric drive with a quick response was installed before each rain blind. During the fire alarm, and before the activation of the fire extinguishing gas, all flaps are closed and the fans are extinguished. A pressure relief damper was also installed to reduce the pressure during fire extinguishing activation (the dimensions of the damper should be defined in the fire extinguishing design). After a successful shutdown, flaps open and ventilation is activated.
- The DCS room is ventilated using an aspiration fan. The ignition and extinguishing is done on the basis of a timer. The air supply is from the outer facade, on the opposite side in relation to the suction fan. In order to seal the room in case of fire, a sealing flap with an electric drive with a quick response was installed before each rain blind. During the fire alarm, and before the activation of the fire extinguishing gas, all flaps are closed and the fans are extinguished. A pressure relief damper was also installed to reduce the pressure during fire extinguishing activation (the dimensions of the damper should be defined in the fire extinguishing design). After a successful shutdown, flaps open and ventilation is activated.
- In the zone of the garage in the facility W-C04 Pumping station and fire station, an axial wall fan is provided, which is guided on the basis of the CO concentration in the space (on/off mode). Air compensation is a door roller at the entrance to the garage.
- Mechanical ventilation in the facility W-C08 Pretreatment and waste storage is provided for the following rooms:

  - Space for sludge storage and dosing equipment – with existing suction ventilation for the needs of the boiler 2,000 m^3/h. Air compensation is from the facade of the building
  - Oily and bilge water tank room – Axial wall fan for suction from a space with a floating blind with a capacity of 4,500 m^3/h. The air compensation is from the external roller shutter door from this room, as well as the waste unloading room and the service reception of the rake and the pretreatment of non-hazardous and hazardous waste
  - Pretreatment of hazardous waste – axial wall fan for suction from a space with a floating blind with a capacity of 3,500 m^3/h. Air compensation is from the facade of the building
  - IBC warehouse and barrels - axial wall fans (3 pieces) for suction from spaces with floating blinds with a total capacity of 17,000 m^3/h. Replacement of air is from the facade of the building – 4 rain blinds
  - Room for tanks of combustible and non-combustible liquid – 2 channels are provided with associated elements for inserting and sucking air from the space
  - Total amount of insertion/extraction is 2.500 m^3/h
  - The open part of the facility to the roof is ventilated by suction of 33,000 m^3/h using the system required for the operation of the boiler in W-C11. Air compensation is on the ground floor from the facade of the building using 2 ducts and 2 rain blinds.
- Therefore, the smoke extraction of the facility was solved using roof domes in the zone of the waste unloading room and service reception of the rake with 2% of the surface area and for the higher part of the facility with 3% of the base area. Replacement of air is carried out through the front door (roll door) of the waste unloading rooms and service reception of the rake and pretreatment of non-hazardous and hazardous waste
- In addition to the planned fans for the ventilation of the facility for the needs of the boiler plant, an additional 35,000 m^3/h is extracted from the space – constantly in operation (this part is not the subject of the thermomechanical design). So, the maximum ventilation that can be achieved is 335,000 m^3/h. Replacement of air is carried out through external rain blinds located in the lower zone of the building on the west facade. The dimension of one of the 29 grids is 2,000 x 1,155 mm, i.e. the effective area per grid is 1.0974m2, i.e. the total effective area of all grids is 31.8246m^2.
- The W-C11 facility is smoked using 10 roof domes, each measuring 2,100 x 1,800 mm. The total area to smoke is >3% of the building area. Air compensation is via external rain protection blinds explained within the ventilation of the facility.
- On the southwest facade of the building W-C12 Stabilization and solidification, 3 fans are provided in EX protection, which is switched on if the main ventilation system of the building W-C12 is stopped. The planned fans have a total capacity of 15,000 m^2/h, designed to avoid an increase in hydrogen concentration in any part of the facility. Replacement of air is carried out through 10 external rain blinds, each measuring 400 x 1,155 mm.
- The lightning protection installation of each facility consists of internal and external lightning protection installations (UGI and SGI) that are galvanically interconnected and form an effective protection against atmospheric discharges.
- For the protection of buildings from direct lightning strikes, a classic lightning protection installation is planned, formed in the form of a "Faraday cage".
- Visually inspect lightning protection installations at least once a year. Recommended periods of complete control and testing of the lightning protection installation depending on the level of protection, according to SRPS EN 62305-3:2011 are: every two years for the I level of protection; every four years if the II level of protection and every six years if the III or IV level of protection;
- The earthing conductor is intended as a foundation earthing conductor. The grounding is performed by placing a galvanized steel strip FeZn 25x4mm in the foundation of the facility.
- Grounding of metal masses in facilities: cable racks, electrical and TCS cabinet housings, hydrant network pipes, hydrants, machine channels, equipment stands, machine equipment, other metal structures, is carried out with the N2XH-J 1x16mm^2 conductor, which is laid from the equipotential bonding boxes or from the PE bus of the cabinet, along the cable routes, and the connection is made through cable lugs and screws with a gear washer.

In order to prevent and protect against explosions, it is necessary to ensure the application of organizational and technical measures for safe work in accordance with the nature of work and according to priorities, starting from the following principles:

- prevention of the occurrence of explosive atmospheres except when the nature of the work carried out so requires;
- avoidance of ignition of explosive atmospheres;
- mitigating the adverse effects of the explosion.

If necessary, these measures will be combined and/or supplemented with other measures whose application should prevent the spread of the explosion and revise them periodically, as well as in the event of significant changes that may affect the safety of employees. In places where there is a risk of potential explosions, the applied protection measures have achieved that this risk is very small.

It is the obligation of the Project Holder to:

- train employees for safe work;
- inform employees about all types of risks that may occur due to explosive atmospheres.
- to act according to the prepared Study on Hazardous Zones,
- ensure that work in the hazardous area is carried out in accordance with the instructions in writing,
- issues permit to work in high-risk workplaces, as well as in other workplaces where the performance of work may lead to risks due to explosive atmospheres and
- the work permit is issued by the responsible person, prior to the commencement of work

The primary protection measure is provided through design technical and technological solutions of equipment, installations and process parameters, as well as by placing the facility at an appropriate distance from other facilities. Secondary protection measures are provided by working regulations and the following solutions:

- U Grounding of pipelines, metal structures, equipment and construction locksmiths;
- Appropriate local ventilation of the equipment;
- Adequate general ventilation of the premises;
- The design ventilation system must meet the requirements of the Regulations on technical standards for ventilation or air conditioning systems (Official Gazette of the SR No. 38/89).
- Before starting work, the correctness and cleanliness of the device is checked;
- It is forbidden to use sparking tools;
- It is forbidden to introduce open flames into the Plant and
- Workers in the facility are required to wear appropriate clothing.

In order to ensure adequate preventive fire protection during the work process, the following should be undertaken:

- The design ventilation system must meet the requirements of the Regulations on technical standards for ventilation or air conditioning systems (Official Gazette of the SRJ br.38/89).
- Regularly check the functionality of all electrical devices and fire-fighting equipment.
- Inform visitors and staff about the behaviour at the plant in order to prevent fire outbreaks.
- It is important to detect the fire at the beginning and not allow its duration. All fire protection systems are based on its early detection and timely intervention with mobile and stable fire extinguishing equipment.

- Electrical devices are placed in zones of as low a degree of danger as possible or in a non-hazardous space if the technological and technical conditions of operation of the plant allow.
- If electrical appliances and installations are placed in areas endangered by explosive mixtures of flammable gases, vapours or mists, then they must meet the requirements for the area endangered by these mixtures.

- New electroenergetic installations and electrical installations to be reconstructed containing devices and installations that may cause the ignition of an explosive atmosphere must be supplied with the following information:
  - documentation on the basis of which the classification of the hazardous area was carried out (based on SRPS IEC 60079 – 10) with plans showing the classification and scope of hazardous areas including zoning
  - optional assessment of the consequences of ignition,
  - assembly and connection instructions,
  - documentation – data on conditions of use,
  - a document describing the system for the self-insurance system,
  - statement of the manufacturer / qualified person - applies in case the code is non-standard (except in case of a simple assembly in self-safety version or energy limited circuits),
  - necessary information to ensure the correct placement of the equipment to suit the personnel handling it,
  - information necessary for the inspection, for example the cleaning period,
  - information on the repair (replacement) carried out, whether the repair was carried out by the user or service technician,
  - temperature class or ignition temperature of the gas or vapor present,
  - external influence and ambient temperature.

- The basic principle of anti-explosive protection is to prevent the formation of a potentially explosive atmosphere, and when this is not feasible, to prevent the contact of the explosive atmosphere with ignition agents.
- For areas where there is a risk of explosion, the Rulebook on equipment and protective systems intended for use in potentially explosive atmospheres („Official Gazette of the Republic of Serbia", nos. 10/17 and 21/2020) and the Regulation on preventive measures for safe and healthy work due to the risk of explosive atmospheres („Official Gazette of the Republic of Serbia", nos. 101/12 and 12/13) shall apply.
- In order to prevent and protect against explosions, the Project Promoter is obliged to ensure the implementation of technical and/or organizational measures for safe and healthy work in accordance with the nature of the work performed, according to priorities, starting from the following principles:

  1. prevention of the occurrence of explosive atmospheres except when the nature of the work carried out so requires;
  2. avoidance of ignition of explosive atmospheres;
  3. mitigating the harmful effects of the explosion in order to ensure the safety and health at work of employees.

- Measures for safe and healthy work should, if necessary, be combined and/or supplemented with other measures whose application should prevent the spread of the explosion and should be revised periodically, as well as in the event of significant changes that may affect the safety and health of employees.
- The Project Holder is obliged, in accordance with the basic principles of risk assessment, starting from the principles of prevention, to ensure the application of preventive measures in order to ensure the safety and health at work of employees so that:

  1. Where explosive atmospheres may occur in quantities that may endanger the safety and health of employees or other persons, ensure working environment conditions in which work can be carried out in a safe manner;
  2. In a work environment where explosive atmospheres may occur in quantities that may endanger the safety and health of employees, use appropriate technical means, and in accordance with the risk assessment, ensure appropriate monitoring of the situation at all times while the employees are present.

- Safety labels, for areas where explosive atmospheres may occur, based on the Regulation on Preventive Measures for the Safety of Workers at Risk of Explosive Atmospheres ("Official Gazette of the Republic of Serbia ", br. 101/2012 i 12/2013) Exposed signs of a hazardous and healthy environment where explosive atmospheres may occur: shape – triangle; black pictogram on a yellow background; bordered in black; yellow occupies at least 50% of the surface of the mark.

SPACE WITH THE POSIBILITY OF EXPLOSIVE ATMOSPHERE OCCURRENCE

Hazardous areas must not contain substances and devices that can cause a fire or allow it to spread.

- In danger zones it is not allowed to:

  1. Holding and use of tools, devices, equipment and installations that are not intended for operation in danger zones, and may be the cause of fire, or explosion;
  2. Smoking and using open fire in any form;
  3. Disposal of flammable and other substances not intended for the technological process;
  4. Access to vehicles that can produce sparking during the operation of their drive device;
  5. Wearing clothing and footwear that may lead to the accumulation of static electricity and the use of devices and equipment that are not properly protected against static electricity.

- In danger zones, signs must be placed in visible places warning of the obligation and reading:
  - "NO SMOKING AND ACCESS TO OPEN FLAMES",
  - " ACCESS DENIED TO THE UNEMPLOYED",
  - “RISK OF FIRE AND EXPLOSION”
  - "MANDATORY USE OF NON-SPARKING TOOLS", etc.
- When performing works in danger zones, the user of the plant must take the prescribed safety measures.
- The execution of electroenergetic, non-electroenergetic installations and protective systems in danger zones shall be carried out in accordance with the regulations and standards governing fire and explosion safety in areas endangered by explosive atmospheres.
- Vehicles with an internal combustion engine may be used in areas endangered by explosive atmospheres only if they are equipped with protective devices on the engine exhaust systems.
- Provide employees with protective equipment and control the wearing of protective equipment.
- issues permit to work in high-risk workplaces, as well as in other workplaces where the performance of work may lead to risks due to explosive atmospheres and
- It is the obligation of the project holder and the equipment supplier that the installed equipment in the danger zones must have an appropriate domestic document of conformity of the Designated Conformity Assessment Body, as well as to comply with the applicable Serbian standards, according to the Decree on the manner of conducting conformity assessment and the Decree on the manner of recognition of foreign documents and signs of conformity („Official Gazette of the Republic of Serbia”, No. 98/2009);

- The management of all technological processes will be carried out through the DCS system through which the monitoring of all process parameters will be carried out, as well as the envisaged building management system (BMS) through which video surveillance, operation of ventilation systems (air conditioning) will be monitored.
- Liquid waste storage tanks will be located in reinforced concrete tanks of sufficient volume to receive the leaked liquid from one of the tanks (including the leak of the largest tank). All tanks are closed type and will be located within the facility for pretreatment and storage of waste
- Each tank will be equipped with the necessary instrument equipment, control valves, ON/off valves, pressure, temperature gauges, level gauges with remote indication on the DCS, high level switch as

overfill protection, which upon reaching the high level stops the pump for receiving from the car loading station.

- Nitrogen connections are provided on the dosing container, which enters the container if there is an increase in temperature in this device (nitrogen as an inert gas prevents the appearance of flames).
- K When the boiler plant does not work, nitrogen is automatically introduced into the sludge receiving hopper in order to interties the space.
- After inserting the waste into the chamber of the hazardous waste shredder, the door of the chamber closes automatically and at that moment nitrogen (N2) is introduced into the chamber of the stove, thus intertie the atmosphere in the chamber and preventing the emission of pollutants outside the shredder. Complete mechanical treatment equipment will be located in a closed facility intended for pretreatment and storage of waste.
- A double-walled reservoir to be housed in a concrete waterproof tank is provided for the storage of ammonia water (25% solution). During the summer months when the outside temperature is above 75 degrees Fahrenheit [25°C], it is necessary to cool the ammonia water storage tank. The reservoir is cooled by water from the water pool for recycling. There are 2 pumps (working and spare) for the tank armament.
- U In the W-C12 and W-C08 facility in the event of an explosion, in the bag filter, the inlet pipeline is provided for the installation of a mechanical PEK flap, which prevents the explosion from spreading to another part of the system. To protect the other side, the filter outlet, a chemical barrier is provided on the filter outlet channel, which prevents the penetration of the explosion to other equipment. On the bag filter itself there will be a service door and an anti-explosive panel (the destructive foils), which prevents an increase in pressure in the device in the event of an explosion, they are split, and the explosive flow is directed upwards by means of a repellent, thus preventing the endangerment of both people who are in the immediate vicinity, and other equipment;
- Maintenance and repair will be carried out according to a clearly defined dynamic, all in accordance with the applicable standards and regulations in this field and the instructions of the manufacturer/supplier of the equipment.
- Maintain green areas in good order. The grass must be mowed regularly and kept green by regular watering.
- Regularly keep streets clean and passable.
- All safety precautions are observed when maintaining premises and equipment.

8.2.2 Measures to respond to the accident and eliminate the consequences of the accident

- Accident response measures will be defined by the Safety Report and the Accident Protection Plan, to which the consent of the competent Ministry of Environmental Protection will be obtained within the legally prescribed period;
- In the event of a leak or spill of hydraulic and insulating oil, or small quantities of diesel, secure the spill site, pour the spilled quantity with a sufficient amount of absorbent, collect the contaminated absorbent and store it in appropriate containers until it is handed over to an authorized operator;
- If there has been a leakage of diesel outside the area where the diesel generator is located and environmental pollution that requires remediation or remediation of the area by specialized companies, inform the ministry responsible for environmental protection as soon as possible;
- Water from fire extinguishing within the waste warehouse will be collected in collection pools and transferred to one of the tanks by means of a pump from where it will be dosed to the boiler plant for thermal treatment.
- Within the facility W-C08 Pretreatment and waste storage, two basins are planned for the collection of wastewaters from fire extinguishing:
    - T.4 Fire extinguishing water basin 1 – designed to collect fire extinguishing water in waste bunkers

- T.5 Fire extinguishing water basin 2– is designed to collect fire extinguishing water in the premises where the waste and water pretreatment equipment is located from the drainage of the pipeline from the fire extinguishing system valve station.

- Pumps for emptying the water pool from fire extinguishing will be located in room T.3 Pumping station for water from fire extinguishing.
- If a fire occurs in the area where the waste is pre-treated, the contaminated water resulting from extinguishing, collect and drain the collection channels into the designed pool marked T.5 Fire extinguishing water pool 2.
- If there is a fire in the waste bunkers, take the contaminated water/foam resulting from the fire extinguishing, through the grate openings provided at the bottom of the bunker, to the collection pool T.4 Fire extinguishing water pool 1.
- Bearing in mind that these are wastewater that may be loaded with various pollutants whose treatment is not possible within the wastewater treatment plant in question, these waters should be pumped to the pumping station for water from fire extinguishing, pumped to the liquid waste storage from where they will be dosed to the boiler plant for thermal treatment.
- Due to possible complex activities during evacuation and extinguishing, upon arrival of the fire brigade on site, an operational headquarters should be formed, whose task is to connect and organize all tactical actions (rescue of endangered persons, fire extinguishing, uninterrupted water supply, delivery of necessary equipment, etc.);
- In the event of an accident at the facility in question, the project holder is obliged to immediately inform the ministry responsible for environmental protection, the local self-government unit (city) and the authorities responsible for handling emergency situations, in accordance with the regulations governing the said activity, about the circumstances related to the accident, the presence of hazardous substances, the available data for assessing the consequences of the accident on people and the environment and the emergency measures taken;
- In order to ensure timely and adequate response and make immediate decisions, which contributes to reducing the consequences or preventing the development of an emergency situation, define the method of notification of emergency events.
- It is the obligation of the project holder to develop a post-accident monitoring program after possible accident situations, which will contain planned activities for monitoring the state of the environment in terms of pollution by substances from the group of hazardous substances involved in the accident.

8.3 Environmental protection plans and technical solutions (recycling, treatment and disposal of waste materials, reclamation, remediation, etc.)

During the preparation of planning, project and technical documentation, certain legal acts in the field of environmental protection were also applied.

According to the Zoning Plan of the Municipality of Negotin („Official Gazette of the Municipality of Negotin“, No. 16/2011), the area in question is defined as an industrial zone or industrial-port centre of significant development potential.
The development of the chemical industry complex in Prahovo, which consists of "Elixir Prahovo - Chemical Products Industry LLC Prahovo" and "Phosphea Danube" LLC (hereinafter referred to as the Industrial Complex) is defined by the Second Amendments and Supplements to the Detailed Regulation Plan for the Chemical Industry Complex in Prahovo („Official Gazette of the Municipality of Negotin“, No. 17/2022), and by building an industrial park, a chemical park, an energy island, an ecological island, expanding the phosphorus gypsum warehouse, as well as providing a green buffer zone and displacing the routes of local roads outside the industrial complex, thereby ensuring the isolation of the impact of the industrial complex and the production process. The existing Industrial Complex occupies an area of about 148 ha, and there is a planned expansion in the east-west direction, so that the planned Industrial Complex occupies about 594.41 ha.

8.3.1 Environmental protection plans and technical solutions during the execution of works on the construction of the Waste-to-Energy Plant and Landfill for non-hazardous waste

- Before starting the execution of works, the Project Holder is obliged to obtain the appropriate technical documentation (PGD, PZI and the Main Fire Protection Design, etc.), provide its control and collect the necessary approvals in accordance with the Law on Planning and Construction ("Official Gazette of RS", No. 72/2009, 81/2009 - correction, 64/2010 - CC decision, 24/2011, 121/2012, 42/2013 - CC decision, 50/2013 - CC decision, 98/2013 - CC decision, 132/2014, 145/2014, 83/2018, 31/2019, 37/2019 - other law, 9/2020 and 52/2021 and 62/2023).
- Perform the works according to the technical documentation on the basis of which the Decision on the execution of works of the Ministry of Construction, Transport and Infrastructure was issued, i.e. according to the technical measures, regulations, norms and standards applicable to the construction of this type of facilities
- It is the obligation of the Project Holder to appoint an expert to supervise the execution of works, who will be the link between the contractor and the designer.
- Prior to the commencement of works on the installation, the Contractor is obliged to thoroughly study the design and clarify any ambiguities with the supervisory authority or the designer.
- The Contractor is obliged to prepare a study on the arrangement of the construction site, which, together with the report on the commencement of works, shall be submitted to the competent labor inspection.
- The Contractor is obliged to keep a construction log in which, in addition to the records of the performed works, he will record all changes, additional and subsequent works during that day. After the daily inspection, the Supervisory Authority shall certify the Contractor's statements with its signature.
- Only certified welders should be allowed to perform works on pipeline installations (SRPS – EN 287-1-2)
- Reinforcement works should be prepared in the workshop, and only installed on the facility
- Protect steel structures, supports and pipelines in contact with air, water and soil from corrosion with an appropriate protection system
- Spatially restrict the execution of construction and other works without removal or with the smallest possible removal of the cover protective layer due to the needs of site preparation and the construction of facilities, i.e. only with the necessary minimum penetration through the cover protective layer issued exclusively for the needs of (deep) foundation of piles in the aquifer environment;
- When clearing the terrain in the works area, all regulations on the protection and safety of work must be observed and any harmful impact on the environment and the immediate environment of the site must be prevented
- When performing earthworks, use data on the exact position of existing infrastructure facilities (underground electroenergetic cables, pipelines, etc.) in order to avoid damage to them.
- If, during the construction of the planned facilities, the presence of pollutants in the soil and groundwater, hazardous to their quality, is determined, it is mandatory to plan and carry out remediation and remediation of the soil/soil, in accordance with the Law on Environmental Protection ("Official Gazette of RS", No. 135/2004, 36/2009, 36/2009 - other law, 72/2009 - other law, 43/2011 - decision of the Constitutional Court, 14/2016, 76/2018, 95/2018 - other law and 95/2018 - other law), the Law on Land Protection ("Official Gazette of RS", No. 112/2015), Regulation on systematic monitoring of the state and quality of soil ("Official Gazette of RS", No. 88/2020), the Rulebook on the content of remediation and reclamation projects ("Official Gazette of RS", No. 35/2019) and other regulations in this field;
- Backfilling of the terrain (up to the planned elevation) and/or soil replacement should be carried out in accordance with the recommendations of previous and planned engineering-geological surveys, exclusively with material that does not endanger the quality of soil and groundwater.

- During construction, use materials that meet the prescribed standards or that are provided with a certificate issued by a professional organization registered for the activities of testing that material
- Use existing roads and roads as access to the construction site.
- The construction material, where the dusted shredded material is located, should be covered with foil/tarpaulin or sprinkled with sprayed water in order to reduce the possibility of raising dust due to wind.
- Organizational measures to prevent the scattering of construction materials during transport by covering the truck.
- In the event of high-speed wind and "critical" directions, the works should be temporarily suspended.
- In order to reduce emissions of pollutants into the air originating from machinery, do not leave running engines on vehicles and machinery when not in use.
- Work should be carried out in day mode. Observe the regulations related to the maximum allowable noise level in the environment.
- In the event of interruption of works for any reason, it is necessary to provide the facility and the environment.
- Work tools and accessories must always be clean and neatly stacked.
- After the completion of the works, repair the environment of the construction site in accordance with the design and according to the following:
  - all temporary traffic signalization, installed for the functioning of the construction site and traffic regulation, is completely removed after the completion of works and the original traffic regime is restored;
  - after the completion of works and individual phases of works, completely clean the construction site from all waste construction materials, temporary scaffolding, obstacles and protective fences and remaining construction tools, equipment and machines.
- If archaeological sites or archaeological objects are encountered during the execution of earthworks, the contractor is obliged to immediately, without delay, stop the works, take measures to prevent the finding from being destroyed and damaged, and to preserve it in the place and position in which it was discovered (Article 109 Of the Law on Cultural Property) and the competent institute for the protection of cultural monuments.
- The project holder is obliged to provide funds for research, protection, preservation, publication and display of goods that enjoy prior protection that is discovered during the construction of the investment facility - until the goods are handed over to an authorized protection institution (Art. Article 110 of the Law on Cultural Property).

8.3.2 Environmental protection plans and technical solutions during the regular operation of the Waste-to-Energy Plant

Thermal treatment of non-recyclable hazardous and non-hazardous waste must be carried out in accordance with the Regulation on technical and technological conditions for the design, construction, equipment and operation of facilities and types of waste for thermal treatment of waste, emission limit values and their monitoring ("Official Gazette of RS", No. 103/2023), and to that end, the Project Holder within Waste-to-Energy Plant will obtain the following:

- Waste thermal treatment shall provide and ensure conditions to prevent or limit negative impacts on the environment, in particular pollution by air, soil, surface and groundwater emissions, as well as possible risks to human health from waste thermal treatment, while meeting the technical conditions in accordance with the established emission limit values for incineration, or other conditions provided for in the project-technical documentation of waste management, in accordance with the permit, law and regulation.
- Measuring equipment will be installed, using a method for monitoring parameters, working conditions and mass concentrations that are important for the incineration process.
- Monitoring will be carried out by measuring under the conditions and in the manner determined by the permit.

- The installation and correct operation of automatic equipment for monitoring emissions into air and water are subject to annual control measurements in accordance with the certificate.
- Measuring devices used to measure emissions will be controlled and calibrated and tested in accordance with the regulation governing the emission of pollutants into the air (Regulation on the Measurement of Emissions of Pollutants into the Air from Stationary Pollution Sources "Official Gazette of RS", No. 5 /2016) in relation to the half-hour mean value at least once a year, and their calibration and testing are performed by laboratories accredited for calibration and testing, in accordance with the prescribed standard.
- Calibration and testing of measuring devices used to measure emissions will be performed through parallel measurements with reference methods at least every third year, that is, it will be repeated after each significant change (repair or modification of the gauge).
- The certificate of calibration and the report on the results of calibration and testing of the correctness of the device are prescribed to be submitted to the relevant authority for the authorization of professional measurement organizations within 60 days.
- The technical and technological conditions for the operation of the waste thermal treatment plant have been implemented and installed in the project technical documentation and will be carried out at the location in Prahovo so:
  - that the plant is designed and equipped, capable of operation and maintenance, so that it meets the requirements prescribed by the Regulation on technical and technological conditions for the design, construction, equipment and operation of facilities and types of waste for thermal treatment of waste, emission limit values and their monitoring and the Law on Waste Management, bearing in mind in particular the categories of waste to be incinerated;
  - that emissions of pollutants and energy into the air and water do not exceed the limit values for emissions of pollutants into the air from the incineration plant and the limit values for emissions of pollutants when discharging wastewater from the waste gas cleaning system of the incineration plant, prescribed in the annexes to the regulation, as well as the limit values prescribed by the relevant conclusions on the best available techniques;
  - that the construction and other technical requirements have been met, in accordance with a special regulation;
  - that during the waste thermal treatment, the obtained heat was used and used for the production of electricity, cogeneration production of thermal energy and electricity, **production of process steam for the needs of other industrial plants within the industrial complex (for the needs of production facilities within the Elixir Prahovo complex);**
  - that the conditions for reducing the quantities of waste incineration residues, their hazardous characteristics and their reuse are met, which is achieved by using the best available technologies;
  - that residues of waste after waste thermal treatment are minimized, that these residues are reused, if technically feasible and economically justified;
  - that incineration residues, the formation of which cannot be prevented, reduced or which are disposed of if they cannot be reused, in accordance with the regulation and regulations governing the incineration of waste;
  - that accident protection measures are envisaged;
  - that monitoring of operation is planned, which includes a program for monitoring emissions of pollutants into the air, soil and water.
- It is envisaged that the waste incineration plant will be managed by a qualified person who is responsible for professional work.

8.3.2.1 Measurement, reception and unloading of waste

- At the location for the operation of the waste thermal treatment plant in Prahovo by the incineration, it is provided a sufficient space for the reception, inspection and sampling of the received waste, i.e. the manipulative space where the undisturbed internal traffic of transport vehicles, loading and unloading of waste is carried out.
- Access to the Waste-to-Energy Plant will be done through internal roads that have been formed within the existing industrial chemical complex Elixir Prahovo. Vehicles with waste materials can enter

only through the gate of the Elixir Prahovo complex where the ramp and the guardhouse are located, and then after the first check and identification of the vehicle, the vehicle moves along the internal road to the Waste-to-Energy Plant itself, where the vehicle enters exclusively through the gate located on the southeast side of the complex.

- In order to control the entry/exit from the subject Waste-to-Energy Plant at the entrance, the facility W-C01 Reception guardhouse and administrative building are planned, where the inspection, verification, measurement, reception and examination of the delivered waste will be carried out.
- At the entrance to the thermal waste treatment plant, the installed scale will measure the mass of the waste transport vehicle and measure the waste received in the plant, i.e. complete control and registration of the reception.
- The waste thermal treatment plant is equipped with devices for washing vehicles before and after unloading waste into the plant, and the exit of clean vehicles outside the boundaries of the complex is ensured.
- Based on the characteristics of the thermal treatment plant, identification of types of waste that can be thermally treated (in terms of e.g. physical condition, chemical characteristics, hazardous properties and acceptable ranges of calorific value, humidity, ash content, etc.), as well as in accordance with the provisions of the Rulebook on waste categories, examination and classification ("Official Gazette of RS", No. 56/2010, 93/2019 and 39/2021) and the Regulation on technical and technological conditions for the design, construction, equipping and operation of plants and types of waste for waste thermal treatment, emission limit values and their monitoring ("Official Gazette of RS", No. 103/2023) **clearly defines the list of waste that may/may not be received and treated in the plant in question and which is attached to the study.**
- **It is strictly forbidden** to receive waste to the plant, that is explosive, flammable, infectious, radioactive, waste materials containing or contaminated with polychlorinated biphenyls (PCBs) and/or polybrominated triphenyls (PCTs) and/or polybrominated biphenyls (PBB), waste containing cyanides, isocyanates, thiocyanates, asbestos, peroxides, biocides, cytostatics, with the following characteristics:

HP 1	"Explosive": waste in which, due to chemical reactions, gas can be generated at such temperatures, pressures and rates that it can cause destruction in the environment. This includes self-igniting waste, explosive organic peroxide waste and explosive self-reactive waste.
HP 3	"Flammable": waste which, according to its properties, is easily ignited or which, due to friction, can ignite or contribute to the creation of a fire: - flammable liquid waste: liquid waste whose ignition point is below 60°C or waste gas oil, diesel and light fuel oil whose ignition point is in the temperature interval between > 55 °C and ≤ 75 °C; - self-igniting liquid and solid waste: solid or liquid waste that, even in small quantities, can ignite within five minutes after coming into contact with air; - flammable solid waste: solid waste that is easily flammable or can cause or promote fire by friction; - flammable gaseous waste: gaseous waste that can ignite after coming into contact with air at a temperature of 20 °C and a standard pressure of 101.3 kPa; - waste that reacts with water: waste that in contact with water releases flammable gases in dangerous quantities; - other flammable waste: flammable aerosols, flammable self-heating waste, flammable organic peroxides and flammable self-reactive waste.
HP 9	"Infectious": waste containing active microorganisms or their toxins, which are known or suspected to cause disease in man or other living organisms
HP 12	Release of acute toxic gases: waste that releases toxic or highly toxic gases in contact with water or acid (classified as acute toxic, cat. 1, 2 or 3)

- The project documentation defines the range of waste calorific value (finished fuel) from 7 MJ/kg to 20 MJ/kg that can be treated at the boiler, as well as humidity, ash content and ash particle size.
- The project documentation defines that waste containing more than 1% of halogen organic substances expressed as chlorine **cannot be treated** in the boiler.
- **Additional restrictions on reception** to the plant in question are waste substances in the form of aerosols, as well as organometallic compounds (spent metal-based catalysts, or organometallic wood preservatives) and aluminized paints.
- It is forbidden to receive waste sludge containing illicit hazardous substances whose reception and treatment is prohibited at the plant in question, in accordance with the following: radioactive sludge, sludge containing or contaminated with polychlorinated biphenyls (PCBs) and/or polybrominated triphenyls (PCTs) and/or polybrominated biphenyls (PBBs), sludge containing cyanides, isocyanates, thiocyanates, asbestos, peroxides, biocides, as well as sludge classified as explosive, highly flammable and flammable, infectious and sludge releasing toxic or highly toxic gases in contact with water, air or acid. The acceptance of substances exceeding the limit values of POPs (Persistent Organic Pollutants) substances will not be allowed, in accordance with Article 4 and Annex I, Section, of Regulation (EU) 2019/1021 of the European Parliament and Council dated June 20, 2019.
- It is the obligation of the Project Holder that when the vehicle with the waste material arrives at the location in question, the recipient of the waste, at the entrance to the complex, before receiving the waste, performs a radioactivity test of the delivered waste. If the meter detects elevated radioactivity, immediately inform the relevant republic inspection and the ministry, bearing in mind that it is strictly forbidden to receive radioactive waste at the warehouse in question, and give the driver an order to park the vehicle until the inspection arrives.
- It is the obligation of the Project Holder to regularly implement the procedures of pre-acceptance and acceptance of waste in accordance with the conclusions on the best available techniques[3] BAT9(c) and BAT11, as well as in accordance with the Regulation on technical and technological conditions for the design, construction, equipping and operation of plants and types of waste for waste thermal treatment, emission limit values and their monitoring. These procedures define the elements that are checked and verified when accepting the waste into the plant, as well as the criteria for accepting or not accepting waste.
- The acceptance of waste that can be reused or recycled is prohibited.
- Before receiving **non-hazardous waste**, the waste recipient will carry out the following verification procedures:
    1) documentation following the waste (Documents on the movement of waste, delivery notes, weighing sheet, etc.);
    2) Waste Examination Report prepared in accordance with the list of parameters for waste examination for the needs of thermal treatment in accordance with Annex 9 of the Rulebook on Waste Categories, Examination and Classification ("Official Gazette of RS", nos. 56/2010, 93/2019 and 39/2021);
    3) hazardous characteristics of waste, the substances with which it should not be mixed and precautions to be taken when handling waste;
- When receiving the waste, the recipient is obliged to check:
    1) all data on the waste generation process contained in the documents monitoring the movement of waste;
    2) the label, name, description of the waste and its physical and chemical properties and all necessary information required for the sampling and characterization of the waste before the thermal treatment;
    3) a description of the hazardous characteristics of the waste, the substances with which the waste cannot be mixed and the precautions to be taken by the operator when handling the waste in the thermal treatment process.

[3] Commission implementing decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration (notified under document C(2019) 7987)

- To ensure delivery compliance with accompanying documentation (waste characterization report, pre-testing report in accordance with BATC 9[117], etc.), rapid analyses (approximately 60 minutes) are planned, as needed, in accordance with BATC 9 and BATC 11[2], prior to acceptance at the location. To verify the physical and chemical properties of the delivered waste for treatment, representative samples will be taken and analyzed in the internal central laboratory.

  Rapid analyses will include testing of the following parameters: sensory properties, calorific value of the waste, ash content, moisture content, and total halogen concentration. These analyses will be performed in the internal laboratory located at the entrance to the complex. If the parameters deviate from expected values determined during the pre-acceptance process, the truck will not be allowed to unload until a complete analysis is conducted and all parameters from the pre-acceptance process are verified.

  If it is determined that the waste does not meet contractual agreements through the analytical process, acceptance will be denied. Additional testing of the waste may include determining the ignition temperature, halogen content, sulfur (S) content, heavy metals content, viscosity, density, POPs content, etc. (in accordance with BATC 9 and BATC 11[117]).
- Prior to the reception of **hazardous waste** in the facility in question, the waste recipient is obliged to carry out a reception procedure identical to that for the reception of non-hazardous waste, and in particular to carry out:
  1) checking the documentation following hazardous waste (Documents on the movement of hazardous waste, delivery notes, weighing sheet, etc.), and, if necessary, the documentation defined by the regulations governing the transport of hazardous goods (in accordance with the Law on the Transport of Dangerous Goods, etc.)
  2) taking representative samples of waste before unloading, in order to check compliance with the data from the accompanying documentation and the Report on Waste Testing prepared in accordance with Annex 9 of the Rulebook on Waste Categories, Examination and Classification ("Official Gazette of RS", nos. 56/2010, 93/2019 and 39/2021);
  3) measures enabling the relevant authority to inspect and identify waste subject to thermal treatment.
- In order to check the compliance of the delivery with the accompanying documentation, it is envisaged, if necessary, to perform rapid analyses (about 60 min.) before the reception at the site. During the rapid analyses, the following parameters will be examined: heavy metal content, determination of the calorific value of waste, ash content, moisture, illicit substances. Rapid analyses will be performed within the internal laboratory at the entrance to the complex.
- In order to check the physical and chemical properties of the delivered waste, before unloading the waste at the designated place and further referral to pretreatment and then thermal treatment, take representative samples and perform analysis and testing of representative samples as needed within the internal central laboratory, by examining the following parameters: sensory properties, ignition temperature, calorific value (MJ/kg), water or moisture content, ash content, total halogen content expressed as chlorine (Cl), sulfur content (S), polychlorinated biphenyls (PCB) content, heavy metal content: arsenic (As), antimony (Sb), copper (Cu), beryllium (Be), vanadium (V), mercury (Hg), cadmium (Cd), tin (Sn), cobalt (Co), nickel (Ni), lead (Pb), thallium (Ta), chromium (Cr) and zinc (Zn). If necessary, additional detailed analyses will be performed, such as the content of halogen substances individually (Cl, F, Br, I), cyanide content, viscosity, density, mechanical impurities, content of macro-elements (SiO_2, Al_2O_3, Fe_2O_3, CaO, MgO, TiO_2, Mn_2O_3, K_2O) and more.
- During the performance of rapid analyses, until the results of examination and confirmation of compliance with the data from the accompanying documentation are obtained, the transport vehicle with waste material must be temporarily parked in the foreseen area, Truck Parking, which is located directly next to the facility W-C01 Reception guardhouse and administrative building, and outside the fence of the Waste-to-Energy plant itself.
- Representative samples may only be taken by trained and equipped employees of the operator

[2] BATC - Commission implementing decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration (notified under document C(2019) 7987)

in accordance with regulations and standards in this field. The representative sample of waste represents a sample taken from the total amount of waste that has the same characteristics as the average waste composition and that is subject to chemical analysis.

- In addition to the central laboratory on the first floor of the facility, a warehouse for storing laboratory samples, the documentation archive room and the laboratory office are also planned.
- Wastewater generated from washing dishes and equipment in the laboratory should be collected and piped into a buried polypropylene tank (V=5 m^3), and then pumped into IBC containers and transported by a forklift for unloading to liquid waste storage tanks and then treated at the boiler plant in question.
- Within the central laboratory, 4 digesters are planned to prevent the spread of unpleasant odours when performing experiments and examinations of waste, wastewater, etc. Each digester is equipped with a ventilation system with an air purification filter and a roof outlet.
- All analyses may only be performed by professional staff of the appropriate profession (engineers, chemists, laboratory technicians, sampling technicians, etc.).
- Waste that does not meet the requirements for admission to the facility in question must not be accepted and it must be returned to the supplier without delay by the same means of transport.
- In order to determine the amount of waste received at the facility in question the measurement at the entrance to the waste thermal treatment plant on the intended freight scale (W-C10) is performed.
- After reception control and measurement, refer the vehicle to the truck wheel washer (U-C03 Wheel Washing Unit). It is envisaged to install a package unit that is based on a modular concept and is distinguished by a robust construction, as well as a large cleaning capacity. The wheels of the vehicles which has delivered the waste to the site of the plant must also be washed after unloading the waste, and before leaving the site in question.
- The water from the washing of the wheels of the trucks which has delivered the waste material is drained into the collection shaft located within the package wheel washer unit. The wastewater is then pumped into a tank where solids are deposited by passing water through the overflow chamber. The purified water is then reused by the pump to wash the wheels and therefore no outflow of water into the recipient is foreseen.
- Water reception tanks should be periodically cleaned of saturated water and precipitated substances, and the contents of the cleaning should be temporarily stored in the W-C08 facility until treatment at the plant in question.
- When taking over non-hazardous waste, the Project Holder is obliged to fill in and certify a copy of the Document on the movement of waste, in accordance with the Rulebook on the form of the document on the movement of waste and the instructions for its completion ("Official Gazette of RS" No. 114/13) and keep them for at least two years;
- In case of receiving hazardous waste, the shipper of hazardous waste is obliged to submit to the ministry responsible for environmental affairs and the Environmental Protection Agency, at least 48 hours before the start of movement, a prior notification with data on waste in electronic form, by entering the data into the information system of the National Register of Pollution Sources, in accordance with the Rulebook on the form of the Document on the movement of hazardous waste, the form of prior notification, the manner of its delivery and instructions for their completion. ("Official Gazette of RS", No. 17/17) and the law governing the protection of personal data. Upon receipt of hazardous waste at the location of the plant in question, it is the obligation of the Project Holder to submit to the Environmental Protection Agency, in electronic form, no later than 15 days from the end of the movement of waste, by entering the data into the information system of the National Register of Pollution Sources, the Form of the Document on the Movement of Hazardous Waste with the final, supplemented data on waste, in accordance with the law governing the protection of personal data. The recipient of hazardous waste shall also submit a fully certified and signed Waste Movement Document to the postal address of the Ministry and the Agency, in accordance with the law governing waste management.
- It is the obligation of the Project Holder to record and adequately dispose of the non-hazardous and hazardous waste in question immediately upon receipt at the location of the waste management plant in accordance with special regulations, i.e. it must keep records of the received quantities of non-hazardous and hazardous waste.
- It is the obligation of the Project Holder to keep daily reports on waste, and to submit the report

on annual quantities of waste to the Environmental Protection Agency on the basis of the Rulebook on the daily records form and the annual report on waste with instructions for its completion ("Official Gazette of RS", nos. 7/2020 and 79/2021); Reports must be kept in the company archives for the next five years.

- All legally required documentation, as well as documentation produced through pre-testing procedures and waste inspections upon receipt, will be consolidated with the measured mass at the point of delivery and stored under a uniquely generated code in the database for accepted waste. The documentation will be stored in an electronic database for waste accepted for treatment.
- The operational guidelines for waste acceptance and preparation for treatment prescribe verification of the compatibility of hazardous waste characteristics in accordance with compatibility matrices available in the European Commission's Integrated Pollution Prevention and Control Reference Document on Best Available Techniques on Emissions from Storage, July 2006. If such information is not available, a laboratory mixing test is conducted in the internal facility laboratory. In both cases, decisions regarding mixing and the conditions under which it is performed are made by an expert with a high level of chemical expertise.
- In order to automate and optimize the fuel mixing process in the bunkers, cranes have been designed for waste transfer and will be operated by operators from the Operations Centre facility.
- Different types of solid waste, depending on their characteristics, should be stored in, designed for this purpose, reinforced concrete, waterproof bunkers for the separation of compatible and incompatible types of waste.
- After the vehicle with waste material enters the unloading facility, the front door must be automatically closed. The unloading points in the receiving bunker itself will also be equipped with industrial segment doors, which open only when the truck is ready to unload waste into one of the aforementioned reception bunkers. The industrial segments of the doors are equipped with an electric drive with an automatic door stop when encountering an obstacle and the possibility of manual opening in the event of a power failure. When the unloading of the waste is completed, the bunker door is closed, the truck can then leave the facility, after which the main door at the entrance to the facility is closed again, which prevents the emission of unpleasant odours outside the facility.
- When operating the cranes, the external door of the facility cannot be opened (there is a blockage).
- In order to ensure the reception of a wide range of different types of liquid waste, all pipelines will be made of stainless steel with electric trace heating.
- It is the responsibility of the Project Holder to keep the place for storing the waste in question clean and tidy.
- Waste handling can only be carried out by trained and professional persons.
- It is mandatory to turn off the engine of transport vehicles when they are stationary, ie when unloading waste;

8.3.2.2 *Waste thermal treatment and production of thermal energy in the form of steam*

- The thermal waste treatment plant is fully automated, which enables control of incineration efficiency, monitoring of parameters and prevention/reduction of emissions.
- The thermal waste treatment plant is based on a fluidized bed boiler plant (BFB) with precise incineration control.
- The waste incineration plant will be equipped with at least one auxiliary burner which must be activated automatically when the process gas temperature drops below 850°C. The burner must be activated automatically when the process gas temperature drops below 850°C.
- In the waste incineration plant, the prescribed temperatures are measured near the inner wall of the incineration chamber.
- The auxiliary burner is not powered by fuel that can cause higher emissions than those resulting from the combustion of fuel oil, liquid or natural gas (For the operation of the burner on the plant in question, natural gas is used as auxiliary and ignition fuel).
- The incineration plant has and uses an automatic system to prevent the addition of waste:
  1) at the start-up of the plant, until the temperature reaches the level of 850 °C;

2) when the temperature is not maintained at 850 °C;

3) when it is determined by continuous measurement carried out in accordance with the Regulation that the limit values have been exceeded due to some malfunction or interruption of the operation of the waste gas cleaning plant.

- The project envisages a boiler plant with optimization of waste flow and composition, temperature, flow of primary and secondary combustion air in order to efficiently oxidize organic compounds while reducing the formation of NOx.
- The construction of the boiler is such as to allow a residence time of 2 seconds and a temperature of 850-950°C.
- The waste incineration facility operates to achieve a combustion level that ensures the total organic carbon (TOC) content in slag and boiler (furnace) ash is less than 3%, in accordance with Article 8 of the Regulation on technical and technological conditions for designing, constructing, equipping, and operating facilities and types of waste for thermal treatment, emission limit values, and their monitoring ("Official Gazette of RS", No. 103/2023), as a mandatory requirement for the technological solution.
- In line with BATC 20 WI, the minimum boiler efficiency requirement for hazardous waste treatment is 60-80%, and 60-70% for sludge from wastewater treatment. As the facility has the capability to use all the mentioned waste types, a minimum efficiency of 0.7, expressed in decimal terms, has been adopted. During operational work, significantly higher energy utilization than the stated minimum is expected, expressed in accordance with the methodology described in the Rulebook on waste categories, testing, and classification ("Official Gazette of RS", Nos. 56/2010, 93/2019, 39/2021, and 65/2024).
- In the event of a malfunction of the thermal waste treatment plant, it is the obligation of the Project Holder to reduce or completely cease the activity as soon as possible until the normal operation is established.
- It is conditioned by the project that the Waste-to-Energy Plant may in no case continue to operate for more than four hours without interruption if the emission limit values are exceeded, whereby the cumulative period of operation in such conditions must not exceed 60 hours during one year. The 60-hour period also applies to those lines in the plant that are connected to a single combustion gas treatment device.
- Carbon monoxide (CO) and total organic carbon (TOC) emission limits cannot be exceeded.
- It is the obligation of Project Holder to report to the relevant ministry the **Annual report, which refers to operation and monitoring of the waste incineration plant**. The report contains data on the incineration process and on emissions into air and water compared to the emission limit values set out in the Regulation on technical and technological conditions for the design, construction, equipping and operation of plants and types of waste for waste thermal treatment, emission limit values and their monitoring ("Official Gazette of RS", No. 103/2023).
- Annual monitoring reports on the complex in question will be submitted to the relevant authority in accordance with the Regulations of the methodology for the development of the national and local register of pollution sources, as well as the methodology for the types, methods and deadlines for data collection ("Official Gazette of RS", nos. 91/2010, 10/2013, 98/2016 and 72/2023).

8.3.2.3 Procedures for solid residues from the boiler plant

- The incineration process is designed in such a way that the amount of residues from the boiler plant is minimized and that the environmental and human health impacts are minimized.
- The residues will be treated on-site or off-site, whenever possible, in accordance with the regulation governing waste management.
- For waste incineration plants, the change in operating conditions must not cause higher residues or residues with a higher content of organic pollutants compared to those residues that can be expected in accordance with the conditions referred to in Article 12. Regulation on technical and technological conditions for the design, construction, equipping and operation of plants and types of waste for waste thermal treatment, emission limit values and their monitoring ("Official Gazette of RS", No. 103/2023).

- The ash suspension from the reactor and the ash suspension storage, together with the gypsum suspension from SO_2 Scrubber is delivered to the centrifuges (where the separation of the solid and liquid phases is performed) and ends up in the equipment for the transport of incineration residues in the boiler plant (slag and ash).
- It is envisaged that before determining the manner of disposal or recovery operations of the residue from the incineration plant, appropriate examinations will be carried out to determine the physical and chemical properties and potential pollution from various residues from the incineration process, in accordance with the Rulebook on Waste Categories, Examination and Classification ("Official Gazette of RS", nos. 56/2010, 93/2019 and 39/2021); The examinations shall cover in particular the total soluble fractions and the heavy metals in the soluble fraction.
- In order to manage all waste streams generated by the operation of the subject fluidized bed boiler plant (slag, boiler ash, cyclone ash, economizer ash, filter ash, activated carbon with a fraction of fine particles from flue gas and sludge/thickened sediment from wastewater treatment) and to dispose them in accordance with the Law on Waste Management and related by-laws, all streams are collected in a controlled manner by the designed boiler conveyor system and taken to the stabilization and solidification plant (W-C12).
- In order to harmonize the characteristics of the solid residues from the boiler plant and bring them to a state suitable for disposal at the subject Landfill for non-hazardous waste in accordance with the criteria defined by the Rulebook on Waste Categories, Examination and Classification ("Official Gazette of RS", nos. 56/2010, 93/2019 and 39/2021), the Regulation on disposal of waste on landfills ("Official Gazette of RS", No. 92/2010), i.e. with the EU Landfill Directive (Directive (EU) 2018/850 of the European Parliament and of the Council of 30 May 2018 amending Directive 1999/31/EC on the landfill of waste), the first step in the solid residue treatment process is the **removal of metals from coarse ash ("bottom ash")** using magnetic separation and separation induced by a magnet (eddy current). The second step is the process of stabilization (when reactions take place in which controlled hydrogen release occurs, chromium (Cr(VI)) reduction reaction, etc.) and **solidification** by adding cement, water and, if necessary, additives in accordance with previously performed waste analyses. The aim of the treatment is to process solid residues from the boiler plant, curing and obtaining material that is formed at the landfill into a material with high mechanical strength, low permeability and encapsulated pollutants, i.e. low leaching rate.
- It is the obligation of the Project Holder to regularly, before the very beginning of the solidification process, examine the physical and chemical characteristics of previously stabilized residues from the boiler plant, in accordance with the Rulebook on Waste Categories, Examination and Classification ("Official Gazette of RS", nos. 56/2010, 93/2019 and 39/2021), Appendix 8 List of parameters for determining the physico-chemical properties of hazardous waste intended for physico-chemical treatment.
- Analyses of physical and chemical properties should be performed on a representative sample taken, within the laboratory provided for in the plant. Based on the test results, the recipes and material balances for the solidification process will be defined.
- The obtained solidificate, a product of physical and chemical treatment, will be examined and classified in accordance with the Rulebook on Waste Categories, Examination and Classification ("Official Gazette of RS", nos. 56/2010, 93/2019 and 39/2021): Disposal of non-reactive hazardous waste at landfills for non-hazardous waste. If these results meet the conditions prescribed for the disposal of non-reactive hazardous waste at landfills for non-hazardous waste, the solidified material will be disposed of at the Landfill for non-hazardous waste. On the other hand, if this is not the case, the solidificates will be sent to the authorized operator of landfills and/or hazardous waste storage.
- Waste examining must be carried out through professional organizations and other legal entities authorized for sampling and characterization according to the scope of examination for which they are accredited, in accordance with special regulations. Waste characterization is performed for hazardous waste and for waste that, according to its origin, composition and characteristics, may be hazardous waste. Waste examination reports must be kept in the archives of the company for at least five years.
- In order to reduce the retention time of solid residues from the boiler plant in the stabilization and solidification facility, the project envisages a mixer for solidification of appropriate capacity, and for

the purpose of disposal of solidificates that has the characteristics of non-reactive hazardous waste, the Landfill for non-hazardous waste is designed next to the plant.

8.3.2.4 *Air protection measures*

- The incineration plant is designed, and will be equipped, built and operated so that after the last injection of air into the incineration process, the process gases reach a temperature of at least 850 °C for two seconds of duration in a controlled and homogeneous manner, even under the most unfavourable conditions.
- Ventilation of the space in which IBC containers /barrels/jumbo bags are located, as well as the space of the transfer station from IBC containers/barrels, is provided through axial wall fans for suction from the space with floating blinds. The air compensation is from the facade of the building over 4 rain blinds.
- The air from the sludge compartment should be taken to the boiler plant using a combustion air fan, in order to keep the storage under pressure and prevent the spread of unpleasant odours outside the facility. Air compensation is from the facade of the building. When the boiler plant does not work, nitrogen is automatically introduced into the sludge reception bunker in order to inertize the space.
- In order to reduce air emissions from storage tanks, the tanks are equipped with:
  - nitrogen maintains a constant overpressure of 0.3 barG in tanks, which ensures that there are no unpleasant odours or vapours of stored liquids in the room.
  - exhaust gas drainage system via automatic valves on the outlet pipelines from the gas tank space. When reaching a pressure of 0.4 barG in the tank, the valve is opened and the gas is discharged, which is taken by pipeline to the intake of the combustion air fan in the boiler installation, and then to the thermal treatment. As the vessels are maintained under nitrogen overpressure, the composition of the exhaust gas is predominantly nitrogen.
  - If for any reason these systems fail, the tanks are equipped with safety and relief valve that allows pressure relief, i.e. prevents the occurrence of vacuum.
- Ventilation of the space in which the storage tanks (of combustible and easily volatile liquids) are located is provided through 2 channels with associated elements for inserting and exhausting air from the space.
- Ventilation of the space in which the storage tanks for oily and bilge water are located is foreseen through the suction ducts by which the air is taken to the intake of the combustion air fan in the boiler plant, and then to the thermal treatment. In case of downtime of the boiler plant, an axial wall fan is provided for ventilation of this space for suction from the space with a floating blind. The compensation of air is from the external roller doors from this room, as well as the rooms for unloading waste and service reception of the rake and pretreatment of non-hazardous and hazardous waste.
- When transferring liquid waste from tank trucks to the gas phase arm, a pressure balancing line is connected, which represents the connection with the gas space of the tank to which the transfer is carried out in case that the discharge is carried out into one of the tanks under overpressure of nitrogen, in order to prevent the evaporation of easily volatile liquids when discharging.
- When transferring waste, the engine of the transport vehicle must be switched off, and the tank truck must be properly grounded.
- The project envisages a flue gas cleaning plant from the boiler plant, and before discharge into the atmosphere, which includes:
  - **dry flue gas cleaning system** (cyclone, bag filter system and activated carbon filter) in which the separation of first, larger particles of fly ash, and then the separation of dioxins and heavy metals by adsorption of said particles into the pores of activated carbon, and finally the removal of particulate matter.
  - **wet flue gas cleaning system** (scrubber system - HCl Scrubber and SO_2 Scrubber). In the HCl scrubber, cooling of flue gases to saturation temperature in contact with water and absorption of halogen and SO_3 compounds takes place. The second (SO_2) scrubber is used to remove sulfur oxide from the flue gases.
  - **NO_x catalytic reduction system** (SCR system).

- The waste incineration plant is designed and equipped so that the limit values of emissions into the air from Appendix 2 LIMIT VALUES FOR EMISSIONS OF POLLUTANTS INTO the AIR of the aforementioned Regulation are not exceeded during operation, as well as the values prescribed by the conclusions on the best available techniques Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control Commission Implementing Decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration.
- Waste gases from the waste incineration plant will be discharged in a controlled manner through a smokestack whose height has been calculated in such a way as to protect human health and the environment.
- It is envisaged that measurements of pollutants into the air from the incineration plant are carried out in accordance with Annexes 2, 3 and 6 of the Regulation on technical and technological conditions for the design, construction, equipping and operation of plants and types of waste for waste thermal treatment, emission limit values and their monitoring ("Official Gazette of RS", No. 103/2023), in accordance with the monitoring prescribed in Chapter 9 of this Study and the Integrated Permit.
- Measurement will be performed by standardized methods in accordance with the conditions of measurement referred to in Article 15 of the Regulation, the method of calculation referred to in Article 17 of the Regulation and Annex 5. FORMULA for calculating the EMISSION CONCENTRATION UNDER NORMAL OXYGEN CONCENTRATION PERCENTAGE CONDITIONS.
- The measuring points will be determined in accordance with the regulation governing the emission of pollutants into the air (Regulation on the measurement of emissions of pollutants into the air from stationary sources of pollution "Official Gazette of RS", No. 5/2016).
- All emitters must have designated measuring points for monitoring emissions of air pollutants, fully in compliance with the SRPS ISO 9096:E standard. The positioning and equipment of representative measuring points are determined by an authorized legal entity in accordance with the requirements and recommendations of the SRPS EN 15259 standard. Measuring points must be sufficiently large, easily accessible, and equipped to allow measurements to be carried out properly, safely for the operator, and representative of emissions from the stationary pollution source, considering metrological conditions. Generally, it is required to ensure that the emitter has no disturbances (bends, dampers, openings, etc.) either before or after the measuring opening within a distance of 5 hydraulic diameters of the emitter, to provide conditions for isokinetic sampling of particulate matter.
- The project holder is obliged, in accordance with Articles 15 and 16 of the Regulation on Measuring Emissions of Air Pollutants from Stationary Sources ("Official Gazette of RS", Nos. 5/16 and 10/24), to develop an Emission Measurement Plan for all stationary emitters under their operation. The plan is created in cooperation with an authorized legal entity for emission measurements. If changes occur in the stationary source over time (reconstruction, fuel or raw material changes, etc.) or regulatory changes arise, it is necessary to update the existing measurement plan. The content of the Emission Measurement Plan is provided in Section A, Annex 4 - Emission Measurement Plan and Emission Measurement Report, of the mentioned Regulation.
- The transport and temporary storage of dry residues, such as boiler ash and dry residues from the flue gas purification process, must be conducted in a manner that prevents their dispersion into the environment. Transport and storage must be carried out in sealed containers.
- Dedusting of the solid residue storage from the boiler plant and its solidification equipment should be carried out through a bag filter system where particulate matter was separated.
- The cement silo, mixer, cement weighing scale and solid residue weighing scale are equipped with a filter that prevents the emission of powdered substances into the atmosphere. Measurement of differential pressure with a high value alarm is provided on the aforementioned filters. If there is an increase in differential pressure, the alarm and the self-shaking system are activated (the filter self-shaking system is part of the filters themselves).
- The project holder is obligated, during the trial operation of the stationary pollution source and the process of obtaining an operational permit in accordance with planning and construction

regulations, to conduct guarantee emission measurements. Guarantee measurements are carried out to compare the measured pollutant emission levels with the emission limit values defined in Chapter 9 of the study. Guarantee measurements are performed under operating conditions at the maximum load of the stationary pollution source.

8.3.2.5 *Water and soil protection measures*

- All waste material should be stored in a closed facility, with a waterproof concrete floor, under strictly controlled conditions, so that there is no possibility of water and land pollution and no possibility of access by unauthorized persons.
- The access road for the reception/dispatch of liquid waste materials in tank trucks is levelled in such a way that it has a drop towards the existing road and that it is raised from the existing terrain about 20 cm and from the second branch of the access road the water from the road flows towards the existing road. All service roads from this area will be connected to the rain sewer collector, and before entering the stormwater into the collector, they will be treated on the grease and oil separator;
- Within the transfer point, the installation of a line grate is planned, which will collect any leaked liquids during transfer and drain them to the collection pit. In this way, the possibility of leakage of the leaked fluid into the atmospheric sewerage and the surrounding soil is avoided.
- The contents of the collection pit will be pumped into IBC containers by the pump, which will be transported to the IBC container warehouse, and then treated at the Hazardous Waste Treatment Line (delivered in IBC containers, barrels, etc.).
- In the case of a small-scale spillage, appropriate absorbents for the collection of potentially leaked content (sawdust, sand, oil, alkali and acid absorbents) will be provided within the transfer station for the collection and dry cleaning of the leaked content. The contaminated sorbent will be disposed of in containers and subsequently treated at the plant in question.
- In addition to the transfer point (W-C13), it is also planned to install a shower for the purpose of rinsing hands and eyes in case of pouring on the operator when discharging liquid waste (in case of an accident). The water from the shower flows into the aforementioned manhole.
- IBC containers/barrels with waste material should be stored separately in the rack or non-rack part of the warehouse, according to the waste groups and their compatibility.
- All containers with hazardous substances where there is a possibility of damage and discharge of liquid or powdery hazardous substances must be stored in appropriate standard portable bundwalls.
- Liquid hazardous waste must be packed in packaging that is approved (UN code, http://www.unpackaging.com/) for the international transport of dangerous goods, and that meets the following criteria:
    - strong enough to withstand shocks, loading, displacement from pallets or removal from over-pack packaging, suitable for manual or mechanical handling,
    - made and closed in such a way as to prevent loss of contents during preparation for transport, transport, due to vibration or change in temperature, pressure, humidity,
    - is closed according to the manufacturer's instructions so as to prevent the occurrence of waste outside the packaging.
- In all storage facilities, envisage corridors that will be used for handling, i.e. bringing waste by forklifts or trolleys for storage in designated and marked places.
- It is the obligation of the Project Holder to periodically check the structural integrity of the vessels (mechanical cracks) and the occurrence of leaks. In case of need, certain measures will be taken such as replacing the packaging (container), rehabilitation of accidentally spilled contents, etc. In order to carry out the aforementioned control smoothly, access to the hazardous waste warehouse should be easy and free for easy repackaging, measurement, sampling, transport, etc.
- A sufficient number of mobile bundwalls will be provided for the collection of any leaked contents, as well as appropriate absorbents for the collection and dry cleaning of the leaked contents (sawdust, sand, oil, alkali and acid absorbents).
- Dispose the contaminated sorbent in intended containers for the collection of hazardous waste until further disposal and dispose it in a temporary storage facility for hazardous waste;

- In the storage room of IBC containers and barrels, drainage grids are designed, which will carry all possibly leaked contents or water from washing to the collection pit. It is the obligation of the Project Holder to regularly maintain and empty the contents of the collection pit and to treat the contents of the pit at the boiler plant in question.
- Different types of liquid waste should be stored in divided, separate tanks located in concrete waterproof bundwalls, depending on the characteristics of the waste (combustible, non-combustible, easily volatile, etc.).
- In the bundwalls of the tanks, pumps are located, which will be used for transferring, possibly spilled liquid waste materials, from the bundwall to the appropriate tank.
- Bundwalls are dimensioned in the manner defined by the Rulebook on Technical Norms for Fire and Explosion Safety of Plants and Facilities for Flammable and Combustible Liquids and on Storage and Transfer of Flammable and Combustible Liquids (Official Gazette of RS nos.114/2017, 85/2021).
- Each tank will be equipped with the necessary instrument equipment with a level meter with remote indication on the PLC, a high level switch as overfill protection, which upon reaching the high level stops the pump for receipt from the vehicle transfer point.
- Store sludge waste in a separate watertight bunker intended for this purpose only.
- Unload the sludge by tipping from the truck directly into the sludge reception bunker. After the unloading is completed, the transport vehicle leaves the facility, and the lid of the reception bunker closes.
- The sludge reception and dosing system is automated to control and monitor the process from the reception of sludge to its dosing into the thermal treatment furnace.
- In order to protect water and soil within the plant, a separate sewerage system is envisaged for:
    - Atmospheric water from the roof of the facility;
    - Oily atmospheric waters;
    - Sanitary-foul wastewater,
    - Technological wastewater,
    - Wastewater from extinguishing possible fires.

  In all water treatment systems, devices are provided for measuring water flow, as well as measuring water quality at the inlet and outlet of the plant.
- Wastewater arising from wet flue gas cleaning should be treated at the wastewater treatment plant in the boiler plant consisting of:
    - three-stage neutralization,
    - the settling of heavy metals,
    - flocculation,
    - sedimentation and
    - filtration.
- Wastewaters from Waste-to-Energy Plant, created after the waste gas cleaning process, are discharged in accordance with the permit issued on the basis of special regulations, that is, with the water conditions obtained in the process of obtaining the location conditions governing this area.
- Monitoring of the concentration of pollutants in wastewater is planned and will be carried out in the manner and within the deadlines determined in accordance with the Regulation on technical and technological conditions for the design, construction, equipping and operation of plants and types of waste for waste thermal treatment, emission limit values and their monitoring ("Official Gazette of RS", No. 103/2023), regulations governing water quality management and the issued permit.
- The discharge of wastewater into the recipient is maximally limited to the extent possible, so that the emission limit values are in accordance with Appendix 4. LIMIT VALUES FOR POLLUTANT EMISSIONS IN WASTEWATER FROM THE WASTE GAS TREATMENT PROCESS GENERATED IN THE PLANT FOR INCINERATION AND CO-INCINERATION OF WASTE of the Regulation, as well as in accordance with the conclusions on the best available techniques

  Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control Commission Implementing Decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste

incineration.

- Wastewater may be discharged into the recipient after special treatment, in accordance with the issued permit, if:
  1) the discharge is carried out within the prescribed emission limit values, in accordance with the regulation and other regulation;
  2) mass concentrations of pollutants do not exceed the emission limit values set out in Annex 4 of the Regulation.

  Emission limit values are applied at the point where the wastewater generated in the waste gas treatment process containing pollutants referred to in Annexes 2 and 3 of the Regulation is discharged, in this case at the point of discharge of wastewater into the collector of all clean and treated waters of the Waste-to-Energy Plant.
- The Project Holder must perform appropriate material balance calculations to determine the emission levels in the final discharged wastewater that may in some way be associated with the water from the gas from incineration cleaning process, in order to verify compliance with the emission limit, values set out in Annex 4 of the Regulation for wastewater from the incineration gas treatment process.
- The project solved the wastewater treatment, i.e. wastewater cannot be diluted in order to achieve the emission limit values from Annex 4 of the Regulation on technical and technological conditions for the design, construction, equipment and operation of plants and types of waste for thermal treatment of waste, limit values of emissions and their monitoring ("Official Gazette of RS", No. 103/2023).
- Within the subject complex, a wastewater reception pool with separate chambers is planned to provide sampling and checking of water quality before discharge to the recipient.
- In case that the quality of wastewater collected in the pool does not meet the criteria defined for the discharge of water into the recipient (Danube River), the project envisages returning the water back to the wastewater treatment boiler plant via a sand filter system and an activated carbon filter. In case that it is still not possible to purify the water to the required quality for discharge into the final recipient, the contaminated wastewater should be diverted to the liquid waste tank and from there to thermal treatment in the boiler.
- Before discharging into the clean water collector, sanitary-foul wastewater must be treated at the mechanical and biological treatment plant. Buried biological purifier with continuous recirculation of activated sludge with a capacity of 20 PE (40 employees) is planned. Purified wastewater should be discharged into the collector of conditionally clean rain sewage and then into the internal network of the Elixir Prahovo Industrial Complex, which ends with a discharge into the Danube River. Two bypass separators are planned for the efficiency of separating light petroleum products - light liquids in the separator outlet water up to 5mg/l.
- Potentially oily atmospheric water from all manipulative surfaces, roads and parking lots should be drained to the grease and oil separator for treatment before discharge into the recipient (with the collector of conditionally clean rainwater, purified water is conducted to the drainage Central collector for the entire Elixir Prahovo complex, and through it is discharged into the Danube).
- It is the obligation of the Project Holder to regularly clean and maintain the grease and oil separators and to treat the resulting sediment in accordance with the Law on Waste Management and by-laws in this field. An appropriate document shall be drawn up/completed on the amount and type of waste.
- It is the obligation of the Project Holder to regularly test the quality of wastewater on the grease and oil separator 4 times a year, through an authorized legal entity. The quality of wastewater must be in accordance with the Law on Waters ("Official Gazette of RS", nos. 30/2010, 93/2012, 101/2016, 95/2018 and 95/2018 - other law), the Rulebook on the manner and conditions for measuring and testing the quality of wastewater and the content of the report on the performed measurements ("Official Gazette of RS", No. 33/2016) and the Regulation on Emission Limit

  Values of Pollutant into Water and Deadlines for Their Reaching ("Official Gazette of the Republic of Serbia", nos. 67/11, 48/12 and 1/16).
- The dynamics of discharge and cleaning of the separator depends on the amount of sludge and petroleum products separated, i.e. on the method of operation and manipulation at the site itself (the interval must not exceed 6 months);

- The Waste-to-Energy plant, including the storage areas for waste within the plant area, is designed in such a way as to prevent illegal and unintentional leakage of pollutants into the soil, surface waters or groundwater, in accordance with the regulations.
- For diesel generators, which are planned to provide an alternative power supply solution, and their diesel fuel tanks, envisage a technical solution with the necessary protection in order to prevent pollution of surface and groundwater in the event of accidents.
- Wastewater generated by washing the process equipment used for solidification of residues from the boiler plant should be collected in the collection pit located in the facility W-C12 Stabilization and solidification. Return the collected water from washing the equipment to the solidification process. In this way, the consumption of process water is saved, and the required humidity of the material is also achieved, as well as the prevention of dust emission when manipulating residues from the boiler plant.
- Wastewater from fire extinguishing and other contaminated water that cannot be purified to the required quality for discharge into the final recipient (Danube River) must be thermally treated at the boiler plant in question.

8.3.2.6 Noise protection measures

- All activities related to waste handling as well as equipment that can emit noise are located in closed facilities.
- Regularly monitor the condition of noise-emitting equipment through a regular maintenance plan. Additional verification of the integrity of the equipment should be carried out by establishing an inspection plan, as well as an equipment testing plan.
- Noise at the boundary of the complex must not exceed the limit value for the zone it borders, i.e.:
  - For day and evening 60 dB(A) and
  - For the night 50 dB(A).
- Facilities that are not part of an indivisible technological whole are separated, in order to minimize noise levels. The plant itself is not near other noise emitters.
- The obligation of the Project Holder is to perform noise measurement at the nearest residential buildings during the commissioning of the plant
- In case of exceeding the allowable noise level, the Project Holder is obliged to implement additional measures in order to reduce and achieve the allowable noise level.

8.3.3 Environmental protection plans and technical solutions during regular operation of the Landfill for non-hazardous waste

In accordance with the Regulation on the disposal of waste at landfills ("Official Gazette of RS", No. 92/2010), a landfill of non-hazardous waste for the disposal of stabilized and solidified residues from the boiler plant at the location in Prahovo was designed:

- In order to meet the necessary conditions for preventing pollution of soil, underground and surface water, air and to ensure controlled management of leachate.
- The protection of soil, groundwater and surface water is achieved by the combination of the geological barrier and the bottom impermeable layer during the active phase of the landfill and the combination of the geological barrier and the upper impermeable layer during the passive phase after the landfill closure.
- During the design of the landfill, the technical and technological conditions for the construction of the landfill were complied with in accordance with Appendix 2. – Technical and technological conditions for the design, construction and commissioning of the landfill, relating to:
  1) landfill body;
  2) manipulative serving plateau;
  3) roads and necessary infrastructure;
  4) pools for collecting atmospheric and leachate wastewater;
  5) vegetation protection belt.
- The landfill operation procedure will be carried out in accordance with the technical and technological conditions provided for in the design and technical documentation, permit, law and regulation.

- Waste can be accepted at the landfill only if it meets the criteria for accepting waste at the Landfill for non-hazardous waste. The criteria for accepting or not accepting waste at the landfill are the limit values of the parameters for the disposal of solid, non-reactive hazardous waste (stabilized and solidified).
- Solid non-reactive hazardous waste is one whose leachate is equivalent to that for non-hazardous waste and which meets the limit values of the parameters for the disposal of non-reactive hazardous waste at landfills for non-hazardous waste in accordance with Annex 8, item 2. Disposal of non-reactive hazardous waste at landfills for non-hazardous waste in cassettes that are not used for disposal of biodegradable waste and Annex 10. List of parameters for waste testing for disposal, Rulebook on waste categories, examination and classification ("Official Gazette of RS", nos. 56/2010, 93/2019 and 39/2021);
- Only pre-treated waste is disposed of at the landfill in accordance with the Law on Waste Management and other regulations.
- The acceptance of waste into a landfill is carried out according to a procedure that includes the following actions:
    1) disposal waste examination;
    2) compliance check;
    3) on-site check.
- Examination of waste for disposal shall be carried out for each type of waste, in accordance with a special regulation, and sampling in accordance with the prescribed standards. Data obtained by testing waste for disposal at a landfill, in particular must contain:
    1) a description of the previous waste treatment or a statement that the waste can be disposed of without prior treatment;
    2) composition of waste and leachate;
    3) the class of landfill to which the waste is disposed;
    4) proof that the waste is not waste from Article 9 of the Regulation on landfill disposal;
    5) special requirements and measures to be taken when disposing of, if necessary, in accordance with Article 13 of the Regulation on landfill disposal;
    6) certain key parameters for checking compliance, as well as its dynamics.
- For waste regularly produced in the same procedure and in the same plant, the examining in paragraph 1 of this Article produces data which particularly refer to:
    1) variability in the composition of individual types of waste;
    2) limits of variability of significant properties.
- Testing of waste intended for disposal should be carried out by hiring an authorized professional waste testing organization in accordance with the Law on Waste Management.
- The data obtained from waste testing are an integral part of the waste testing report for disposal submitted by the Project Holder to the competent authority.
- For waste regularly produced in the same process (S/S) in the plant in question, for which there is data specified in Article 16, paragraphs 2 and 3 of the Regulation on the disposal of waste at landfills, if the measurement results show small deviations from the limit values of the disposal parameters, testing should be performed at the first delivery, and then periodic compliance verification in accordance with the Regulation.
- The compliance check shall be performed periodically, at least once a year, in order to check the waste that is regularly delivered for disposal in order to determine whether the parameters of that waste correspond to the parameters obtained by testing the waste for disposal and whether they meet the limit values of the parameters for waste disposal. The compliance check should be performed only for those parameters that are determined as critical when testing waste for disposal.
- When checking compliance, the same tests that were used in testing waste for disposal will be applied.
- For waste whose characteristics are variable, waste to be disposed of shall be tested for each batch of waste and shall not be subject to compliance checks.
- It is the obligation of the project holder to regularly check the waste on site by visual inspection of each batch of waste before and after unloading, as well as checking the accompanying documentation in accordance with the Regulation on the disposal of waste at landfills. Waste is accepted at the landfill if it has been determined on the spot that it is identical to the waste for

which the testing was performed, i.e. compliance check.

- The project holder must not accept waste at the Landfill for non-hazardous waste if it does not meet the requirements for disposal set out in the permit, when different types of waste are mixed, i.e. when the delivered waste poses a risk to human health and the environment and when the conditions for disposal prescribed by the Regulation on the disposal of waste at landfills and the Law on Waste Management are not met.
- It is the obligation of the project holder to prepare a location plan of the landfill during the disposal of waste (zoning of the disposal site of each batch of waste) with exactly indicated micro locations of cassettes in which solid non-reactive hazardous waste is disposed of and to keep it both during operation and after the closure of the landfill.
- In cases where the waste does not correspond to the thermally treated formula with a known composition of combustion residues, rapid leaching analyses (surrogate tests) must be conducted in the internal laboratory to determine the expected leaching of materials per standards defined by regulations. Using the accredited method NEN 7345 Leaching Characteristics of Soil and Stony Building and Waste Materials (or an equivalent method), the compatibility of waste for disposal as non-reactive hazardous waste in the non-hazardous waste landfill, in accordance with the Rulebook on waste categories, testing, and classification ("Official Gazette of RS", Nos. 56/2010, 93/2019, 39/2021, and 65/2024), will be determined following a leaching test of 64 days or shorter, with corrections to the limit values as per the mentioned Rulebook. If the acceptance of waste that requires additional or repeated testing is denied, temporary storage of the waste can be permitted within designated landfill areas for a period not exceeding four months. The competent authority responsible for issuing permits must be notified regarding the rejection of waste for landfill disposal.
- Waste that fails to meet prescribed criteria for disposal in the non-hazardous waste landfill in accordance with the Regulation on Waste Disposal at Landfills ("Official Gazette of RS", No. 92/2010) and the EU Directive (Landfill Directive 1999/31/EC, Council Decision 2003/33/EC for disposal to Non-hazardous Waste Landfill) will, upon receiving test results, be removed from the respective landfill and handed over to an authorized operator for further disposal within the country or abroad, through an authorized operator who holds the necessary license and appropriate vehicles for transporting hazardous waste in compliance with regulations on the transport of dangerous goods.
- In accordance with Appendix 5 – Procedures and mode of operation of the landfill of the Regulation on the disposal of waste at landfills, it is the obligation of the Project Holder to comply with the procedures and mode of operation of the landfill when disposing of waste at the landfill, which refers to:
    - **movement regime and operating procedures for all vehicles entering the landfill complex;**

(1) control and visual inspection of waste at the entrance;
(2) measurement of waste over the weighbridge;
(3) movement along service roads to the active section of the landfill;
(4) unloading of waste to the planned location – landfill segment;
(5) washing the wheels of the unloaded vehicle after unloading on the package washing unit;
(6) departure of the clean vehicle from the landfill;
(7) in the working zone of the landfill there are vehicles for spreading and compacting waste and they do not leave the landfill complex

    - **rules applicable when disposing of waste;**

(1) waste disposal begins at the lowest level of the landfill;
(2) ensure that the daily, working area is kept as small as possible;
(3) each batch of waste brought in shall be immediately spread out and compacted;
(4) "layers" of waste are formed up to the projected height;
(5) provide the projected slopes of the work surface;
(6) provide and define individual segments on the landfill body for each batch of waste material accepted at the landfill;
(7) a layer of compacted waste is sprayed with water in order to reduce air pollution;

    - **control of the formation and quality of leachate at the landfill;**

(1) control of the type and quantity of waste unloaded;

(2) control of the implementation of the designed technological process of landfill exploitation;
(3) control of maintenance of landfill bodies and roads;
(4) quality control of washing of transport vehicles;
(5) control of the quantity and quality of leachate;
(6) control of worker protection;
- **control of the formation and quality of leachate at the landfill;**

(1) temperature at the entrance to the designed facility and ambient air temperature;
(2) pH value of the leachate at the inlet and the purified liquid at the outlet of the designed facility;
(3) consumption of permanganate;
(4) BOD (biological oxygen demand);
- **control of particulate matter emissions from the landfill body.**

- At the very entrance to the landfill complex, there is a gate and a reception desk, so that, first of all, a check is carried out, a waste reception control is carried out and a sample is taken for the purpose of waste analysis.
- At the entrance to the landfill, place a sign made of durable material with permanent inscriptions, containing the name, the landfill operator's name, the landfill class, the address of the company disposing of the waste, operating hours, types of waste allowed for disposal, types of waste not allowed for disposal, and other significant information.
- After visual inspection of the condition of the waste and verification of the accompanying documentation, it is the obligation of the waste recipient, a qualified person responsible for professional work at the landfill, to fill in part D of the Document on the movement of waste/hazardous waste in accordance with the Rulebook on the form of the document on the movement of waste and the instructions for its filling ("Official Gazette of the Republic of Serbia", No. 114/13) or the Rulebook on the form of the Document on the movement of hazardous waste, the form of prior notification, the manner of its delivery and the instructions for their completion ("Official Gazette of RS", No. 17/17).
- When receiving each batch of waste, the authorized persons of the accredited laboratory will take a sample (the minimum amount of matter necessary for laboratory tests) of the solidificate, which is further analysed in accordance with the Rulebook on Waste Categories, Examination and Classification ("Official Gazette of RS", nos. 56/2010, 93/2019 and 39/2021): Disposal of non-reactive hazardous waste at landfills for non-hazardous waste.
- Testing of the taken waste samples should also be carried out within the internal laboratory designed as part of the Waste-to-Energy Plant. Leaching tests for the monolithic waste in question (solidificate) will be performed according to the standard NEN 7345 Leaching Characteristics of Soil and Stony Building and Waste Materials – Leaching Tests – Determination of the Leaching of Inorganic Components from Building and Monolithic Waste Materials with the Diffusion Test (or equivalent method). The values of the concentration limit value are given by the above Rulebook in relation to the 64-day test. For the purpose of obtaining preliminary rapid analyses for the test, use a shorter test, whereby the concentration limit values for individual parameters are adjusted to the duration of the test, in accordance with the aforementioned Rulebook.
- In order to protect against air pollution, i.e. to prevent the spreading of fine-grained material from the landfill, regular spraying of the landfill with water is planned.
- In case there is insufficient atmospheric water for irrigating the landfill, a water tanker will be provided.
- It is planned to establish on the landfill a completely closed system of water circulation from the landfill. Two separate water collection systems are envisaged:
  - Leachate collection system by which water is transported to the wastewater pool provided in the space of the Waste-to-Energy Plant and
  - The system for collecting atmospheric runoff from the landfill slopes to be collected and used for spraying water on the landfill slopes, thus achieving water recirculation.
- From the leachate pool, an emergency overflow to the stormwater pool is planned, in case of termination of the operation of the pump for transport to the wastewater pool in the area of the Waste-to-Energy Plant
- An emergency overflow is planned from the stormwater pool, which in the event of extreme

precipitation will allow water to be evacuated into the peripheral canal of the phosphogypsum storage facility, which is located on the south side of the future Landfill for non-hazardous waste.

- In order to protect soil and groundwater, the bottom of the landfill body will be arranged as follows:
  - the excavation of humus and other surface materials will be carried out in the area where future cassettes will be formed to a depth of 0.3-1.3 m, so that a uniform bottom elevation of 48 masl will be achieved,
  - the cleaned area will be well rolled by multiple passage of rollers and compactors, which will ensure sufficient compaction that mimics the mineral barrier and at the same time prevent damage to the film during installation,
  - a geomembrane made of high density polyethylene (HDPE) with a thickness of not less than 1.5 mm will be placed on the rolled surface, which meets the requirements of the Geosynthetic Research Institute (GRI) Testing method GM 13 “Testing methods, Test Properties and Testing Frequency for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes”3 or the relevant European standards (EN 134934) and recommendations,
  - a protective layer of geotextile, with a minimum mass of 200 g/m^2, will be placed on the geomembrane,
  - above the geotextile protective layer, a drainage and relief layer of gravel with a minimum thickness of 50 cm will be placed,
  - corrugated perforated drainage pipes Ø160 mm will be laid on the gravel, at a distance of 15 m from each other, and outlets made of solid pipes with a slope of 20%, which drains the drainage water from the contours of the landfill and drains it to the eastern, western and southern sides of the landfill into the drainage water collection pipelines, which are located on the outside of the stormwater collection channel.
  - The drainage pipes will be covered with a layer of gravel of at least 50 cm thickness, which will be wrapped with a layer of geotextile according to the detail shown in Figure 3.20.
  - drainage pipes are installed in the interior of the landfill up to a maximum length of 30 m, in order to maintain their structural strength, while further in the interior of the landfill a drainage layer of stone is formed at the same distance as the drainage pipes.
- In the southern part of the Landfill for non-hazardous waste complex, a unit for washing the wheels of trucks delivering waste, as well as the machinery used within the landfill, is planned. A standard washing facility for truck wheels, featuring high-pressure water with water recirculation, will be installed. When the washing water becomes contaminated, it will be pumped into an IBC container and transported to a plant for treatment.

- It is the obligation of the Project Holder to monitor the operation of the landfill in accordance with the proper technological procedure and legal obligations (Art. 26).
  1) monitoring of meteorological parameters;
  2) surface water monitoring
  3) monitoring of leachate;
  4) groundwater monitoring;
  5) monitoring the amount of rainwater;
  6) monitoring the stability of the landfill body;
  7) monitoring of protective layers;
  8) monitoring of pedological and geological characteristics.
- It is envisaged by the project that the monitoring will be carried out by sampling and measurement in the manner given in Appendix 6. – Monitoring the operation of the landfill, which is printed with the aforementioned regulation and forms an integral part thereof.
- Sampling and measurement will be carried out:

  1) in a laboratory where certain tests are performed daily;

  2) in an accredited laboratory at certain intervals prescribed by this Regulation or more frequently, if the data in the landfill laboratory show that there has been any accident situation or deviation from the parameters defined by the permit.

- All data obtained by monitoring shall be submitted as part of the regular annual reports that the Project Holder is obliged to submit to the Environmental Protection Agency.

8.4 Other measures that may affect the prevention or reduction of harmful effects on the environment:

- In order to improve the overall performance from the point of environmental protection, it is envisaged to establish and implement an Environmental Management System (EMS). The preparation of the Plant Management and Operation Manual (Management Handbook) is in progress, which will define all activities, precise environmental protection policy, waste management quality guarantee policy, organization, work protocols, working conditions, conditions and method of treatment of residues from the thermal treatment process, reporting, EMS, work procedures in emergency situations, etc.
- The qualified person responsible for professional work in the waste management plant, appointed by the authorized person of the Project Holder, is obliged to monitor the handling of non-hazardous and hazardous waste when performing waste storage and treatment activities, in accordance with the law governing waste management and other legal regulations.
- It is the obligation of the Project Holder to provide an adequate space at the site in which the documentation on the location, plant and records kept on the types and quantities of non-hazardous and hazardous waste in question are stored.
- The management of all technological processes will be carried out through the DCS system through which all process parameters (energy consumption, water consumption, waste quantities...) will be monitored; BMS system is envisaged as well, through which video surveillance, operation of ventilation systems (air conditioning) will be monitored.
- At the entrance to the non-hazardous and hazardous waste management plant at the location in Prahovo, a board should be placed with clearly visible information on the name and type of the waste management plant, types of non-hazardous and hazardous waste whose storage is carried out, working hours of the plant, as well as contacts of the owner or persons in charge of managing the plant.
- It is the obligation of the Project Holder to label non-hazardous and hazardous waste during storage in a way that ensures safety for human health and the environment and in accordance with the applicable regulations of the Republic of Serbia.
- Municipal waste generated during the regular operation of the facility shall be sorted, separating recyclable from non-recyclable types of waste. Provide containers for separate collection of waste and delivery of recyclables (pet packaging, paper, cardboard, metal, etc.) to authorized operators for further disposal. The collected non-recyclable substances should be treated in the boiler plant in question if they meet the prescribed conditions, otherwise they should be handed over to the authorized operator for further disposal. Collected non-recyclable materials should be handed over to an authorized operator for further disposal.
- Separated secondary raw materials during pretreatment of waste and treatment of slag from the boiler plant should be temporarily stored on the concrete plateau until they are handed over to authorized operators for further disposal (recycling).
- Waste stretch film, metal frames/grids removed from IBC containers/drums/jumbo bags before treatment, and damaged wooden pallets, which are considered non-hazardous waste (secondary raw materials), shall be temporarily stored in designated containers (metal containers etc.) on a concrete platform until they are handed over to authorized operators for recycling.
- The temporary storage of non-hazardous waste (separated secondary raw materials) provided in the open air is provided with a waterproof substrate from which all atmospheric water is collected and taken to the grease and oil separator.
- Packaging made of chemicals to be used at the plant in question should be used as returnable packaging or, if this is not possible, it should be referred for thermal treatment at the plant in question.
- All dust that is separated in the filtration process in the bag filter of the Waste Pretreatment Filter System and the Solidification filter system, should be collected in the associated bunkers and the screw conveyor, which is placed along the entire length of the bottom of the bunker, should be taken to the sector dispenser, which further inserts the material into the container provided for this purpose. The contents of the container should be emptied into one of the receiving waste bunkers and further referred for thermal treatment.
- After replacement, waste damaged filter bags should be treated in the boiler plant in question.

- Commercial waste generated due to daily activities in the office (paper, cardboard, staples, staples, wood in the form of disused chairs, tables, shelves, electrical and electronic equipment (telephones, computers, fax, printers ...) and other office supplies) should be sorted at the place of origin on paper and cardboard, PET, metal, wood that can be used as secondary raw materials and as such handed over to authorized operators for further treatment, and special waste streams should be disposed of in accordance with legal regulations.
- Within the complex in question, perform only temporary storage of waste generated during operation (overhauls, cleaning of process equipment, oil replacement, etc.) until its permanent disposal, which will be performed either within the boiler plant in question or by third parties, i.e. companies that have permits issued by the competent authority and that are registered to perform waste collection, transport, storage and/or treatment activities.
- Waste management generated during the regular operation of the plant should be carried out in accordance with the Waste Management Plan, which is periodically updated in accordance with the Law on Waste Management.
- Waste manipulation can only be performed by persons of the appropriate profession, trained and authorized for this type of work, dressed and equipped with proper equipment;
- The ammonia water transfer site (W-C13) is provided with a grate that will be connected to the collection pit in which any leaked contents will be collected during transfer. In this way, the possibility of possible leakage of the leaked fluid into the atmospheric sewage and the surrounding soil is avoided. The collected contents should be pumped into an IBC container and taken to a temporary storage of liquid waste materials from where, together with other liquid waste, they will be sent for thermal treatment.
- In addition to the area for transferring ammonia water, it is also planned to install a shower for the purpose of rinsing hands and eyes in case of pouring on the operator when discharging liquid waste (in case of an accident). The water from the shower flows into the aforementioned manhole.
- Below the HCl scrubber, a plastic bundwall basin is planned, and below the SO2 scrubber, a concrete containment basin for capturing any potential leaks during normal operation of the scrubber system or during maintenance of system components (e.g., pumps). A drain is provided in the bundwall and the water gravitationally flows into the general technological sewer, which is connected to the wastewater basin U-C06.
- Develop appropriate technical instructions and procedures for work in the facility;
- Establish grass and other green areas in a way that does not require the use of hazardous and harmful herbicides and pesticides, or requires their minimal and always controlled application.
- It is the obligation of the Project Holder to keep the waste management plant fenced and under constant supervision, in order to prevent access to unauthorized persons. The project envisages video surveillance of the entire plant.
- The ammonia water storage tank must be cooled in the summer months by spraying the process water. The water from the cooling of the tank should be collected in the associated bundwall, then taken to the collection basin located in the immediate vicinity of the tank, and then reused for cooling purposes, thus achieving water recirculation. If there is a possible contamination of the cooling water with ammonia water, it should be pumped into an IBC container /tank and sent first to the liquid waste storage, and then treated in the boiler plant together with other liquid waste.
- Given that leachate water is treated within the wastewater treatment plant of the Waste-to-Energy facility, any change in the quality of groundwater determined after analysis of samples taken from piezometers in Zones A, B, or C will be considered an emergency scenario requiring corrective action, including:
    - Physically introducing a hydraulic barrier to alter groundwater elevation and flow direction, aiming to prevent the flow toward the Danube River as close to the landfill location as possible.
    - Weekly verification of groundwater quality downstream during the period of the hydraulic barrier's existence.
    - Extraction of contaminated groundwater and its redirection to the wastewater treatment plant of the complex during the active measures of the hydraulic barrier.
    - Performing groundwater sample analyses to determine the nature of the occurrence, i.e., continuation of observation or notification of a one-time event and/or identification of the type of contamination with the appropriate mechanism for contaminant migration.

- Implementing a specialized program of mitigation measures after completing the groundwater sample analysis (physical, mechanical, or structural problems requiring maintenance work, induction of inert layers at specific landfill locations, introducing material layers with metal sorption properties, etc.).
- Restoring the connection of groundwater with the Danube River or inducing a permanent mechanical barrier for water flow in accordance with the specialized mitigation plan.

If there is a leakage of fuel or pollutants leading to soil contamination at the subject location and if the concentrations of pollutants, hazardous and harmful substances in the soil exceed prescribed remediation values, the project holder is obligated to:

- Notify the relevant Ministry of Environmental Protection as soon as possible.
- Perform soil testing and prepare a Remediation and Reclamation Project, obtaining approval from the competent authority. The Remediation and Reclamation Project may be prepared by a company, enterprise, or other legal entity authorized to design in the field of soil protection.
- Execute soil remediation and reclamation by engaging specialized companies/operators (using methods such as physical remediation, chemical remediation, biological remediation, phytoremediation, etc.).
- Submit a Report on the Completed Soil Remediation and Reclamation to the relevant Ministry of Environmental Protection within 30 days after the project's completion. The report must include:
  1. Data on the state of the soil before remediation or reclamation;
  2. A list of methods and standards used during remediation or reclamation;
  3. A list of materials used to achieve remediation or reclamation;
  4. Data on the state of the soil after completed remediation or reclamation;
  5. An evaluation of the effectiveness of the measures undertaken;
  6. A proposal for measures to maintain the achieved soil condition;
  7. Data on the registration and competence of the remediation and reclamation work contractors and the report's author.

8.4.1 Landfill closure method and procedure

- The surface of the landfill or one part thereof shall be closed when the conditions specified in the permit and the project for closing the entire landfill or one part thereof are met. When the designed elevations are reached, the closure reduces the effect of the open landfill immediately afterreaching the final elevations and reduces leachate and air pollution.
- As the landfill progresses in height, carry out the reclamation of the external slope by first placing a waterproof layer with a minimum thickness of 50 cm, followed by a 20 cm drainage layer of gravel, on top of which a 50 cm thick layer of humus must be applied. A geotextile with a minimum weight of 150 g/m² should be placed between the gravel and the humus layer. This will help prevent potential air pollution and slow down surface runoff, which can be significant in the case of greater landfill heights.
- After the completion of the exploitation period, it is the obligation of the Project Holder to close the landfill for further disposal by forming an upper covering layer that meets the following technical and technological requirements:

Measures applied in terms of the formation of the upper overlay	Landfill class
	For non-hazardous waste
Landfill gas drainage layer ≥ 0.3 m	not required *
Artificial waterproof lining - foil	not required
Impermeable mineral layer ≥ 0.5 m	required
Reclamation layer ≥ 0.5 m	required

*At the subject landfill for the disposal of non-hazardous waste / solid, non-reactive hazardous waste (solidified) whose leachate is equivalent to that for non-hazardous waste and which meets the limit values

of the parameters for the disposal of hazardous waste at landfills of non-hazardous, there will be no emissions of landfill gas. All chemical reactions in which hydrogen may be emitted, etc., will take place during the stabilization and solidification process, which takes place under strictly controlled conditions in the stabilization and solidification facility within the plant, and before the process of disposing of the solidificates at the landfill in question.

- For the reclamation layer, use compost or waste obtained through other biological treatment technologies, provided that it meets the concentration limits for waste disposal parameters.
- The landfill or part of the landfill shall be closed in accordance with the permit, when the conditions for closing the landfill are met or due to unforeseen circumstances that endanger the environment, in accordance with special regulations.
- After the closure of the landfill and until its final closure, the landfill operator (Project Holder) must take measures related to:
  (1) maintenance, supervision, control and monitoring of the landfill area, in accordance with the Regulation on the disposal of waste at landfills and the Law on Waste Management;
  (2) compiling a report on the state of the landfill for each calendar year and submitting it to the competent authority no later than 31st March for the previous calendar year;
  (3) reporting of irregularities determined by control and monitoring, which may adversely affect the environment, which shall be submitted to the competent institutions, within seven days from the date of determination.
- Measures to prevent or reduce environmental pollution shall be implemented by the Project Holder at its own expense and within the given deadline, in accordance with the Law on Waste Management.
- The landfill or a portion of it is considered finally closed for further disposal when all requirements of Article 24, Paragraph 2 of the Regulation on Waste Landfill Disposal are met, in accordance with the permit from the relevant authority regarding the cessation of landfill operations.

9.0. ENVIRONMENTAL IMPACT MONITORING PROGRAMME (MONITORING)

Environmental monitoring is the measurement of basic parameters, i.e. indicators of environmental quality. Based on the results of the measurements, the most appropriate measures can be taken in certain situations in order to preserve the quality of the environment.

The purpose of monitoring is not to identify undesirable levels of environmental pollution, but to warn in time that pollution may occur so that measures and activities can be taken to reduce negative impacts on the environment. Also, the purpose of monitoring is to warn in time of possible hazards due to possibly inadequate functioning of one of the elements of the system.

Obligations to monitor the state of the environment (monitoring) are defined by the Law on Environmental Protection ("Official Gazette of RS", No. 135/2004, 36/2009, 36/2009 - other law, 72/2009 - other law, 43/2011 - CC, 14/2016, 76/2018 and 95/2018 - other law); Under the provisions of this Law, the obligations are as follows:

- The Republic, the Autonomous Province and the local self-government unit, within their competencies, ensure continuous control and monitoring of the environment, as well as financial resources for monitoring. The Government shall determine the criteria for determining the number and arrangement of measuring points, the network of measuring points, the scope and frequency of measurements, the classification of phenomena to be monitored, the methodology of work and environmental pollution indicators and their monitoring, deadlines and the manner of data submission.
- A legal and natural person who is the owner or user of an installation that is a source of emission and environmental pollution, is obliged that, in accordance with Article 72 of the Law on Environmental Protection ("Official Gazette of RS", nos. 135/2004, 36/2009, 36/2009 - other law, 72/2009 - other law, 43/2011 - CC decision, 14/2016, 76/2018, 95/2018 - other law and 95/2018 - other law), through the relevant authority or authorized organization:
  - monitor emission indicators, i.e. indicators of the impact of their activities on the environment, indicators of the effectiveness of applied measures to prevent the occurrence or reduction of the pollution levels;
  - provide meteorological measurements for large industrial complexes or facilities of special interest to the Republic of Serbia, an autonomous province or a local self-government unit.
- The Government shall determine the types of emissions and other phenomena that are the subject of pollutant monitoring, the methodology of measurement, sampling method, the method of recording, the deadlines for submission and the requirements for data storage. The polluter plans and provides financial resources to perform emission monitoring, as well as other measurements and monitoring of the impact of its activity on the environment.

In accordance with the Law on Environmental Protection ("Official Gazette of RS", nos. 135/04, 36/09, 36/09 - other law, 72/09 - other law, 43/11 - decision of the CC and 14/16), and according to Article 72, the operator is obliged to monitor emission indicators, i.e. indicators of the impact of its activities on the environment and indicators of the effectiveness of applied measures for preventing the occurrence or reducing the level of pollution. The project holder is obliged to develop a monitoring plan, which will define the dynamics of monitoring and the type of pollutants to be measured. The Project holder shall submit the data on the performed monitoring to the competent authorities within the legally prescribed deadline.

9.1 An overview of the state of the environment prior to the commencement of the project operation in locations where environmental impact is expected;

An environmental impact monitoring program already exists at the location of the Elixir Prahovo industrial complex, and monitoring reports are regularly submitted to the competent authorities. As part of the monitoring, the following is carried out:

- Monitoring the emission of pollutants into the air;
- Air quality monitoring;
- Monitoring of wastewater, surface water and groundwater;
- Soil quality monitoring;
- Noise monitoring;
- Record and reporting on waste.

In order to define the state of the environment before the start of the project operation at the locations of the Waste-to-Energy Plant and the Landfill for non-hazardous waste, the study includes updated reports on the monitoring of the basic environmental factors at the location of the nearest existing Elixir Prahovo complex, as well as reports on targeted measurements of environmental factors at the locations in question prepared by authorized laboratories.

As part of the examination of the initial soil condition at the subject location and surrounding area during the period from privatization in 2012 to 2020, composite samples of the surface soil layer were taken, along with samples from deeper layers (from identified geological strata) down to the groundwater level. Some boreholes were used to install piezometers, from which water samples were taken for laboratory analyses. Considering the historical pollution data of the complex, characteristics of existing emitters, and types of pollutants, the Initial Conceptual Site Model (ICSM) was applied, which also considers potential pathways for pollutant migration.

The report, **"Analysis of Environmental Factors,"** provided as an annex to the study, analyzed results presented in the geotechnical reports of the Elixir Prahovo complex and other targeted laboratory tests, and it was concluded that:

- The pH values of the samples (water and soil) near the former pyrite cinder landfill are more acidic compared to the pH values of samples closer to the current phosphogypsum storage site;
- Groundwater levels fluctuate and directly depend on the Danube River's height, with a slight rise in levels closer to the riverbank;
- The organic matter content is highest in the surface soil layer;
- Slightly higher pollutant concentrations are registered in the surface layer and upper soil layers, down to the groundwater level;
- A marl-clayey complex appears at depths of over 15 meters and has a significant thickness estimated to exceed 12 meters. This complex serves as a hydrogeological barrier;
- Investigations have shown that higher concentrations of Ni are consistently present in the samples but at levels below the remediation values (RVs). This occurrence of Ni, regardless of the location and depth of samples, indicates the geological origin of this metal, which aligns with soil testing results at multiple other locations in Serbia;
- Elevated Co concentrations are likely a result of surface contamination that occurred during the period when phosphate with higher cobalt content was used in the phosphoric acid factory before privatization. Co concentrations in no sample exceed RV;
- Higher concentrations of pollutants were noted in the surface soil layer compared to deeper layers, particularly those of organic origin (hydrocarbons and pesticides above the limit values (LV), but below remediation values (RV)) in several samples taken from the Energy and Ecological Island Zone;
- Only one sample near the phosphogypsum storage, but outside the area designated for

constructing the Waste-to-Energy Plant and the Non-Hazardous Waste Landfill, showed As and Cu values > RV (Zone II). The increased concentrations of As and Cu were likely due to the prolonged deposition of pyrite cinder;

- Slightly higher concentrations of pesticides in Zone IV are probably the result of historical pollution caused by improper waste management from pesticide production, which has not been conducted at the complex for more than 15 years. The long half-life of the mentioned pollutants, increased concentrations of organic matter in the surface soil layer, and likely weaker leaching of soil by atmospheric agents contributed to the longer retention of pesticides in the soil. Due to the observed elevated concentrations of pesticides and hydrocarbons, no special interventions are required, apart from monitoring the condition of the soil and groundwater, especially during preparatory construction works for the facilities.

By analyzing the results of soil sample tests conducted in 2023 by the Institute for Prevention, Workplace Safety, Fire Protection, and Development LLC Novi Sad, "27. Januar" Branch Niš, it can be concluded that the results align with the corrected limit and remediation values prescribed by the Regulation on Limit Values of Polluting, Harmful, and Hazardous Substances in Soil ("Official Gazette of RS", No. 30/2018 and 64/2019), except for Cd, Cu, Ni, Zn, and Co, which do not align with the corrected limit values but are compliant with the corrected remediation values.

The results of groundwater testing from piezometers installed at the subject location and surroundings show that all tested parameter values align with the average annual concentrations prescribed by the Regulation on Limit Values of Polluting Substances in Surface and Groundwater and Sediment and Deadlines for Their Achievement ("Official Gazette of RS", No. 50/2012, Annex 2, Table 1) and groundwater remediation values prescribed by the Regulation on Limit Values of Polluting, Harmful, and Hazardous Substances in Soil ("Official Gazette of RS", No. 30/2018 and 64/2019, Annex 2).

Data on the quality of surface waters in Serbia, including the quality of the Danube River, is managed by the Environmental Protection Agency and is publicly available via the website www.sepa.gov.rs.

Results of physical-chemical, chemical, and microbiological analyses of samples, i.e., relevant parameter values for the annual period, were compared with the limit values of quality classes prescribed by the Regulation on Limit Values of Polluting Substances in Surface and Groundwater and Sediment and Deadlines for Their Achievement ("Official Gazette of RS", No. 50/2012), while the values of priority and priority hazardous substances were compared with the values of environmental quality standards (EQS), i.e., average annual concentration (AAC) and maximum allowable concentration (MAC) prescribed by the Regulation on Limit Values of Priority and Priority Hazardous Substances Polluting Surface Waters and Deadlines for Their Achievement ("Official Gazette of RS", No. 24/2014). According to the test results, water quality along the stretch from the dam to the border with Bulgaria occasionally does not meet the prescribed physical-chemical and microbiological quality standards.

In 2024, to determine the baseline quality of wastewater and surface water of the Danube River for the construction of the Eco Energy complex, the Institute for Prevention, Workplace Safety, Fire Protection, and Development LLC Novi Sad, "27. Januar" Branch Niš, conducted sampling and physico-chemical testing of wastewater and surface water quality at four measuring points.

The results of surface water testing from the Danube River upstream and downstream from the wastewater discharge point show that the concentrations of the tested parameters comply with the limit values prescribed by the Regulation on Limit Values of Polluting Substances in Surface and Groundwater and Sediment and Deadlines for Their Achievement ("Official Gazette of RS", No. 50/2012, Annex 1, Tables 1 and 3) and the Regulation on Limit Values of Priority and Priority Hazardous Substances Polluting Surface Waters and Deadlines for Their Achievement ("Official Gazette of RS", No. 24/2014, Annex, Table 1).

In previous years, the municipality of Negotin, including the settlement of Prahovo, was not covered by a network of stations for automatic air quality monitoring (AMSKV). Therefore, to present the baseline status, the City Institute for Public Health Belgrade, at the request of Elixir Prahovo LLC, conducted air

quality monitoring for 15 days from April 19th to May 3rd, 2023, at Measuring Point 1: Dragiša Brebulović-Žmiga, 11 Vuka Karadžića Street, Prahovo (N 44°17'40.6", E 22°35'9.5"). During the measurement period, the following parameters were tested:

- Mass concentrations of suspended particles PM10 and PM2.5;
- Total metal content (As, Cd, Pb, Ni, Cr) in the PM10 suspended particle fraction;
- Mass concentration of hydrogen fluoride (HF);
- Total phosphorus (P) content in the PM10 suspended particle fraction.

The measurement results show that all tested parameters comply with the Regulation on Conditions for Monitoring and Air Quality Requirements ("Official Gazette of RS", No. 11/2010, 75/2010, and 63/2013), except for one measurement (April 29, 2023) when the average 24-hour value of suspended particles PM10 (51 µg/m3) exceeded the limit value (50 µg/m3, which must not be exceeded more than 35 times in a calendar year).

The Institute for Prevention, Workplace Safety, Fire Protection, and Development LLC Novi Sad, "27. Januar" Branch Niš, also measured outdoor noise levels in May 2024 during the operation of IHP Elixir Prahovo's production facilities. The results show that the relevant noise levels at all measuring points DO NOT EXCEED the limit values for daytime, evening, and nighttime periods, meaning that the test results comply with the requirements of the aforementioned Regulation under regular operation of the IHP Elixir Prahovo complex.

Based on the above investigations, Chapter 5 of the Study provides a detailed depiction of the environmental baseline ("zero") status prior to the commencement of the projects in question.

9.2 Parameters for identification of adverse environmental effects

9.2.1 MONITORING OF THE WASTE-TO-ENERGY PLANT OPERATION

In terms of thermal waste treatment plants, the technical and technological conditions of measurement, emission limit values and their monitoring are defined by the Regulation *on technical and technological conditions for the design, construction, equipping and operation of plants and types of waste for thermal waste treatment, emission limit values and their monitoring ("Official Gazette of RS", No. 103/2023),* as well as *Conclusions on best available techniques for waste incineration (Commission implementing decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration (notified under document C(2019) 7987).*

Measuring equipment will be installed, using a method to monitor the parameters, operating conditions and mass concentrations that are relevant to the incineration process.

Monitoring shall be by measurement under the conditions and in the manner determined by the permit, in accordance with the law. The plant and the correct operation of automatic equipment for monitoring emissions into air and water are subject to annual control measurements.

Measuring devices used for emission measurement shall be calibrated and tested in accordance with the regulation governing the emission of pollutants into the air in relation to the half-hour mean value at least once a year, and their calibration and testing shall be performed by laboratories accredited for calibration and testing, in accordance with the prescribed standard.

Calibration and testing of measuring devices used for emission measurement will be carried out by comparative measurements by reference methods at least every third year, i.e. it is repeated after each

significant change (repair or modification of the meter).

The certificate of calibration and the report on the results of calibration and testing of the correctness of the device are envisaged to be submitted to the competent authority for the authorization of professional organizations for measurement within 60 days.

Measuring points shall be determined in accordance with the regulation governing the emission of pollutants into the air.

The correctness of the continuous emission measurement device shall be ensured in accordance with the regulation governing the emission of pollutants into the air.

Periodic (intermittent) measurements of emissions to air and water shall be carried out in accordance with Annexes 2 and 4. Regulation on technical and technological conditions for the design, construction, equipping and operation of plants and types of waste for waste thermal treatment, emission limit values and their monitoring ("Official Gazette of RS", No. 103/2023). The emission limit values for air and water are considered to be complied with if the conditions set out in the said Annexes 2 and 4 are met.

In addition to the aforementioned domestic legislation, the Commission implementing decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration (notified under document C(2019) 7987)) was used to define the monitoring of thermal waste treatment plants.

For the thermal waste treatment plant in question, the annual reporting shall also include data on the operation and monitoring of the plant and take into account the performance of the thermal treatment procedure and the level of emissions to air and water compared to the emission limit values and the submitted data to the competent authority shall be available to the public.

In accordance with all of the following, the monitoring program within the Waste-to-Energy Plant in question is given.

9.2.1.1 MONITORING OF POLLUTANT EMISSIONS INTO THE AIR

The study and monitoring of air quality aims to control and determine the degree of air pollution, as well as to determine the trend of pollution in order to act in a timely manner to reduce the emission of harmful substances to a level that will not significantly affect the quality of the environment.

The results of measurements of pollutant concentrations are compared with the prescribed emission limit values (ELVs), and on the basis of the performed analyses, the conditions and trends are determined to take appropriate air protection measures.

Air monitoring activities may be performed by professional organizations accredited as a testing laboratory, which meets the prescribed requirements and has the permission of the ministry responsible for environmental protection to perform air monitoring and/or emission measurement.

By implementing the project in question from point stationary sources of pollutants into the air, where monitoring of emissions into the air should be established, the following are:

- **Emitter of the boiler plant:** particulate matter, heavy metals, (Sb+As + Pb + Cr + Co + Cu + Mn + Ni+V), Cd + Tl, HCl, HF, SO_2, NOx, CO, NH_3, TVOC, PCDD/F, dioxins as PCBs and Hg);
- **Emitter of the Waste Pretreatment Filter System and Activated Carbon Filters:** particulate matter, TVOC, i.e. organic matter, expressed as total carbon and unpleasant odours;
- **Stabilization/solidification plant emitter:** particulate matter.

9.2.1.1.1 Monitoring of pollutant emissions from the boiler plant into the air

The largest and most technically complex part of the Waste-to-Energy Plant in Prahovo is the flue gas cleaning system created during the combustion of waste. These systems are designed on the basis of the defined chemical composition of the recipes of different types of waste entering the thermal treatment process and include: Waste gases generated by combustion of waste are first treated in cyclones where large particles are separated, and then in an activated carbon reactor that adsorbs heavy metals, dioxins and furans and a bag filter system where reacted particles are separated together with ash particles from the flue gas. Then dry cleaned gases are sent to the scrubber system where wet cleaning of gases and separation of chlorides, fluorides and heavy metals, as well as sulfur oxides are performed. The last stage of purification is in the DeNOx filter where nitrogen oxides (NO_x) are removed, after which the cleaned gases are discharged via a stack whose height is calculated in such a way as to protect human health and the environment (the height of the stack is 56 m in relation to the level 0).

Measurements of pollutant emission into the air from the thermal treatment plant shall be carried out in accordance with Annexes 2 and 3. Regulation on technical and technological conditions for the design, construction, equipping and operation of plants and types of waste for waste thermal treatment, emission limit values and their monitoring ("Official Gazette of RS", No. 103/2023) and the Conclusions on best available techniques for waste incineration (Commission Implementing Decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration):
1) **continuous measurement of:** nitrogen oxides (*NO_x*), ammonia (NH_3), carbon monoxide (*CO*), total particulate matter, total organic carbon (TVOC), hydrochloric acid (*HCl*), hydrofluoric acid (*HF*), sulfur dioxide (*SO_2*).

Note: For waste thermal treatment plants with a proven low and stable mercury content (e.g. monostreams of controlled composition waste), as is the case here, continuous monitoring of emissions can be replaced by long-term sampling (there is no EN standard for long-term mercury sampling) or periodic measurements with a minimum frequency once every six months. In the second case, EN 13211 is relevant.

2) **continuous measurement of the following process parameters:** temperature at the inner wall of the combustion chamber or at another representative point of the combustion chamber and/or additional combustion chamber, in accordance with the permit of the competent authority, as well as the volume fraction of oxygen, flue gas flow, pressure, temperature and water vapor content in the waste gases;

The gas retention time as well as the minimum temperature and oxygen content of the process gases shall be adequately checked, at least once, when the thermal treatment plant is put into operation and under the most unfavourable operating conditions expected.

3) **individual measurement** of the heavy metals concentration and metalloids (As, Cd, Co, Cr, Cu, Mn, Ni, Pb, Sb, Tl, V), dioxins and furans **at least twice a year**, whereby these measurements **in the first year of operation are performed at least four times a year with an interval of three months, as well as** benzo[a] pyrene once a year. Emissions during startup and shutdown, when waste is not being incinerated, including emissions of PCDD/F and dioxin-like PCBs, are estimated based on measurement campaigns conducted at regular intervals, such as every three years, during planned startup or shutdown operations.

Limit values for emissions of pollutants into the air from thermal waste treatment plants are prescribed in *Appendix 2. Regulation on technical and technological conditions for the design, construction, equipping and operation of plants and types of waste for waste thermal treatment, emission limit values*

and their monitoring ("Official Gazette of RS", No. 103/2023) and the *Conclusions on best available techniques for waste incineration* (Commission Implementing Decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration) as shown in Table 9.1 and 9.2.

Emission limit values are prescribed for dry waste gas, under normal conditions: T=273.15 K and P=101.3 kPa. The standard values are with an oxygen content of 11%, except in cases of incineration of mineral waste oil, in accordance with the regulation governing the management of waste oils, when the standard value is 3% of the oxygen content (formula given in Appendix 7. Regulation on technical and technological conditions for the design, construction, equipping and operation of plants and types of waste for waste thermal treatment, emission limit values and their monitoring ("Official Gazette of RS", No. 103/2023).

Table 9.1 Emission limit values of pollutant emissions into the air from waste thermal treatment plant

Emitter	Pollutant	Unit	Limit values in accordance with RS regulations[1]		BAT-AELs in accordance with BATC for WI[2]		Testing method acc. to BAT-AELs in accordance with BATC for WI[4]	Proposed limit values (LV) for the waste-to-energy plant subject to thermal treatment of waste[5]
			LV	Averaging period	BAT-AEL[3]	Averaging period		
Chimney after the DENOX filter Emitter height: 56 m relative to base level Internal diameter of the emitter at the top: 1.7 m Flue gas temperature at the emitter top: 147 ± 3°C Volume flow rate of flue gases through the emitter: 70.000 Nm³/h	Total particulate matter	mg/Nm³	10	Daily average value	< 2-5	Daily average value	General standard and EN 13284-2	**5**
			30	Average half-hour limit value for emissions 100%				
			10	Average half-hour limit value for emissions 97%				
			150	Total concentration expressed as a half-hour average				
	Cd+Tl	mg/Nm³	Total 0.05	Average value during sampling lasting at least 30 minutes and a maximum of 8 hours	0.005-0.02	Average value during the sampling period	EN 14385	**0.02**
	Sb+As+Pb+Cr+Co+Cu+Mn+Ni+V	mg/Nm³	Total 0.5	Average value during sampling lasting at least 30 minutes and a maximum of 8 hours	0.01-0.3	Average value during the sampling period	EN 14385	**0.3**
	HCl	mg/Nm³	10	Daily average value	< 2-6	Daily average value	General EN standards	**6**
			60	Average half-hour limit value for emissions 100%				

Emitter	Pollutant	Unit	Limit values in accordance with RS regulations[1]		BAT-AELs in accordance with BATC for WI[2]		Testing method acc. to BAT-AELs in accordance with BATC for WI[4]	Proposed limit values (LV) for the waste-to-energy plant subject to thermal treatment of waste[5]
			LV	Averaging period	BAT-AEL[3]	Averaging period		
			10	Average half-hour limit value for emissions 97%				
	HF	mg/Nm^3	1	Daily average value	< 1	Average daily value or average value during the sampling period	General EN standards	**1**
			4	Average half-hour limit value for emissions 100%				
			2	Average half-hour limit value for emissions 97%				
	SO_2	mg/Nm^3	50	Daily average value	5-30	Daily average value	General EN standards	**30**
			200	Average half-hour limit value for emissions 100%				
			50	Average half-hour limit value for emissions 97%				
	NOx (NO and NO_2 expressed as NO_2)	mg/Nm^3	200	Daily average value	50-120	Daily average value	General EN standards	**120**
			400	Average half-hour limit value for emissions 100%				
			200	Average half-hour limit value for emissions 97%				
	CO	mg/Nm^3	50	Daily average value	10-50	Daily average value	General EN standards	**50**
			100	Half-hour values				
			150	Average ten-minute value				
			100	Average hourly value (for fluidized bed furnaces)				
	NH_3	mg/Nm^3	-	-	2- 10	Daily average value	General EN standards	**10**
	TVOC	mg/Nm^3	10	Daily average value	< 3-10	Daily average	General EN standards	**10**

Emitter	Pollutant	Unit	Limit values in accordance with RS regulations[1]		BAT-AELs in accordance with BATC for WI[2]		Testing method acc. to BAT-AELs in accordance with BATC for WI[4]	Proposed limit values (LV) for the waste-to-energy plant subject to thermal treatment of waste[5]
			LV	Averaging period	BAT-AEL[3]	Averaging period		
			20	Average half-hour limit value for emissions 100%		value		
			10	Average half-hour limit value for emissions 97%				
	Dioxins and furans PCDD/F	ng I-TEQ/Nm^3	0.1	Average value during sampling lasting at least 6 hours and a maximum of 8 hours	< 0.01-0.04	Average value during the sampling period	EN 1948-1, EN 1948-2, EN 1948-3	**0.04**
					< 0.01-0.06	Long sampling period (limit value is not applied if emission stability is proven)		**0.06**
	Hg	µg/Nm^3	50	Average value during sampling lasting at least 30 minutes and a maximum of 8 hours	< 5-20	Average daily value or average value during the sampling period	General EN standard and EN 14884	**20**
					1-10	Long sampling period		**10**

1. The Regulation on Technical and Technological Conditions for the Design, Construction, Equipment, and Operation of Facilities and Types of Waste for Thermal Waste Treatment, Emission Limit Values, and Their Monitoring ("Official Gazette of RS", No. 103 of November 21, 2023), Annex 2, Tables:
   - Average daily limit values for the following pollutants;
   - Average half-hour limit values for the following pollutants;
   - Average emission limit values for the following heavy metals during sampling lasting at least 30 minutes and a maximum of 8 hours;
   - Average emission values for dioxins and furans during a sampling period of at least 6 hours and a maximum of 8 hours. The emission limit values apply to the total concentrations of dioxins and furans, calculated based on the toxic equivalence factors from Annex 1 of this regulation;
   - Emission limit values for carbon monoxide (CO) must not be exceeded in the case of combustion process gases;
   - The total concentration of particulate matter in emissions to the air from waste incineration facilities must not exceed 150 mg/Nm³, expressed as a half-hourly average. Emission limit values for gaseous or vapor organic substances, expressed as total organic carbon (TOC) from point 2, and carbon monoxide (CO) from point 5b of this annex must not be exceeded;
   - The competent authority may establish rules regarding exceptions granted for these values.

2. Conclusions on the Best Available Techniques for Waste Incineration: Commission Implementing Decision (EU) 2019/2010 of November 12, 2019, establishing the Best Available Techniques (BAT) Conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration;
3. New facilities;
4. General EN standards for continuous measurement are EN 15267-1, EN 15267-2, EN 15267-3, and EN 14181;
5. Proposed emission limit values according to BATC as stricter ELVs compared to the values prescribed by Serbian regulations. ELVs are finally determined as part of the process of obtaining an Integrated Pollution Prevention and Control Permit (IPPC), following the trial operation period of the facility, taking into account BATC concerning the demonstrated production process of the facility (after commissioning).

To determine the toxic equivalence (TE) of dioxins and furans, the mass concentrations of dioxins and furans are multiplied by the equivalent factors before summing, which are provided in Annex 1 of the Regulation on Technical and Technological Conditions for the Design, Construction, Equipment, and Operation of Facilities and Types of Waste for Thermal Waste Treatment, Emission Limit Values, and Their Monitoring ("Official Gazette of RS", No. 103/2023).

Equivalent toxicity factor		
2,3,7,8	- tetrachlordibenzodioxin (TCDD)	1
1,2,3,7,8	- pentachlorodibenzodioxin (PeCDD)	0.5
1,2,3,4,7,8 (HxCDD)	- hexachlorodibenzodioxin	0.1
1,2,3,6,7,8	- hexachlorodibenzodioxin (HxCDD)	0.1
1,2,3,7,8,9	- hexachlorodibenzodioxin (HxCDD)	0.1
1,2,3,4,6,7,8	- heptachlorodibenzodioxin (HpCDD)	001
	- octachlorodibenzodioxin (OCDD)	0.001
2,3,7,8	- tetrachlorodibenzofuran (TCDF)	0.1
2,3,4,7,8	- pentachlorodibenzofuran (PeCDF)	0.5
1,2,3,7,8	- pentachlorodibenzofuran (PeCDF)	0.05
1,2,3,4,7,8	- hexachlorodibenzofuran (HxCDF)	0.1
1,2,3,6,7,8	- hexachlorodibenzofuran (HxCDF)	0.1
1,2,3,7,8,9	- hexachlorodibenzofuran (HxCDF)	0.1
2,3,4,6,7,8	- hexachlorodibenzofuran (HxCDF)	0.1
1,2,3,4,6,7,8	- heptachlorodibenzofuran (HpCDF)	0.01
1,2,3,4,7,8,9	- heptachlorodibenzofuran (HpCDF)	0.01
	- octachlorodibenzofuran (OCDF)	0.001

In addition to regular monitoring of pollutant concentrations in accordance with the mentioned RS regulations and BATC, the project holder will also conduct additional annual monitoring of nitrous oxide (N_2O) concentrations, despite the fact that emission limits for this pollutant are not defined:

Pollutant	Testing method
Nitrous oxide (N_2O)	SRPS EN ISO 21258:2011
Benzo[a]pyrene	-

Measurement techniques related to air pollutants

1. Measurements made to determine the concentration of pollutants emitted into the air must be representative.

2. Sampling and analysis of all pollutants, including dioxins and furans, as well as reference methods for calibration of automatic measuring devices must be in accordance with international, regional or national standard methods, the application of which will provide data of equal quality.

3. At the level of daily emission limit values, the values of the 95% confidence interval for one result obtained by measurement must not exceed the following percentages of emission limit values:

Carbon monoxide	10%
Sulfur dioxide	20%

Nitrogen dioxide	20%
Total Particulate matter	30%
Total Organic Carbon	30%
Hydrochloric acid	40%
Hydrofluoric acid	40%

If the measurements show that the air emission limit values have been exceeded, the competent authority must be informed thereof without delay.

Extraordinary working conditions include the maximum allowable period of all technical unavoidable interruptions in operation, disturbances in operation, or malfunctions of treatment or measurement devices, the period during which concentrations from emissions to air and purified water may exceed the prescribed emission limit values. In the event of a malfunction, the operator of the thermal waste treatment plant shall reduce or completely suspend the activity as soon as possible until normal operation is restored.

The thermal treatment plant may in no case continue to operate for more than four hours without interruption if the emission limit values are exceeded, whereby the cumulative period of operation in such conditions must not exceed 60 hours during one year. The 60-hour period also applies to those lines in the plant that are connected to a single combustion gas treatment device. If emission limit values are exceeded, the waste incineration plant must under no circumstances incinerate waste for a maximum of four hours continuously from the moment of exceeding. The total duration of work under such conditions shall not exceed 60 hours during one year. The time limit applies to those furnaces that are connected to one individual waste gas treatment plant.

9.2.1.1.2 Monitoring of pollutant emissions into the air from the Waste Pretreatment Filter System and Activated Carbon Filters and the Filter system of the stabilization and solidification process

During the regular operation of the pretreatment plant (mechanical treatment) of waste to be thermally treated at the boiler plant in question, as well as during the unloading of waste, particulate matter, unpleasant odours and TVOC may be emitted (only when the organic compounds in question have been identified as relevant in the waste gas stream (BAT3[6]). In order to dedust and remove unpleasant odours, the air from the area where the unloading and pretreatment of non-hazardous and hazardous waste intended for energy generation is carried out will be conducted by means of a fan with a capacity of 24,000 m^3/h through a system of suction hoods and pipelines to the filter unit (W- C09 Waste Pretreatment Filter System and Activated Carbon Filter). The filter unit consists of a bag filter with pulsed shaking by compressed air, an activated carbon filter and an emitter (stack high 21.5 m).

All sources **of particulate matter emission into the air from the stabilisation/solidification process** are equipped with **bag filters** on which particulate matter is separated (ash mixture and thickened sediment storage bunker in which the stabilisation process takes place; mechanical treatment of slag or separation of ferrous metals using magnetic separators and non-ferrous metals using eddy current separators; mixer reactor in which the process of mixing cement, ash and water or the solidificates takes place; cement storage silo; cement weighing scale and ash weighing scale). The dedusting system consists of: exhaust shutters and hoods, pipelines, filter unit with accompanying equipment, centrifugal fan (capacity Q=25,000 m3/h, P=37 kW) and emitter (stack) 21.5 m high.

Limit values of emissions into the air for these emitters are prescribed by the Regulation on Limit Values of Emissions of Pollutants into the Air from Stationary Pollution Sources, except for combustion plants ("Official Gazette of RS", No. 111/2015 and 83/2021).

[6] Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing the best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU of the European Parliament and of the Council (notified under document C (2018) 5070) (Text with EEA relevance.)

In accordance with the Regulation on measurements of pollutant emissions into the air from stationary sources of pollution ("Official Gazette of RS", No. 5/16 and 10/24) and the Regulation on limit values for the emission of pollutants into the air from stationary sources of pollution, except for combustion plants ("Official Gazette of RS", No. 111/2015 and 83/2021) - Annex 1, Part VII WASTE TREATMENT PLANTS and OTHER MATERIALS, with the EXCEPTION OF THERMAL TREATMENT and BAT conclusions for waste treatment plants (Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU of the European Parliament and of the Council (notified under document C(2018) 5070) (Text with EEA relevance.) it is necessary to:

- On the emitter of the Waste Pretreatment Filter System and Activated Carbon Filters, measure the concentrations of particulate matter, TVOC or organic matter, expressed as total carbon;
- Measure the concentrations of particulate matter on the emitter of the stabilization/solidification plant.

At the specified point emission sources, periodically measure emissions **twice during the calendar year**, in accordance with legal regulations. One periodic measurement is performed in the first six calendar months, and the other periodic measurement in the second six ones.

Table 9.2 presents the emission limit values for air pollutants from the emitters of the waste pretreatment filter system and the activated carbon filter, as well as the stabilization and solidification process filter system.

[7] Regulation on Limit Values of Air Pollutant Emissions from Stationary Sources of Pollution, Except from Combustion Installations ("Official Gazette of RS", No. 111/2015 and 83/2021)

[8] Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing the best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU of the European Parliament and of the Council (notified under document C (2018) 5070) (Text with EEA relevance.)

Table 9.2 Emission limit values for pollutants in the air

Emitter		Pollutants	Unit	Limit values in accordance with RS regulations[1]	BAT-AELs in accordance with BATC for WT[3]	Ipsative method according to BAT-AELs in accordance with BATC for WI[2] / BAT for WT[3]	Proposed limit values (LV) for the waste-to-energy plant[4]
Emitter of the filter system of pre-treatment of waste and filters with activated carbon	Chimney after bag filter and activated carbon filter Emitter height: 21.5 m relative to base level Internal diameter of the emitter at the top: 1.2 m Flue gas temperature at the emitter top: ambient Volume flow rate of flue gases through the emitter: 24.000 Nm^3/h	Powdered substances	mg/Nm^3	10	2- 5	EN 13284-1	**5**
		TVOC	mg/Nm^3	-	10-30*	EN 12619	**30***
		Organic substances, expressed as total carbon	mg/Nm^3	20	-	-	**20**
Emitter of the filter system for the stabilization and solidification process	Chimney after the bag filter Emitter height: 21.5 m relative to base level Internal diameter of the emitter at the top: 1.2 m Flue gas temperature at the emitter top: ambient Volume flow rate of flue gases through the emitter: 25.000 Nm^3/h	Powdered substances	mg/Nm^3	10	2- 5	EN 13284-1	**5**

1. Regulation on technical and technological conditions for the design, construction, equipment, and operation of facilities and types of waste for thermal waste treatment, emission limit values, and their monitoring ("Official Gazette of RS", No. 103 of November 21, 2023).
2. Conclusions on the Best Available Techniques for Waste Incineration: Commission Implementing Decision (EU) 2019/2010 of November 12, 2019, establishing the Best Available Techniques (BAT) Conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration.
3. Conclusions on the Best Available Techniques for Waste Treatment: Commission Implementing Decision (EU) 2018/1147 of August 10, 2018, establishing best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU of the European Parliament and of the Council.
4. Proposed emission limit values according to BATC as stricter ELVs compared to the values prescribed by Serbian regulations. ELVs are finally determined as part of the process of obtaining an Integrated Pollution Prevention and Control Permit (IPPC), after the trial operation period of the facility, taking into account BATC relating to the demonstrated production process of the facility (after commissioning).
*BAT-AEL only applies when the organic compounds in question are identified as relevant in the waste gas stream, based on the inventory mentioned in BAT 3.

Reference methods prescribed in the Regulation on measurements of emissions of pollutants into the air from stationary sources of pollution (Official Gazette of RS, No. 05/2016 and 10/24) will be used for measurements of pollutant emissions and determination of measurement conditions.

In addition to the reference methods, other measurement methods may be used if their equivalence can be proven, i.e. if an equivalence test has been carried out in accordance with SRPS CEN/TS 15675.

Emission measurements will be carried out in accordance with the requirements and recommendations of SRPS EN 15259. Periodical emission measurements will be carried out twice during the calendar year with a mandatory gap of six months between the two measurements, one of which is periodical measurement in the first six calendar months, and the other periodical measurement in the second six calendar months.

Periodical measurements will be performed under operating conditions at the highest load of the stationary source of pollution.

Periodical measurements will be performed by an authorized professional organization to perform such measurements and in accordance with the Regulation on measurements of emissions of pollutants into the air from stationary sources of pollution (Official Gazette of RS, No. 05/2016 and 10/24).

The control of the operation of the waste gas treatment device will be carried out by the operator in accordance with the prescribed procedures in the plant.

If emission limit values are exceeded or accidents (uncontrolled release of pollutants into the air) occur, the operator is obliged to immediately inform the Republic Environmental Inspection.

All reports, in the prescribed form, must be available to the environmental inspection when inspecting the plant.

The operator is obliged to report to the Environmental Protection Agency on the monitoring of pollutants emitted into the air for the National Register of Pollution Sources by 31 March of the current year for the previous year in accordance with regulations.

After the start of production, it is necessary to first perform a warranty measurement, in order to compare the measured values of pollutant emissions with the emission limit values defined in Tables 9.1 and 9.2.

Warranty emission measurement is carried out in the period between the third and sixth month from the beginning of the trial operation of the stationary source of pollution in the process of obtaining a certificate of occupation in accordance with the law governing the construction of facilities. Warranty measurement is performed under operating conditions at the highest load of the stationary source of pollution.

9.2.1.2 AMBIENT AIR QUALITY TESTING

The impact on air quality in the subject area will be based on the monitoring of ambient air quality as stated above.

Currently, in accordance with the adopted environmental monitoring plan and program, the operator Elixir Prahovo performs monitoring of ambient air quality in the vicinity of the subject location through an authorized accredited laboratory of the City Institute for Public Health Belgrade. Air quality monitoring is carried out **once a year for 15 days at the** measuring point 1: Dragiša Brebulović-Žmiga, 11 Vuka Karadžića Street, Prahovo (N 44°17'40.6", E 22°35'9.5 "), which is about 2.5 km northwest of the location of the Waste-to-Energy Plant and Landfill for non-hazardous waste. The tests include monitoring of the following parameters:

- Mass concentrations of suspended particles PM_{10} and $PM_{2,5}$;
- Total content of metals (As, Cd, Pb, Ni, Cr) in fraction of suspended particles PM_{10};
- Hydrogen fluoride (HF) mass concentration;

- Total content of phosphorus (P) in fraction of suspended particles PM_{10}.

The analysis of the pollutants concentration in the air results, in the impact zone in relation to the maximum allowable concentration, was carried out in accordance with the Regulation on monitoring conditions and air quality requirements ("Off. Gazette of RS" No.75/10, 11/10 and 63/13): Appendix XV-Section A- Maximum allowable concentrations (the report on the air quality testing is attached to the Study).

Based on the results of the Report on the conducted public consultations in the implementation of the projects for the construction of the Waste-to-Energy Plant in Prahovo, a strategic and systematic approach to future long-term interactions between investors and the local community regarding the operation of the Waste-to-Energy Plant has been defined through consultations with citizens.

In addition to the conducted consultation, the need to donate an **automatic measuring station to the municipality of Negotin** was recognized (attached is the Agreement on Donation of automatic measuring station addressed to the municipality of Negotin, signed on 26 June 2024). The automatic measuring station would be part of the network of the Environmental Protection Agency, at whose initiative an adequate location would be defined and relevant parameters for measurement would be determined.

In accordance with the above, in the Environmental Protection Agency, a meeting was held in mid-April, attended by the President of the Municipality of Negotin and representatives of the Elixir Foundation. On May 13, the Head of the Monitoring Group of the Environmental Protection Agency, the representative of Urbanism of the Municipality and the representative of the Elixir Foundation visited 6 potential locations in Negotin, after which the representative of the Agency selected the location of the PU “Pčelica” /in the centre/. Representatives of urbanism and the ‘Negotinci in Action’ association were also introduced to all of the above. The automatic measuring station in Negotin has become part of the national network of the Environmental Protection Agency, where continuous monitoring is conducted for SO_2, NOx, and NH_3, measurement of suspended particles PM10/PM2.5, ground-level ozone measurement, meteorological parameters, benzene, toluene, ethylbenzene, xylene measurement, and continuous CO monitoring.

In this way, the legal obligation will be fulfilled and the continuous monitoring of air quality will be carried out by the Environmental Protection Agency along with the provision of accurate and updated environmental data to the local community, which would further improve the transparency and efficiency of environmental monitoring in real time and restore citizens' confidence in reporting process.
Continuous monitoring of air quality will enable the local community to monitor the state of the environment in real time, which will increase the transparency and accountability of investors. Citizens will have access to updated air quality data, which is displayed on publicly accessible platforms, allowing citizens to monitor air quality in their community. Also, information can be integrated into smartphone apps that provide alerts and recommendations in case of high concentrations of pollutants. For example, citizens may be informed to avoid outdoor activities when air quality is poor.

This initiative would also contribute to building trust between the local community and investors, as citizens could directly monitor the potential impact of the Waste-to-Energy Plant on air quality in the municipality of Negotin. Transparency of air quality data and openness to citizen feedback will create a sense of involvement and partnership, which is key to long-term success.

If during the testing it is shown that certain pollutants exceed the allowable values, which originate from

the production process of the Waste-to-Energy Plant or from the Landfill for non-hazardous waste, it should perform measures to reduce such pollutants to the prescribed limits.

Besides aforementioned and based on the consultations with the public, it was concluded that, in addition to the monitoring of air quality, it is necessary to establish a kind of **civil control** that is in accordance with the best practices of similar plants in the European Union, thus guaranteeing that the operation of the plant remains transparent, responsible and compliant with high environmental and social standards.

This model works by providing citizens with access to real-time air quality data through online platforms. This approach enables citizens to be actively involved in environmental monitoring and to react in a timely manner to possible changes in air quality.
Such systems not only increase the transparency of environmental measures, but also encourage greater participation of citizens in local environmental initiatives.

9.2.1.3 WASTEWATER QUALITY MONITORING

In accordance with the Law on Waters ("Official Gazette of RS", No. 30/2010, 93/2012, 101/2016, 95/2018 and 95/2018 - other law), and the Rulebook on the manner and conditions for measuring and testing the quality of wastewater and their impact to the recipient and the content of the report on the performed measurements ("Official Gazette of RS", No. 18/2024), APPENDIX 1 - TECHNICAL CONDITIONS for the IMPLEMENTATION OF MONITORING, it is the obligation of the water treatment plant owner, in this case the Project Holder, to monitor wastewater before and after their treatment through a legal entity authorized for wastewater testing or independently if the conditions are met.

Rulebook on the method and conditions for measuring the amounts and examination of the quality of wastewater and its impact on the recipient and the content of the report on the measurements performed ("Official Gazette of RS", No. 18/2024), wastewater monitoring is prescribed, which includes measuring the amount and testing the quality of wastewater, which aims to provide information and necessary data on the amounts of wastewater, concentration and mass flow of pollutants in wastewater and treated wastewater.

The frequency of measuring the amount and testing the quality of wastewater is performed in accordance with the dynamics of wastewater generation and the applied methods for their treatment or pretreatment, based on the regulations governing ELV and in accordance with APPENDIX 2. WASTEWATER SAMPLING, item 3, Minimum number of sampling in periodic measurements, of the said Rulebook.

The purpose of measuring the amount of wastewater and testing its quality is to:

1. verify compliance with the emission limit values for pollutants into water (ELV) and the efficiency of the wastewater treatment plant;
2. determine the impact of discharged wastewater on the receiver (recipient) and
3. collect data for keeping national registers in accordance with regulations in the field of water and environmental protection.

A legal entity or entrepreneur that discharges wastewater into the recipient in accordance with the law governing water shall monitor wastewater in accordance with the technical conditions for conducting monitoring, through a legal entity authorized for wastewater testing or independently if it meets the conditions in accordance with the law governing water.

Monitoring includes:

1. Measurement of wastewater flow during sampling at a given measuring point, i.e. measurement of wastewater amount;
2. Sampling of wastewater for the purpose of their examining;
3. Measurements and examinations carried out in the field, such as: water and air temperature; pH value of wastewater during the sampling period, content of oxygen, barometric pressure, electrical conductivity, appearance (presence of oil droplets, rags, hairs, etc.), precipitants, odour, change of colour;
4. Preparation, transport and storage of wastewater samples;
5. Examination of basic and specific physico-chemical and chemical parameters that include both eco-toxicological parameters and microbiological analysis of wastewater;
6. Preparation of reports on performed measurements.

In addition to the aforementioned activities, monitoring also includes:

1) Collection of data on the conditions for conducting monitoring in accordance with Annex 1 of the aforementioned rulebook, as well as calculations;
2) Calculation of the average value of the emission of polluting substances, heat emission (if the temperature of the wastewater exceeds the prescribed threshold value for the recipient), the annual amount of wastewater in accordance with Annex 3 - Calculation of the average value of the parameters;
3) Calculation of emitted pollutants (wastewater load) in accordance with Annex 4 - Calculation of wastewater load;
4) Calculation of the mass balance of wastewater in accordance with Annex 5 - Calculation of the mass balance;
5) Calculation of the emission factor in accordance with Annex 6 - Emission factors;
6) Calculation of the efficiency of wastewater treatment for certain parameters.

In accordance with regulations, wastewater monitoring can be carried out:

1. **continually**- when a 24-hour measurement of the amount of wastewater, basic and specific parameters of wastewater quality is carried out, in accordance with the regulation governing ELV and/or water permit or integrated permit, especially in the case where wastewater contains hazardous substances;
2. **periodically**- in cases where wastewater is generated and discharged periodically at regular time intervals during the year or during seasonal operation if wastewater is not discharged throughout the calendar year. In this case, a 2-hour or current sample is taken and the amount of wastewater measured during sampling, as well as the testing of basic and specific parameters in accordance with the regulation governing ELV and/or water and integrated permit.

The measuring point must be equipped and arranged as follows:

1. to provide the sampler with access to a sufficiently wide shaft, climbers or ladders and with sufficient space at the bottom of the shaft, to enable the work of the sampler, if the equipment cannot be mounted from the top of the shaft;
2. to enable the installation of appropriate equipment for sampling and for the possibility of field measurement;
3. to allow flow measurement, if the measuring equipment is installed elsewhere, but is connected to the sampling point so as to allow simultaneous sampling and flow measurement. In the event that this is not possible, a laminar flow must be provided at the measuring point, whereby the length of the flat part of the supply pipe in front of the measuring point must be at least ten times the diameter of the pipe;
4. that a sufficient depth of wastewater (at least 5 cm) is provided at the measuring point to allow the use of an underwater probe (sensor) for measuring or installing a suction pipe for sampling;

Sampling of treated and/or untreated wastewater will be done by taking a composite or instantaneous sample depending on the dynamics of wastewater discharge.

The basic parameters of the wastewater to be tested are: flow (minimum, maximum and mean daily),

air temperature, water temperature, barometric pressure, colour, odour, visible substances, sediment matter (after 2h), pH value, BOD_5, COD, oxygen content, dry residue, annealed residue, annealing loss, suspended matter and electrical conductivity.

In addition to the above basic parameters, testing **of certain groups or categories of pollutants prescribed for technological and other wastewater** that is directly discharged into the recipient will be performed (in accordance with the *Regulation on Emission Limit Values for Pollutant into Water and Deadlines for Their Reach* ("Official Gazette of RS", No. 67/2011, 48/2012 and 1/2016), as well as parameters related to emissions from wastewater treatment from the waste gas treatment process generated in the incineration plant (in accordance with the *Regulation on technical and technological conditions for the design, construction, equipment and operation of plants and types of waste for waste thermal treatment, emission limit values and their monitoring* ("Official Gazette of RS", No. 103/2023).

In accordance with the characteristics of wastewater generated and discharged into the recipient, it is the obligation of the Project Holder to perform regular monitoring of wastewater quality:

- **after treatment at the boiler plant wastewater treatment plant**: total suspended solids (TSS), total organic carbon (TOC), metals and metalloids (As, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Tl, Zn, Mo), ammonium-nitrogen (NH_4-N), sulfates (SO_4^{2-}) and PCDD/ F, chlorides;
- **before and after treatment on the grease and oil separator:** temperature, pH value, biochemical oxygen demand (BOD_5), chemical oxygen demand (COD), hydrocarbon index.

9.2.1.3.1 Monitoring of wastewater from the boiler plant

The wastewater generated in the wet gas washing processes is treated by a physical and chemical process of three-stage neutralization with the precipitation of heavy metals in the wastewater treatment plant of the emitter (under the license of Envirochemie (ECWWT), after which the quality of the treated water is achieved, which is in accordance with domestic and EU regulations. Cleaned water is supplied from this plant to chamber 2 of the wastewater tank U-C06 whose main role is to accept them **in order to perform their testing before discharge to the recipient**. The maximum flow of treated wastewater from the boiler plant is 10 m^3/h.
In order to facilitate manipulation and possible response in the event that the water quality does not correspond to the required quality for discharge into the recipient, chamber 2 is divided into 4 identical parts (subchambers 2a, 2b, 2c, 2d). The volume of each part, i.e. each subchamber, is 80 m^3, which is enough for each subchamber to accept wastewater for a period of 8 hours. After that, the wastewater from the sub-chamber in question is sampled and the quality parameters are tested. In this way, it is possible for each batch of 80 m^3 to be analysed before discharge. By dividing chamber 2 into smaller segments, a semi-batch method of wastewater treatment management is enabled, in order to have time to perform complete physico-chemical analyses. The maximum duration of the analysis is 8 hours, and then the water can be discharged in an appropriate manner, depending on the analysis results. If the analyses show that the waters have a satisfactory quality for discharge into the final recipient, they are gravitationally discharged first into subchamber 2e, which is intended to function as a common channel, i.e. the wastewater pool purified water collector U-C06. From subchamber 2e, the treated water is gravitationally transported to the manhole (pumping station) for pumping the treated water to the Central collector of clean water of the industrial complex Elixir Prahovo, which flows into the natural recipient – the Danube River.
If the water quality is not satisfactory for discharge into the recipient, water is transported to the chamber 3 of the U-C06 basin, from where contaminated water is sent to the wastewater treatment plant by filtration (sand filter column and activated carbon column) located within the U-C02 facility Maintenance

building and auxiliary systems facility. After the treatment on the filter plant, the water is once again sent for re-treatment to the wastewater treatment plant from the boiler plant (ECWWT). If the water quality is not satisfactory for discharge into the recipient, the water is transported to chamber 3 of the basin U-C06. This can be done through gravitational discharge via chamber 2e by closing one valve and opening another. If chamber 3 already contains a certain amount of water, making gravitational discharge unfeasible, it is planned to transport wastewater of unsatisfactory quality from sub-chambers 2a, 2b, 2c, or 2d to chamber 3 using a mobile submersible pump. From chamber 3, contaminated water is sent to the wastewater treatment plant for filtration (a column with a sand filter and a column with activated carbon), located in building U-C02 Maintenance Building and Auxiliary Systems Facility. After filtration treatment, the water is directed for further purification to the boiler plant wastewater treatment facility (ECWWT) in building W-C11.
In emergency situations when it is known that excessive pollution or contamination of wastewater has occurred, it is possible to pump those from chamber 3 into chamber 4. At the bottom of chamber 4, submersible pumps are installed by which the wastewater from chamber 4 is transported to the liquid waste storage tanks in facility W-C08 and further for thermal treatment to the boiler plant.

Limit values for emissions of pollutants at discharging wastewater from the waste gas treatment system of the incineration plant are prescribed IN *APPENDIX 4. LIMIT VALUES FOR EMISSIONS OF POLLUTANTS IN WASTEWATER FROM THE WASTE GAS TREATMENT PROCESS GENERATED IN THE INCINERATION PLANT AND CO-INCINERATION OF WASTE, Regulation on technical and technological conditions for the design, construction, equipping and operation of plants and types of waste for waste thermal treatment, emission limit values and their monitoring ("Official Gazette of RS", No. 103/2023).*
Emission limit values shall be applied at the point where the wastewater generated in the waste gas treatment process, containing the pollutants referred to in Annexes 2 and 3 of the said Regulation is discharged, i.e. at the point where the cleaned process water from the receiving basin is discharged into the collector of wastewater from the Waste-to-Energy Plant.

In addition to domestic legislation to define the monitoring of *wastewater from the waste gas treatment system of the incineration plant*, the Conclusions on best available techniques for waste incineration BATC (Commission implementing decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration (notified under document C(2019) 7987)) were also used.

Regulation on technical and technological conditions for the design, construction, equipping and operation of plants and types of waste for waste thermal treatment, emission limit values and their monitoring ("Official Gazette of RS", No. 103/2023), the following measurements are performed at the wastewater discharge point:
1) **continuous measurement** of the parameters referred to in the aforementioned Annex 4 of the Regulation;
2) **individual daily measurement** of total suspended solids;
3) **monthly measurement** also on a representative sample of discharged waters during 24 hours, i.e., pollutants in connection with Annex 4 of the Regulation;
4) **measurements of dioxins and furans every six months** (in the first year of operation, it is recommended to measure at least four times a year with an interval of three months).

Table 9.3: Emission limit values for pollutants in wastewater discharge from the flue gas treatment system of the thermal treatment plant

Parameter		Process	Unit of measure	BAT-AELs in accordance with BATC for WI[1]	Averaging time	LV expressed as mass concentrations of unfiltered samples in accordance with RS[2] regulations		Testing method in accordance with BATC for WI[1]	Minimum monitoring requirement	Proposed LV for wastewater discharge from the flue gas cleaning system of the waste thermal treatment plant related to the Waste-to-Energy Plant on waste[3]
						95 % measured values	100 % measured values			
Total suspended solids (TSS)		FGC Bottom ash treatment	mg/l	10-30	Random sampling	30	45	EN 872	Once a day	30
Total Organic Carbon (TOC)		FGC Bottom ash treatment		15-40	Daily average value or 24-hour composite samples proportional to flow Composite sampling proportional to time can be applied, provided sufficient flow stability is proven	-		EN 1484	Once a month	40
Metals and metalloids	As	FGC		0.01-0.05		0.15		Different EN standards (e.g. EN ISO 11885, EN ISO 15586 or EN ISO 17294-2)	Once a month	0.05
	Cd +Tl	FGC		0.005-0.03		0.05				0.03
	Cr	FGC		0.01-0.1		0.5				0.1
	Cu	FGC		0.03-0.15		0.5				0.15
	Hg	FGC		0.001-0.01		0.03		Different EN standards (e.g. EN ISO 12846 or EN ISO 17852)		0.01
	Ni	FGC		0.03-0.15		0.5		Different EN standards (e.g. EN ISO 11885, EN ISO 15586		0.15
	Pb	FGC		0.02-0.06		0.2				0.06

Parameter		Process	Unit of measure	BAT-AELs in accordance with BATC for WI[1]	Averaging time	LV expressed as mass concentrations of unfiltered samples in accordance with RS[2] regulations		Testing method in accordance with BATC for WI[1]	Minimum monitoring requirement	Proposed LV for wastewater discharge from the flue gas cleaning system of the waste thermal treatment plant related to the Waste-to-Energy Plant on waste[3]
						95 % measured values	100 % measured values			
	Sb	Bottom ash treatment		0.02-0.9		-		or EN ISO 17294-2)		0.9
	Tl	FGC		0.005-0.03		0.05				0.03
	Zn	FGC		0.01-0.5		1.5				0.5
Dioxins and furans PCDD/F		FGC	ng I-TEQ/I	0.01-0.05		0.3		No EN standards	Once a month (in the case of stable results, measurement can be done once every six months).	0.05

1. Conclusions on Best Available Techniques: Commission Implementing Decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration (notified under document C(2019) 7987).

2. Regulation on technical and technological conditions for designing, constructing, equipping, and operating plants and types of waste for thermal waste treatment, emission limit values, and their monitoring ("Official Gazette of RS," No. 103 dated 21 November 2023).

3. Proposed emission limit values according to BATC (Best Available Techniques Conclusions) are stricter ELVs (Emission Limit Values) compared to the values prescribed by RS regulations. ELVs are finally defined as part of the process for issuing an Integrated Pollution Prevention and Control (IPPC) permit after the plant's trial operation period, taking into account the BATC related to the demonstrated production process of the plant (after commissioning).

Monitoring of the pollutants concentration in wastewater shall be carried out in the manner and within the deadlines established in accordance with the regulations governing water quality management and the issued permit.

If the measurements show that the air emission limit values have been exceeded, the competent authority must be informed thereof without delay.

In accordance with the characteristics of the wastewater that is generated and discharged into the recipient, it is the responsibility of the Project Holder to carry out regular monitoring of the quality of wastewater after treatment at the wastewater treatment plant of the boiler plant: total suspended matter (TSS), total organic carbon (TOC), metals and metalloids and (As, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Tl, Zn, Mo) and PCDD/ F.

Figure 9.1 shows a schematic view of the wastewater flows and the U-C06 wastewater basin.

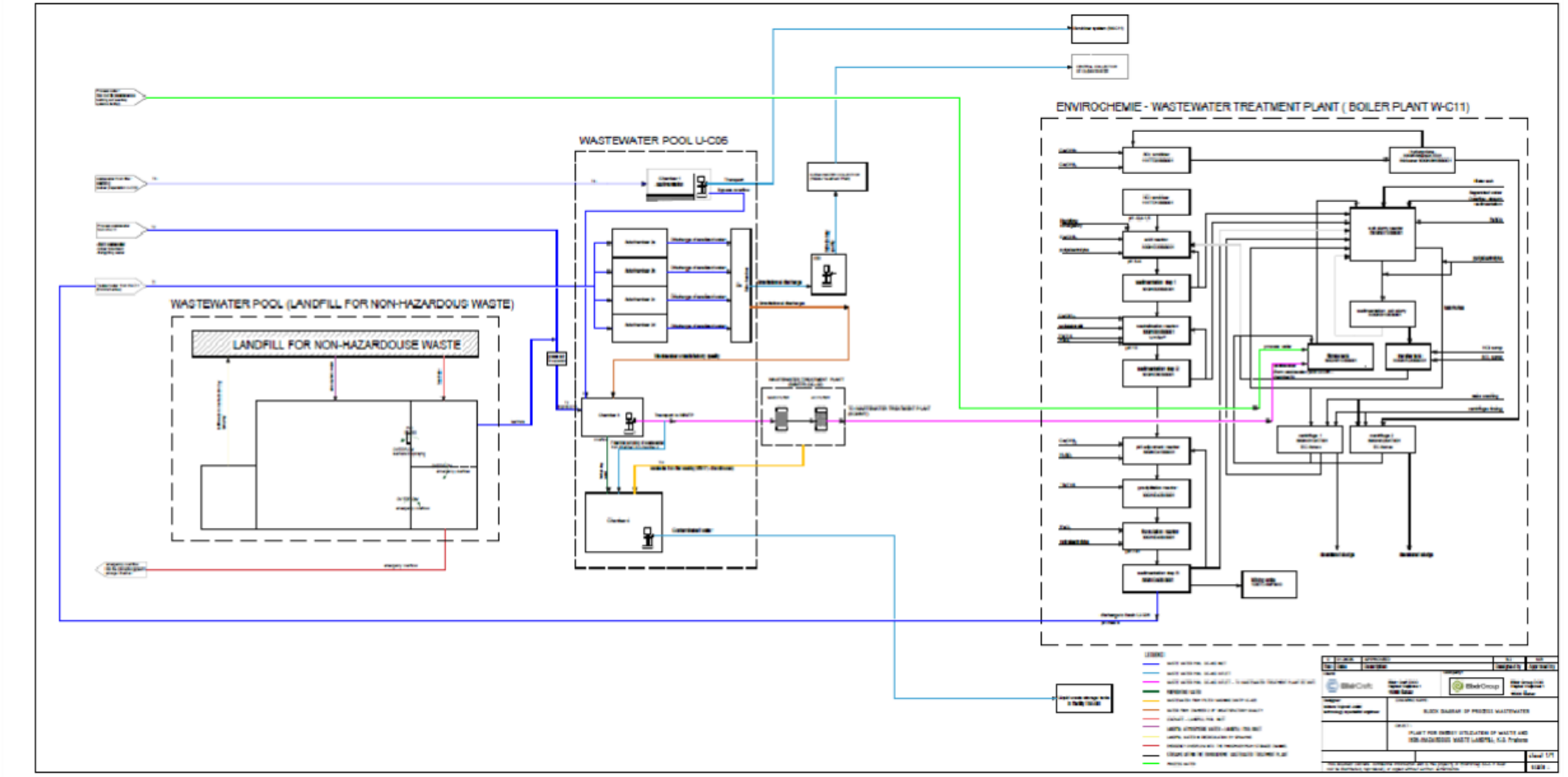


Figure 9.1 Schematic view of the wastewater flows and the U-C06 wastewater basin

9.2.1.3.2 Monitoring of atmospheric wastewater

During the regular operation of the plant in question, atmospheric (potentially polluted) wastewater will be generated. For the purpose of treating oily atmospheric water from manipulative surfaces, roads and parking lots, two "by pass" separators of petroleum products are planned, made and tested according to SRPS EN 858, rated size NS10/100 (flow through the separator 10 l/s while the max flow is 100 l/s) and rated size NS15/150 (flow through the separator 15 l/s while the max flow is 150 l/s). The efficiency of separating light petroleum products - light liquids in the separator outlet water is up to 5 mg/l. So cleaned oily sewer is connected to the conditionally clean rainwater sewer and conducted to the drainage Central collector for the entire Elixir Prahovo complex, and through it it is discharged into the Danube.

Wastewater quality control will include regular analyses of samples of potentially polluted atmospheric wastewater, before and after their treatment on the separator of petroleum products. Wastewater quality testing **will be carried out 4 times a year** in accordance with Article 99 Law on Waters (Official Gazette of RS, No. 30/10 and 93/2012) and in accordance with the Rulebook on the method and conditions for measuring the amounts and examination of the quality of wastewater and its impact on the recipient and the content of the report on the measurements performed ("Official Gazette of RS", No. 18/2024) and the Regulation on Limit Values of Pollutant Emissions into Water and Deadlines for Reaching Them ("Official Gazette of RS", nos. 67/2011, 48/2012 and 1/2016);

When sampling, preparing samples, storing and storing them, handling samples, as well as during field testing and analysis of wastewater samples, reference methods as required by standard SRPS ISO/IEC 17025 will be applied.

The quality of wastewater discharged into the recipient (Danube River) must correspond to the values prescribed by the Rulebook on the method and conditions for measuring the amounts and examination of the quality of wastewater and its impact on the recipient and the content of the report on the measurements performed ("Official Gazette of RS", No. 18/2024) and the Regulation on Limit Values of Pollutant Emissions into Water and Deadlines for Reaching Them ("Official Gazette of RS", No. 67/2011, 48/2012 and 1/2016, Appendix 2, 19. Emission limit values for wastewater; II Other wastewater; Section 4. Limit values for the emission of wastewater containing mineral oils.

Table 9.4 provides emission limit values at the point of discharge into surface waters.

Table 9.4 Emission limit values at the point of discharge into surface waters(II)

Parameter name	Unit	Limit value(I)	Testing method
Temperature	°C	30	EPA Method 150.1:1982
pH		6.5-9	EPA Method 170.1:1974

Biochemical Oxygen Demand (BOD_5)	mgO2/l	40	EN 1899
Chemical Oxygen Demand (COD)	mgO2/l	150	EPA Method 410.1:1978
Hydrocarbon index	mg/l	10	EN ISO 9377-2

(l) The values refer to a two-hour sample.

In accordance with the characteristics of the generated wastewater and discharge of them into the recipient, it is the responsibility of the Project Holder to perform regular monitoring of the quality of wastewater before and after treatment at the grease and oil separator: temperature, pH value, biochemical oxygen demand (BOD_5), chemical oxygen demand (COD), hydrocarbon index.

9.2.1.3.3 Monitoring the quality of sanitary foul wastewater after biological treatment

Waste-to-Energy Plant's foul sewerage system will collect all sanitary-foul wastewater and carry it to the treatment plant (mechanical and biological treatment). A buried biological purifier type ACO-INTERPLAN BIOTIP kup 20ES with technology of continuous recirculation of activated sludge with a capacity of 20 PE (40 employees), hydraulic load 3 m3/day, biological load BOD: 1.2 kg/day, intended for biological treatment of sanitary waste water. Cleaned wastewater will be connected to the shaft of conditionally clean rain sewerage, which will be connected to the collector of all clean and purified water of the Elixir Prahovo complex, through which the water is discharged into the recipient - the Danube River.

In accordance with the Regulation on Emission Limit Values for Pollutants into Water and Deadlines for Their Achievement ("Official Gazette of RS," Nos. 67/2011, 48/2012, and 1/2016), III municipal wastewater, Table 2. Emission limit values for municipal wastewater discharged into the recipient, the quality of water after treatment must meet the criteria given in Table 9.5.

Table 9.5 Emission limit values

Parameter	**LV1**	**Unit**
Biochemical Oxygen Demand (BOD5): 2.5, 6	**25** **403**	**mgO2/l**
Chemical Oxygen Demand (COD): 5	**125**	**mgO2/l**
Total Suspended Solids (TSS): 4.7	**35 (over 10 000 EC)** **60(2000 to 10 000 EC)**	**mg/l**

1. In accordance with the Regulation on Emission Limit Values for Pollutants into Water and Deadlines for Their Achievement ("Official Gazette of RS," Nos. 67/2011, 48/2012, and 1/2016).
2. The parameter can be replaced by another parameter: Total Organic Carbon (TOC) or Total Chemical Oxygen Demand (CODTotal), if a correlation between BOD5 and these parameters can be established.
3. If it is proven that discharged wastewater after treatment will not negatively impact the watercourse quality.

4. Suspended solids are not a mandatory parameter.
5. Homogenized, unfiltered, undecanted sample.
6. Addition of nitrification inhibitor.
7. Filtration of a representative sample through a 0.45 μm membrane filter. Drying at 105 ˚C and weighing.

In accordance to the Rulebook on the method and conditions for measuring the amounts and examination of the quality of wastewater and its impact on the recipient and the content of the report on the measurements performed ("Official Gazette of RS", No. 18/2024) the frequency of measuring and period of sampling for municipal wastewater is given in Table 9.9.

Table 9.6 Frequency of measuring and period of sampling for municipal wastewater

Wastewater treatment plant capacity expressed in PE(1), (population equivalent)	**Frequency of measurement of basic and specific parameters (number of measurements per year)(2), (3)**	**Sampling period of a representative sample (hours)**
< 50	1 measurement per year	2

In accordance with the characteristics of wastewater generated and discharged into the recipient, the project holder is obligated to conduct regular monitoring of wastewater quality after biological treatment, including: temperature, pH value, biochemical oxygen demand (BOD5), total inorganic nitrogen (NH4-N, NO3-N, NO2-N), total phosphorus, total carbon, and toxicity to fish (Tf).
At the discharge point of wastewater from the Waste-to-Energy Plant complex to the waste in the Central Collector of the Elixir Prahovo complex, regular measurements of temperature, quantity, and quality of the discharged water will be conducted.
The selected technical solutions provide easy access to locations for measuring wastewater quantities and taking samples to test water quality, both before and after treatment, at the inlet of treated water into the recipient, i.e., the Central Collector of the Elixir Prahovo complex.

9.2.1.4 SURFACE WATER QUALITY MONITORING

The nearest watercourse to the site in question is the Danube River (at a distance of about 500m in the north direction from the plant boundary). River basin – Danube; Water district - Danube according to Art.
27. of the Law on Waters, Decision on determining the boundaries of river basin districts ("Official Gazette of RS" No. 75/2010) and the Rulebook on Determination of Sub-basins ("Official Gazette of RS" No. 54/2011). According to the Decision on Determining the List of Waters of the First Order ("Official Gazette of RS" No. 83/10), the Danube River is classified as 1. Interstate waters 1) natural watercourses. According to the Regulation on the Categorization of Watercourses ("Official Gazette of RS" No. 5/1968), the river section in question belongs to Class II for the Danube section: from the Hungarian border - to the Bulgarian border. The facilities in question are located in the area of water unit number 12, "Danube and Timok – Negotin", according to the Rulebook on the determination of water units and their boundaries, ("Official Gazette of RS", No. 8/2018).

Considering that the Danube is an international river, on 29 June 1994 the Convention on Cooperation for the Protection and Sustainable Use of the Danube River was signed in Sofia (Bulgaria), which entered into force in October 1998 when it was ratified by the ninth signatory. Serbia became a contracting party by adopting the Law on Ratification of the Convention on Cooperation for the Protection and Sustainable Use of the Danube River ("Official Gazette of FRY - International Treaties", No. 2/2003). The Convention aims to ensure that surface and groundwater in the Danube River Basin is managed and used in a sustainable and equitable manner, including:

- conservation, improvement and rational use of surface and groundwater;
- preventive measures to control hazards arising from accidents involving floods, ice or hazardous substances;
- measures to reduce the burden of pollution entering the Black Sea from sources in the Danube River Basin.

In order to obtain a more complete view of the state of surface water quality at the subject location as well as an adequate assessment of the impact of the existing ELIXIR PRAHOVO complex on the water quality of the Danube River, the operator of the chemical complex conducts regular monitoring of wastewater and surface water quality in the subject area. Testing of wastewater from the ELIXIR PRAHOVO complex and surface waters of the Danube River is carried out **quarterly on an annual** basis, by sampling and physical and chemical testing of water quality by the Institute for Prevention, Occupational Safety, Fire Protection and Development LTD. Novi Sad, Branch "27. January" Niš at four measuring points as shown in Table 9.10.

Table 9.7 Sampling points for wastewater of the ELIXIR PRAHOVO complex and surface waters (Danube River)

Measuring point	Wastewater	Sampling point	Coordinates	
			N	E
OV1	Wastewater before treatment system	Sampling point manhole located at the entrance to the neutralization pit	44º17'06,89''	22º36'35.39''
OV2	Wastewater after treatment system	Sampling point manhole located in auxiliary facility at the outlet of wastewater from the plant	44º17'07,78''	22º36'37.93''
PV1	**Danube River 150 m upstream of the inlet of collective wastewater**	**The sampling point is located on the bank of the Danube River, 150 m upstream of the wastewater outflow**	**44º17'27.50''**	**22°36'58.08''**

PV2	**Danube River 100 m downstream of the inlet of collecting wastewater**	**The sampling point is located on the bank of the Danube River, 100 m downstream of the wastewater outflow**	**44º17'21.08''**	**22º37'25.39''**

The results of the testing of wastewater after treatment system facility from the Elixir Prahovo complex show that the concentrations of the tested parameters comply with the emission limit values prescribed by the Regulation on Limit Values of Pollutant Emissions into Water and Deadlines for Reaching Them ("Official Gazette of RS", No. 67/2011, 48/2012 and 1/2016, Appendix 2, Other wastewaters, 4. Limit values for emissions of wastewater containing mineral oils and with emission limit values prescribed by Commission implementing decision EU 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliaments and the Council for waste incineration (notified under documents C(2019)7987, tables 5.9 and 5.10.

The results of the physico-chemical and chemical analyses of surface water samples (watercourses), i.e. relevant parameter values, were compared with the limit values of quality classes prescribed by the **Regulation on limit values of pollutants in surface and groundwater and sediment and deadlines for their reach (Official Gazette of RS, No. 50/2012), Appendix 1, Table 1 and 3.** 50/2012) The values of priority and priority hazardous substances were compared with the values of environmental quality standards (EQS), i.e. the average annual concentration (AAC) and the maximum allowable concentration (MAC), prescribed by the **Regulation on Limit Values of Priority and Priority Hazardous Substances that Pollute Surface Waters and Deadlines for Reaching Them ("Official Gazette of RS", No. 24/2014), Appendix 1, Table 1**. To determine the quality class, the criteria prescribed by the Regulation on Limit Values of Pollutants in Surface and Groundwater and Sediment and Deadlines for Their Reach (Official Gazette of RS, No. 50/2012).
Measurements were performed in accordance with the Rulebook on the manner and conditions for measuring and testing the quality of wastewater and their impact to the recipient and the content of the report on the performed measurements ("Official Gazette of RS", No. 18/2024) and the applicable standards in this field.

Bearing in mind that all wastewater, which meets the prescribed ELV, from the subject Waste-to-Energy Plant will be collectively discharged into the existing Central collector of clean water of the Elixir Prahovo industrial complex, which is discharged into the natural recipient – the Danube River, it is the obligation of the Project Holder to perform regular quarterly monitoring of the surface water quality of the Danube River upstream and downstream of the inflow of wastewater from the Central collector of clean water of the Elixir Prahovo industrial complex after the implementation of the project in question.

At the request of the Ministry of Environmental Protection and Water of the Republics of Bulgaria and Romania, access to data on surface water quality

monitoring will be provided.
The monitoring program includes testing the quality of the natural recipient in accordance with the aforementioned regulations of the Republic of Serbia (RS) and international regulations with a scope nearly equivalent to that outlined in the Romanian regulation "Regulation on Setting Pollutant Load Limits for Industrial and Urban Wastewater Discharge into Natural Recipients, NTPA-001/2002, of February 28, 2002."
The list of parameters and emission limit values for pollutants for the natural recipient (the Danube River) is provided in Table 9.8. The monitoring covers parameters defined by RS regulations, with additional monitoring established for parameters not specified in RS regulations but defined in relevant Romanian legislation, which also sets their limit values.

Table 9.8: List of parameters and limit values

Parameter	Regulation	Unit	Limit value
General	Law on Water ("Official Gazette of RS", No. 30/10 and 93/2012), Regulation on limit values of pollutants in surface and underground waters and sediments, and deadlines for their achievement ("Official Gazette of RS No. 50/2012, Annex 1, Tables 1 and 3). To determine the quality class, criteria from the aforementioned regulation were used ("Official Gazette of RS No. 50/2012) Regulation on hazardous substances in water ("Official Gazette of RS", No. 31/82)		
pH		-	6.5- 8.5
Temperature		°C	35
Suspended matter		mg/l	25
Oxygen regime			
Dissolved oxygen		mg O2/l	7
Oxygen saturation			
Epilimnion (stratified water)		%	70- 90
Hypolimnion (stratified water)		%	70- 50
Non-stratified water		%	50- 70
BPK5		mg O2/l	5
COD (Dichromate method)		mg O2/l	10
COD (Permanganate method)			5
Total Organic Carbon (TOC)		mg/l	5
Nutrients			
Total nitrogen		mg N/l	2
Nitrates		mg N/l	3
Nitrites		mg N/l	0.03
Ammonium ion		mg N/l	0.3
Non-ionized ammonia		mg l/ NH3	0.025
Total phosphorus		mg P/l	0.2
Orthophosphates		mg P/l	0.1
Salinity			
Chlorides		mg/l	100
Residual chlorine		mg/l HOCl	0.005
Sulfates		mg/l	100
Total mineralization		mg/l	1000
Electrical conductivity at 20°C		mS/cm	1000

Metals			
Arsenic		µg/l	10
Boron		µg/l	1000
Copper		µg/l	5 (T = 10) 22 (T = 50) 40 (T = 100) 112 (T = 300)
Zinc		µg/l	300 (T = 10) 700 (T = 50) 1000 (T = 100) 2000 (T = 500)
Chromium (total)		µg/l	50
Iron (total) Manganese (total)		µg/l µg/l	500 100
Organic compounds			
Phenolic compounds (as C_2H_5OH)		µg/l	1
Petroleum hydrocarbons		mg/ dm3	20
Surface-active substances (as lauryl sulfate)		µg/l	200
AOH (adsorbable organic halogens)		µg/l	50
Microbiological parameters			
Foul coliforms		cfu/100 ml	1000
Total coliforms		cfu/100 ml	10000
Intestinal enterococci		cfu/100 ml	400
Aerobic heterotrophic count (Kohl method)		cfu/100 ml	10000
Priority and priority hazardous substances	**Regulation on limit values of priority and priority hazardous substances that pollute surface waters and deadlines for their achievement ("Official Gazette of RS No. 24/2014, Annex 1, Tables 1 and 2**	unit	**MAC (Maximum allowable Concentration)**
Mercury and its compounds		µg/l	0.07
Cadmium and its compounds (depending on water hardness class)		µg/l	<0.45 (class 1) 0.45 (class 2) 0.6 (class 3) 0.9 (class 4) 1.5 (class 5)
Nickel and its compounds		µg/l	34
Lead and its compounds		µg/l	14
Substances extractable by organic solvents	**Regulation on Setting Pollutant Load Limits for Industrial and Urban Wastewater Discharge into Natural Recipients, NTPA-001/2002, of February 28, 2002.**	mg/ dm3	20
Oil derivatives		mg/ dm3	5
Filtered residue at 105°C		mg/ dm3	0.1
Sulfur and hydrogen sulfide		mg/ dm3	0.5

Sulfites		mg/ dm3	1
Total cyanides (CN)		mg/ dm3	0.1
Fluorides		mg/ dm3	2000
Aluminum		mg/ dm3	300.6
Cadmium		mg/ dm3	0.2
Lead		mg/ dm3	0.2
Hexavalent chromium		mg/ dm3	5
Nickel		mg/ dm3	0.5
Mercury		mg/ dm3	0.1
Silver		mg/ dm3	0.1
Molybdenum		mg/ dm3	0.1
Selenium		mg/ dm3	1
Magnesium		mg/ dm3	1

The block diagram of the treatment and discharge of wastewater from the Waste-to-Energy Plant complex to the waste is provided in the appendix of the study.

9.2.1.5 GROUNDWATER AND SOIL QUALITY MONITORING

9.2.1.5.1 Groundwater quality monitoring

It is the obligation of the Project Holder to perform regular monitoring of groundwater quality. At the location in question, a network of piezometers for monitoring groundwater quality has been established, and additional new piezometers are planned to be installed in order to monitor the possible impact of the future Eco Energy complex on groundwater quality.

The parameters that need to be monitored to track groundwater quality are: pH, water temperature, air temperature, barometric pressure, presence and type of odor, visible matter, color, electrical conductivity, suspended solids at 105 ˚C, total mineralization, biochemical oxygen demand (BOD), chemical oxygen demand (COD), total phosphorus, phosphates (as PO43-), mineral oils C10-C40, anionic surfactants, chlorides, sulfates, ammonia, nitrates, nitrites, calcium, magnesium, fluorides, metals (zinc, cadmium, chromium, copper, nickel, total iron, lead, cobalt, arsenic, mercury, selenium, antimony, molybdenum, titanium, tin, barium, beryllium, boron, tellurium, vanadium, silver, thorium), aromatic organic compounds (benzene, ethylbenzene, toluene, xylenes, styrene, phenol), polycyclic aromatic hydrocarbons (PAH) including naphthalene, anthracene, phenanthrene, fluoranthene,

benzo(a)anthracene, chrysene, benzo(a)pyrene, benzo(ghi)perylene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, total alpha activity, total beta active substances in pesticides including their relevant metabolites, degradation products, and reaction products, aldrin/dieldrin, atrazine, bentazon, hexachlor/heptachlorepoxide, chlorotoluron, isoproturon, carbofuran, lindane, MCPA, molinate, pendimethalin, pentachlorophenol, permethrin, pyridate, simazine, trifluralin, dichlorprop.

Quality control and observation of the groundwater regime in piezometers will be carried out in accordance with the Regulation on Limit Values of Pollutants in Surface and Groundwater and Sediment and Deadlines for Reaching Them ("Official Gazette of RS", No. 50/2012)- Appendix 2 and the Regulation on Limit Values of Pollutants, Harmful and Hazardous Substances in Soil ("Official Gazette of RS", No. 30/2018 and 64/2019) - Appendix 2 – Remedial values of pollutants, harmful and hazardous substances in the aquifer.

Table 9.9 provides a List of parameters and Testing methods for groundwater quality control in piezometers.

Table 9.9 List of parameters and Testing methods for groundwater quality control in piezometers

Pollutants	Testing method	LV[2]	Unit	Minimum monitoring requirement
pH value	EPA Method 150.1:1982	/	/	During the first year of monitoring, quarterly monitoring is recommended at all observation piezometers simultaneously, with daily measurements of groundwater levels. After the annual status review, it is suggested to switch to semi-annual quality monitoring, provided there is no deterioration in groundwater quality and all tested parameters comply with applicable legislation.
Water temperature	EPA Method 170.1:1974	/	˚C	
Air temperature	IPO1 03 108	/	˚C	
Barometric pressure	IPO1 03 108	/	mbar	
Presence and type of odor	IPO1 03 108	/	/	
Visible matter	IPO1 03 108	/	/	
Color	IPO1 03 108	/	/	
Electrical conductivity	BS EN 27888:1993	/	µS/cm	
Suspended solids at 105°C	IPOL 04 04	/	mg/l	
Total mineralization	EPA Method 160.3:1971	/		
Biochem. oxygen demand (BOD)	SRPS EN 1899-2:2009	/		
Chemical oxygen demand (COD)	EPA Method 410.1:1978 EPA Method 410.2:1978	/		
Total phosphorus	EPA Method 365.3:1978	/		
Phosphates (as $PO4^{3-}$)	EPA Method 365.2:1971	/		
Mineral oils C10-C40	IPOL 04 13	/		
Anionic surfactant	IPOL 04 06	/	µg/l	

Pollutants	Testing method	LV[2]	Unit	Minimum monitoring requirement
Chlorides	SRPS ISO 9297:1997	/	mg/l	During the first year of monitoring, quarterly monitoring is recommended at all observation piezometers simultaneously, with daily measurements of groundwater levels. After the annual status review, it is suggested to switch to semi-annual quality monitoring, provided there is no deterioration in groundwater quality and all tested parameters comply with applicable legislation.
Sulfates	EPA Method 375.4:1978	/		
Ammonia	SRPS H.Z1.184:1974	/		
Nitrates (NO_3-N)	IPOL 04 52	50[1]		
Nitrites (NO_2-N)	EPA Method 354.1:1971	/		
Ca	IPOL 04 07	/		
Mg	IPOL 04 07	/		
Fluorides	EPA Method 340.2:1974	/		During the first year of monitoring, quarterly monitoring is recommended at all observation piezometers

Pollutants	Testing method	LV[2]	Unit	Minimum monitoring requirement
				simultaneously, with daily measurements of groundwater levels. After the annual status review, it is suggested to switch to semi-annual quality monitoring, provided there is no deterioration in groundwater quality and all tested parameters comply with applicable legislation.
Metals				
Zn	EPA Method 289.1:1974	800	µg/l (in solution)	
Cd	EPA Method 213.2:1978	6		
Cr	EPA Method 218.2:1974	30		
Cu	EPA Method 220.1:1978	75		
Ni	EPA Method 249.2:1978	75		
Fe (total)	EPA Method 236.1:1974	/	mg/l (in solution)	
Pb	EPA Method 239.2:1978	75	µg/l (in solution)	
Co	EPA Method 219.1:1978	100		
As	EPA Method 206.2:1978	60		
Hg	IPOL 04 51	0,3		
Se	EPA Method 200.9:1994	160		

Pollutants	Testing method	LV[2]	Unit	Minimum monitoring requirement
Sb	EPA Method 200.9:1994	20		
Mo	EPA Method 7010:2007	300		
Ti	EPA Method 283.2:1978	/		
Sn	EPA Method 200.9:1994	50		
Ba	EPA Method 7010:2007	625		
Be	EPA Method 200.9:1994	15		
B	IPOL 04 11	/		
Te	MS-64-11-45	70	µg/l (in solution)	
V	EPA Method 7010:2007	70		
Ag	EPA Method 200.9:1994	40		
Th	EPA Method 200.9:1994	7		
Aromatic organic compounds				
Benzene	IPOL 04 09	30		
Ethylbenzene	IPOL 04 09	150		
Toluene	IPOL 04 09	1000		
Xylene	IPOL 04 09	70	µg/l (in solution)	
Styrene	IPOL 04 09	300		
Phenol	EPA Method 420.1:1978	2000		
Polycyclic aromatic hydrocarbons (PAHs)				
Naphthalene	IPOL 04 09	70	µg/l (in solution)	

Pollutants	Testing method	LV[2]	Unit	Minimum monitoring requirement
Anthracene	IPOL 04 09	5		
Phenanthrene	IPOL 04 09	5		
Fluoranthene	IPOL 04 09	1		
Benzo(a)anthracene	IPOL 04 09	0,5		
Chrysene	EPA Method 420.1:1978	0,2		
Benzo(a)pyrene	IPOL 04 12	0,05		
Benzo(ghi)perylene	IPOL 04 12	0,05		
Benzo(k)fluoranthene	IPOL 04 12	0,05		
Indeno(1,2,3-cd)pyrene	IPOL 04 12	0,05		
Other pollutants				
Total α-activity	DML 2.12:2016	/	Bq/l (in solution)	
Total β-activity	DML 2.12:2016	/		
Active substances in pesticides[3], including their relevant metabolites, degradation and reaction products	EPA 25.2/625:1994/1984	0,1[1] 0,5 (ukupan)[1,4]	µg/l (in solution) Cyclohexanone	
Aldrin/Dieldrin	EPA 25.2/625:1994/1984	0,1		
Atrazine	EPA 25.2/625:1994/1984	150		
Bentazone	EPA 25.2/625:1994/1984	/		
Heptachlor	EPA 25.2/625:1994/1984	0,3		
Heptachlorepoxide	EPA 25.2/625:1994/1984	3		

Pollutants	Testing method	LV[2]	Unit	Minimum monitoring requirement
Chlorotoluron	EPA 25.2/625:1994/1984	/		
Isoproturon	EPA 25.2/625:1994/1984	/		
Carbofuran	EPA 25.2/625:1994/1984	100		
Lindane	EPA 25.2/625:1994/1984	/		
MCPA	EPA 25.2/625:1994/1984	50		
Molinate	EPA 25.2/625:1994/1984	/		
Pendimethalin	EPA 25.2/625:1994/1984	/		
Pentachlorophenol	EPA 25.2/625:1994/1984	3		
Permethrin	EPA 25.2/625:1994/1984	/		
Pyridate	EPA 25.2/625:1994/1984	/		
Simazine	EPA 25.2/625:1994/1984	/		
Trifluralin	EPA 25.2/625:1994/1984	/		
Dichlorprop	EPA 25.2/625:1994/1984	/		

1. Average annual concentration in accordance with the Regulation on emission limit values for pollutants in surface and groundwater and sediment and deadlines for their achievement ("Official Gazette of RS," No. 50/2012) - Appendix 2.
2. Regulation on limit values for pollutants, harmful, and hazardous substances in soil ("Official Gazette of RS," Nos. 30/2018 and 64/2019) - Appendix 2: Remediation values of pollutants, harmful, and hazardous substances in the aquifer.
3. "Pesticides" include: organic insecticides, herbicides, fungicides, nematicides, acaricides, algicides, slimicides, and other similar products such as growth regulators, their metabolites, and degradation reaction products.
4. "Total" refers to the sum of all individual pesticides detected and quantified during monitoring procedures, including their relevant metabolites, degradation products, and reaction products.

9.2.1.5.2 Soil Quality Monitoring

In accordance with the provisions of the Law on Soil Protection ("Official Gazette of RS", No. 112/2015) and the Rulebook on the list of activities that may be the cause of soil pollution and degradation, procedure, data content, deadlines and other requirements for soil monitoring ("Official Gazette of RS", No. 102/2020) and the Regulation on Limit Values of Pollutants, Harmful and Hazardous Substances in Soil ("Official Gazette of RS", No. 30/2018, 64/2019) the obligation of the Project Holder is to implement the procurement procedure and select an authorized, accredited laboratory for performing Soil Monitoring at the subject location of the Waste-to-Energy Plant.

According to Rulebook on the list of activities that may be the cause of soil pollution and degradation, procedure, data content, deadlines and other requirements for soil monitoring ("Official Gazette of RS", No. 102/2020) Appendix 1, subject design contains a list of activities that may be the cause of soil pollution and degradation: **5. Waste Management**

5.1. Facilities intended for the disposal or reuse of hazardous waste with a capacity exceeding 10 t per day;
5.2. Municipal waste incineration plants whose capacity exceeds 3 t/h;
5.3. Facilities for the disposal of non-hazardous waste with a capacity of over 50 t per day.

Monitoring of the soil, where the activities from the List of the aforementioned Rulebook are performed, should show data on the condition and quality of the soil during the performance of activities.

Soil monitoring at the location in question should be carried out **every five years.** If monitoring determines the presence of certain hazardous, polluting and harmful substances in the soil, caused by human activity, in concentrations above the maximum limit values, in accordance with the regulation on limit values of polluting, harmful and hazardous substances in the soil, monitoring of these substances is carried out every year. If the results of the annual monitoring in the period of three consecutive years show that there has been no deterioration in the condition and quality of the soil, monitoring will be further performed every five years.

By hiring an authorized legal entity to perform soil monitoring with an accredited laboratory with an appropriate scope of accreditation for soil sampling and laboratory testing, the execution of soil monitoring services through sampling and analysis of soil quality parameters will be ensured at the location in question.

Soil monitoring will include the following activities:

- Field investigations
- Development of the Soil Monitoring Plan

- Soil sampling and laboratory testing
- Preparation of soil monitoring reports.

Monitoring of the soil where the activities from the List referred to in this Rulebook are performed involves monitoring the following parameters:

1. Mechanical composition of soil
2. Soil acidity (pH in water and pH in 1M KCl)
3. $CaCO_3$ content
4. Exchangeable cation capacity
5. Degree of saturation with bases
6. Organic matter content
7. Physical properties of the soil: dry soil density, solid phase density, total porosity, water retention at different pressures, accessible water, water permeability rate, structure and hardness.
8. Chemical properties: hydrolytic acidity of the soil, total N and S, content of accessible micro and macro elements (P2O5, K2O, Fe, Cu, Zn, Mn), electrical conductivity of the soil extract, anions (fluorides, chlorides, nitrites, nitrates, bromides, orthophosphates, sulfates) and cations in the soil, heavy metals (Cd, Cr, Cu, Ni, Pb, Zn, Hg, As, Ba, Co, Mo, Sb, Se)
9. Total petroleum hydrocarbons (fractions C6- C40)
10. Polycyclic aromatic hydrocarbons (PAH-total)
11. PCB polychlorinated biphenyls (total)
12. Aromatic organic compounds (benzene, ethylbenzene, toluene, xylenes, styrene, phenol and aromatic solvents)
13. Inorganic compounds (cyanides free, cyanides - complex (pH<5), cyanides - complex (pH ≥ 5)

The competent authority for issuing the Integrated Permit may define additional soil monitoring parameters. Table 9.10 provides a List of parameters and Testing methods for soil quality control.

Table 9.10 List of parameters and testing methods for soil quality control

Soil (mg/kg of absolutely dry matter)			Unit	Testing method[3]	Minimum monitoring requirement 2
Pollutant	Maximum limit value[1,4]	Remediation value [1,4]			
Soil mechanical composition	-	-	-	Research methods and determination of physical properties of soil Novi Sad: Yugoslav Soil Research Association (YSRA), Soil Testing Manual, Group of Authors, Đ. Bošnjak, ed. (1997). ISO 11277	**Every 10 years**
Active acidity (pH in H2O and substitution acidity pH in 1M KCl, (CaCl2)	-	-	-	EPA Method 9045D:2004 SRPS ISO 10390	**Every 5 years** *Note:* If monitoring detects the presence of certain hazardous, polluting, and harmful substances in the soil in concentrations above the maximum limit values, in accordance with the regulation on pollutant limit values in soil, **monitoring of these substances is conducted annually.** If the results of annual monitoring over three consecutive years show no deterioration in the state and quality of the soil, monitoring will be carried out every five years.
CaCO3 content	-	-		SRPS ISO 10693	
Moisture content	-	-	%	IPOL 04 30 SRPS ISO 11465:2022	
CEC Cation exchange capacity (Na^+, K^+, Ca^{2+}, Mg^{2+})				SRPS ISO 11260	
Base saturation			V%	Soil Testing Manual YSRA, Group of authors, M. Bogdanović, ed. (1966).	
Organic matter content	-	-	%	IPOL 04 38 SRPS ISO 10694	
Clay content	-	-	%	IPOL 04 40	
Hydrolytic acidity	-	-		Soil Testing Manual YSRA, Group of authors, M. Bogdanović, ed. (1966).	
Total N	-	-		SRPS ISO 11261 SRPS ISO 13878	

Soil (mg/kg of absolutely dry matter)			Unit	Testing method[3]	Minimum monitoring requirement 2
Pollutant	**Maximum limit value[1,4]**	**Remediation value [1,4]**			
Total S	-	-		SRPS ISO 15178	
Content of accessible micro and macro elements (P2O5, K2O, Fe, Cu, Zn, Mn)	-	-		Soil Testing Manual YSRA, Group of authors, M. Bogdanović, ed. (1966). SRPS ISO 11263 SRPS ISO 14870	
Electrical conductivity of the soil extract	-	-		SRPS ISO 11265	
Anions and cations in the soil (SO_4^{2-}, NO_2^-, CN^-, CO_3^{2-}, HCO_3^-, Cl^-, NH_4^+, K^+, Na^+, Ca^{2+}, Mg^{2+})	-	-		ISO/TS 14256-1 ISO 14256-2 SRPS EN ISO 10304-1 SRPS EN ISO 14911 ISO 11048 ISO 11262 SRPS EN ISO 17380	
Metals					
Cadmium (Cd)	0.8	12	mg/kg	IPOL 04 19 SRPS ISO 11047 SRPS ISO 11466 SRPS ISO 14870 ISO 16772	
Chromium (Cr)	100	380	mg/kg	IPOL 04 22 SRPS ISO 11047 SRPS ISO 11466 SRPS ISO 14870 ISO 16772	
Copper (Cu)	36	190		IPOL 04 21 SRPS ISO 11047	

Soil (mg/kg of absolutely dry matter)			Unit	Testing method[3]	Minimum monitoring requirement 2
Pollutant	Maximum limit value[1,4]	Remediation value [1,4]			
			mg/kg	SRPS ISO 11466 SRPS ISO 14870 ISO 16772	
Nickel (Ni)	35	210		IPOL 04 26 SRPS ISO 11047 SRPS ISO 11466 SRPS ISO 14870 ISO 16772	
Lead (Pb)	85	530		IPOL 04 27 SRPS ISO 11047 SRPS ISO 11466 SRPS ISO 14870 ISO 16772	
Zinc (Zn)	140	720		IPOL 04 28 SRPS ISO 11047 SRPS ISO 11466 SRPS ISO 14870 ISO 16772	
Mercury (Hg)	0.3	10		IPOL 04 34 SRPS ISO 11047 SRPS ISO 11466 SRPS ISO 14870 ISO 16772	
Arsenic (As)	29	55		IPOL 04 17 SRPS ISO 11047 SRPS ISO 11466 SRPS ISO 14870 ISO 16772	

Soil (mg/kg of absolutely dry matter)			Unit	Testing method[3]	Minimum monitoring requirement 2
Pollutant	Maximum limit value[1,4]	Remediation value [1,4]			
Barium (Ba)	160	625	mg/kg	IPOL 04 17 SRPS ISO 11047 SRPS ISO 11466 SRPS ISO 14870 ISO 16772	
Cobalt (Co)	9	240		IPOL 04 24 SRPS ISO 11047 SRPS ISO 11466 SRPS ISO 14870 ISO 16772	
Molybdenum (Mo)	3	200		SRPS ISO 11047 SRPS ISO 11466 SRPS ISO 14870 ISO 16772 MS-64-11-48	
Antimony (Sb)	3	15		IPOL 04 17 SRPS ISO 11047 SRPS ISO 11466 SRPS ISO 14870 ISO 16772	
Beryllium (Be)	1.1	30		IPOL 04 17 SRPS ISO 11047 SRPS ISO 11466 SRPS ISO 14870 ISO 16772	
Selenium (Se)	0.7	100		SRPS ISO 11047 SRPS ISO 11466 SRPS ISO 14870 ISO 16772	
Tellurium (Te)	-	600		IPOL 04 17 SRPS ISO 11047 SRPS ISO 11466 SRPS ISO 14870	

Soil (mg/kg of absolutely dry matter)			Unit	Testing method[3]	Minimum monitoring requirement 2
Pollutant	Maximum limit value[1,4]	Remediation value [1,4]			
				ISO 16772	
Thallium (Th)	1	15		IPOL 04 17 SRPS ISO 11047 SRPS ISO 11466 SRPS ISO 14870 ISO 16772	
Tin (Sn)	-	900		SRPS ISO 11047 SRPS ISO 11466 SRPS ISO 14870 ISO 16772	
Vanadium (V)	42	250		IPOL 04 17 SRPS ISO 11047 SRPS ISO 11466 SRPS ISO 14870 ISO 16772	
Silver (Ag)	-	15		IPOL 04 17 SRPS ISO 11047 SRPS ISO 11466 SRPS ISO 14870 ISO 16772	
Boron (B)	-	-		SRPS ISO 11047 SRPS ISO 11466 SRPS ISO 14870 ISO 16772 MS-64-11-48	
Inorganic compounds					
Cyanides - free	1	20	mg/kg	-	
Cyanides - complex (pH < 5)[1*]	5	650		-	
Cyanides - complex (pH ≥ 5)	5	50		-	

Soil (mg/kg of absolutely dry matter)			Unit	Testing method[3]	Minimum monitoring requirement 2
Pollutant	**Maximum limit value[1,4]**	**Remediation value [1,4]**			
Thiocyanates (Total)	1	20		-	
Bromides (mgBr/l)	20	-		-	
Fluorides (mgF/l)	500*	-		-	
Aromatic organic compounds					
Benzene	0.01	1	mg/kg	IPOL 04 33 SRPS EN ISO 22155 SRPS EN ISO 15009	
Ethylbenzene	0.03	50			
Toluene	0.01	130			
Xylene	0.1	25			
Styrene (vinylbenzene)	0.3	100			
Phenol	0.05	40			
Aromatic solvents	-	200			
Polycyclic aromatic hydrocarbons (PAHs)					
PAH (total) [2*]	1	40	mg/kg	IPOL 04 32 ISO 18287 ISO 11264 SRPS ISO 10382 ISO 14154 SRPS EN ISO 15009	
Other pollutants					
Total petroleum hydrocarbons (fractions C_6-C_{40})*	50	5000	mg/kg	IPOL 04 31 SRPS EN ISO 16703	

Soil (mg/kg of absolutely dry matter)			Unit	Testing method[3]	Minimum monitoring requirement 2
Pollutant	Maximum limit value[1,4]	Remediation value [1,4]			
Naphthalene	-	-		IPOL 04 32	
Anthracene	-	-		IPOL 04 32	
Phenanthrene	-	-		IPOL 04 32	
Fluoranthene	-	-		IPOL 04 32	
Benzo(a)anthracene	-	-		IPOL 04 32	
Chrysene	-	-		IPOL 04 32	
Benzo(a)pyrene	-	-		IPOL 04 32	
Benzo(ghi)perylene	-	-		IPOL 04 32	
Benzo(k)fluoranthene	-	-		IPOL 04 32	
Indeno(1,2,3-cd)pyrene	-	-		IPOL 04 32	

1. Regulation on limit values for pollutants, harmful, and hazardous substances in soil ("Official Gazette of RS," Nos. 30/2018, 64/2019) - Appendix 1: Maximum and remediation values for pollutants, harmful, and hazardous substances in soil.
2. Rulebook on the list of activities that may cause pollution and soil degradation, procedures, content of data, deadlines, and other requirements for soil monitoring ("Official Gazette of RS," No. 102/2020).
3. Sampling, preparation of samples, and testing of physical and chemical properties of soil should be performed according to the methods and standards given in Appendix 3 – Methods and standards for sampling, preparation of samples, and testing of physical and chemical properties of soil as outlined in the Rulebook on the list of activities that may cause pollution and soil degradation, procedures, content of data, deadlines, and other requirements for soil monitoring ("Official Gazette of RS," No. 102/2020).
4. Maximum limit values and remediation values for metals and arsenic, except antimony, molybdenum, selenium, tellurium, thallium, and silver, depend on the clay and organic matter content in the soil.
   Maximum limit values and remediation values for organic compounds depend on the organic matter content in the soil.
   Maximum limit values and remediation values for polycyclic aromatic hydrocarbons (PAH) depend on the organic matter content in the soil.
   For soils with an organic matter content of up to 10%, no correction is made to the maximum limit and remediation values for PAH.
   When determining the type and properties of soil, the values from the table are adjusted to the values applicable to the current soil, based on the measured organic matter and clay content.

1* - The pH value is determined in 0.01 M CaCl2.
2* - Sum of ten PAHs (anthracene, benzo(a)anthracene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, phenanthrene, fluoranthene, indeno(1,2,3-cd)pyrene, naphthalene, and benzo(ghi)perylene).
- Differentiation by clay content: (F) = 175 = 13·L (L = % clay).

Soil monitoring should be carried out in accordance with the procedure given in Appendix 2 – Monitoring of soil on which activities from the List are performed, which is an integral part of the *Rulebook on the list of activities that may be the cause of soil pollution and degradation, procedure, data content, deadlines and other requirements for soil monitoring ("Official Gazette of RS", No. 102/2020) as follows:*

1. **Selection of measuring points and taking samples for soil testing before the construction of the plant**

Prior to the construction of the plant for performing activities from the List, soil testing is performed, in order to assess the condition and quality of the soil, by:

1) soil samples are taken from the places where the foundations of the facility will be laid;
2) in places where the relief is uniform and where the area of the tested site is less than 4 ha, soil samples are taken from at least four places where the factory will be constructed;
3) in places where the terrain is uneven, soil samples are taken from all major sublocalities in order to obtain an accurate characterization of the variability of the site in terms of soil and groundwater;
4) for sites where underground facilities will be built, samples must be taken from a depth below the base of the intended facility.

2. **Selection of the number and layout of measuring points for soil sampling at the sites where the activities from the List are performed**

Before selecting the number and layout of measuring points, it is necessary to review the existing relevant documentation and conduct interviews with experts who are familiar with the technological processes in the facility and who are familiar with, if any, previous accidents at the site.

When choosing the number and layout of measuring points at the sites where the activities from the List are performed, the following shall be taken into account, in particular:

1) places where soil or groundwater pollution is known to have occurred;
2) places for storing products, raw materials, chemicals, catalysts or waste;
3) places in the immediate vicinity of plants, devices and installations where the production process is carried out or other equipment for carrying out the production process;
4) the places where the facilities for loading and unloading chemicals and/or waste are located, including loading docks;
5) storages serving the new and worn out equipment (including but not limited to transformers, vehicles and compressors) which may be a source of soil pollution;
6) area for servicing and maintenance of machines;
7) equipment washing area including but not limited to containers, tanks, filters and vehicles;
8) places close to underground septic tanks, reservoirs and pipelines;
9) areas outside the factory circle that may be affected by factory activities.

Exceptionally, if the risk of pollution is minimal due to the nature of the production process itself or if some production processes have maximum protection, the appropriate parts of the site may be exempted from monitoring.

In accordance with all of the above, soil monitoring measuring points have been determined:

- Measuring point 1: Location of the Waste-to-Energy Plant (new measuring point near the liquid waste transfer point)

GPS coordinates: N 44°17'6.35" E 22°37'5.00

- Measuring point 2: Green area immediately next to the wastewater basin U-C06 and the sanitary foul wastewater treatment plant

GPS coordinates: N 44°17'3.76 E 22°36'56.64

The exact position of the measuring points from which the samples will be taken is defined by an accredited laboratory authorized by the Ministry of the Environment, which will be hired by the Project Holder to perform the subject testing. The map of the position of measuring points with precisely defined UTM coordinates will be an integral part of the Soil Quality Test Report.

3. Schemes of sampling of soil where activities from the List are performed

The sampling of the soil where the activities from the List are performed is carried out according to the sampling schemes given in the standard SRPS ISO 18400-104 Soil Quality - Sampling - Part 104: Strategies.

Sampling, preparation of samples and testing of physical and chemical properties of the soil should be carried out according to the methods and standards given in *Appendix 3 – Methods and standards for sampling, preparation of samples and testing of physical and chemical properties of the soil of* the aforementioned Rulebook.

The measured values of soil parameters are compared with the limit maximum and remediation values of polluting, harmful and hazardous substances in the soil prescribed by the *Regulation on limit values of polluting, harmful and hazardous substances in the soil ("Official Gazette of RS", No. 30/2018 and 64/2019)-Annex 1.*

9.2.1.6 ENVIRONMENTAL NOISE LEVEL MONITORING

Noise at the subject location occurs as a result of traffic on the complex (vehicles that deliver waste), as well as due to the operation of process equipment (pumps, shredders, cranes, mixer, fans, etc.). Most of the equipment that emits higher-intensity noise will be located in closed facilities. The envisaged distance between the equipment is sufficient so that the noise level does not increase. Facilities that are not part of an indivisible technological whole are separated, in order to minimize noise levels. The plant itself is not in vicinity other noise emitters. Since the facilities in question are located in an industrial zone, noise will not have a significant impact on the environment.

In accordance with Article 23 Of the Law on Environmental Noise Protection ("Official Gazette of RS", No. 96/2021), the obligation of the Project Holder is to perform the first noise control measurement during the trial operation of the plant and to perform regular periodic measurement of the noise level in the environment during the regular operation of the plant thereafter, **once every three years.**

Measurement of noise from individual noise sources is carried out in the manner prescribed by the Regulation on noise indicators, limit values, methods for assessing noise indicators, disturbance and harmful effects of noise on human health ("Official Gazette of RS", No. 75/10), which also defines the outdoor noise limit values (Table 1 of Appendix 2). Environmental noise measurement is performed by an authorized accredited legal entity.

Table 9.11 Maximum allowable external noise level

Zone	Purpose of the space	Maximum allowable external noise level dB(A)	
		Day	Night
1.	Rest and recreation area, hospital zones and convalescent homes, cultural and historical sites, large parks	50	40
2.	Tourist areas, small and rural settlements, campsites and school zones	50	45
3.	Purely residential settlements	55	45
4.	Commercial-residential areas, commercial and residential areas, children's playgrounds	60	50
5.	City centre, craft, commercial, administrative zone with apartments, zone along highways, main and city roads	65	55
6.	Non-residential industrial, storage and service areas and transport terminals	At the border of the zone, noise must not exceed the levels in the zone bordering with	

Since there is no data on the zoning of the area in accordance with the regulations for the area in question, the criterion for the external environment in terms of noise emission was taken according to the purpose of the vulnerable facilities in the vicinity of which the complex in question is located. The subject location of the future Waste-to-Energy plant and Landfill for non-hazardous waste is located within the industrial zone IHP ELIXIR PRAHOVO. Immediately next to the border of the subject location of the future Eco Energy complex are the following existing facilities of the Elixir Prahovo complex:

- Phosphogypsum Storage – to the South
- Waste Railway sleepers Storage, Non-hazardous Waste storage and Concrete plant – to the North
- Unconstructed land and wastewater treatment plant of the Elixir Prahovo complex – to the West
- Land intended for the expansion of the production part of the industrial complex (towards Radujevac), for the formation of a chemical park, a new production complex of the same or compatible activity, with the necessary accompanying, technologically and functionally related facilities, with several independent units, with new Investors – to the East.

There are no residential buildings in the immediate vicinity of the Eco Energy complex. The settlement of Prahovo, located at a distance of about 2 km in the direction of the west, the village of Radujevac is located at a distance of about 4 km in the east-southeast direction of the project in question, the settlement of Samarinovac, at a distance of about 5 km in the southwest direction, the settlement of Srbovo, at a distance of about 6 km in the south direction, the settlement of Dušanovac, at a distance of

about 7 km in the northwest direction, and the settlement of Negotin, at a distance of about 10 km in the southwest direction. Along the border of the expansion of the Elixir Prahovo complex, at a distance of about 1300 m from the plant in the direction of the west, there is a workers' settlement (a smaller group of residential buildings).

In the subject area, the noise level in the open space is regularly measured during the operation of the production facilities of IHP Elixir Prahovo by the Institute for Prevention, Occupational Safety, Fire Protection and Development LTD., Novi Sad, Branch 27 January Niš. Measurements are made in terms of day, evening and night at three measuring points:

- M1 – is located in an open area, northwest of the production complex, on a green area in front of a residential area on the left side of the Prahovo-Radujevac road;
- M2 – is located in an open space, west of the complex, on a green area in front of the old administrative building and the settlement Kolonija, at a distance of about 100 m from the main gate;
- M3 – is located in an open area, on a green area in front of the Prahovo settlement at about 500 m from the plant and about 70 m from residential buildings.

The report on the results of noise measurements from 2024 is given as part of the State of Environmental Factors Analysis, which is attached to the Study.

In order to define the potential cumulative impact of noise in the subject area, the Project Holder is obliged to perform regular noise monitoring at the emitters aforementioned after the construction of the Eco Energy complex, as aforementioned firstly during trial operation and later during the regular operation, all in accordance with the Regulation on noise indicators, limit values, methods for assessing noise indicators, disturbance and harmful effects of noise on human health ("Official Gazette of RS", No. 75/10), more precisely on the basis of Table 1 of Annex 2 of the said Regulation, for zone 4 (business-residential areas, commercial-residential areas) for which an allowed outdoor noise level of 60 dB(A) is prescribed for day and evening, and 50 dB(A) for night.

9.2.1.7 WASTE

Waste thermal treatment shall be carried out in plants designed and built in accordance with the law governing the construction of facilities and which are equipped in accordance with this Law and other regulations.
At the site for the operation of the thermal waste treatment plant, a space must be provided for the temporary storage of waste which has determined that cannot be thermally treated.

Pursuant to the Law on Waste Management ("Official Gazette of RS", No. 36/09, 88/2010, 14/2016, 95/2018 – other law and 35/2023), the Project Holder is obliged to constantly monitor and record the quantities and types of waste collected, stored and treated at the waste management plant in question.

Waste monitoring is achieved by the following activities:

- Implementation of the Work Plan /Waste Management Plan, given that it is an IPPC plant primarily by implementing the conditions defined by the integrated permit;

- As part of the reception control, the radioactivity of the delivered waste will be tested in accordance with the Law on Radiation and Nuclear Safety and Security ("Official Gazette of RS" No. 95/18 and 10/19) and the Rulebook on Radioactivity Monitoring ("Official Gazette of RS", No. 97/2011). If the meter detects elevated radioactivity, the relevant state inspection and the ministry are immediately notified, and the driver is instructed to park the vehicle in the designated parking lot for trucks until the arrival of the inspection.

- At the entrance to the thermal waste treatment plant, the installed scale shall measure the mass of the waste transport vehicle and measure the waste received by the plant.

- Before reception of the waste for thermal treatment, the operator shall check:

1) documentation accompanying waste;

2) a waste test report prepared in accordance with the list of parameters for waste testing for the needs of thermal treatment in accordance with a special regulation;

3) hazardous characteristics of waste, the substances it should not be mixed with and precautions to be taken when handling waste;

- Prior to reception of hazardous waste for thermal treatment, the operator must implement the waste reception procedure referred to in paragraph 6 of this Article, and in particular:

1) checking the documentation accompanying hazardous waste, and, if necessary, the documentation prescribed by the regulations governing the transport of dangerous goods;

2) taking representative samples before unloading, except in cases where this is not feasible, in order to check compliance with the data from the accompanying documentation;

3) enable the competent authority to inspect and identify the waste which will undergo thermal treatment.

- The Project holder is obliged to regularly perform sampling and analysis of waste before the commencement of thermal treatment and prepare a Waste Test Report for thermal treatment and keep reports in the archive of the company; it is also the obligation of the Project holder to regularly perform testing of residues from the boiler plant before treatment (stabilization and solidification procedure). Analyses of physical and chemical properties should be performed on a representative sample taken, within the laboratory provided within the Waste-to-Energy Plant. Based on the test results, the recipes and material balances for the solidification process will be defined.

- It is envisaged that before determining the manner of disposal or recycling operations of the residue from the thermal treatment plant, appropriate examinations will be carried out to determine the physical and chemical properties and potential pollution from various residues from the process, in accordance with the Rulebook on Waste Categories, Examination and Classification ("Official Gazette of RS", No. 56/2010, 93/2019 and 39/2021), the Regulation on disposal of waste on landfills ("Official Gazette of RS", No. 92/2010), i.e. EU Landfill Directive: (Directive (EU) 2018/850 of the European Parliament and of the Council of 30 May 2018 amending Directive 1999/31/EC on the landfill of waste); The tests shall cover in particular the total soluble fractions and the heavy metals in the soluble fraction. Leaching tests for the monolithic waste in question will be performed according to the NEN 7345 Leaching Characteristics of Soil and Stony Building and Waste Materials – Leaching Tests – Determination of the Leaching of Inorganic Components from Building and Monolithic Waste Materials with the Diffusion Test (or equivalent method). The concentration limit values are given in relation to the 64-day test, but it is possible to use a shorter test, where the concentration limit values are proportionately adjusted to the length of testing.

- Reporting (announcement) to the competent ministry on the movement of hazardous waste in electronic form; Submitting data from the document on the movement of hazardous waste to the Environmental Protection Agency, electronically, by entering data from the document on the movement of hazardous waste into the Agency's information system through the portal www.sepa.gov.rs.

- Completely certified and signed Document on the movement of waste in accordance with the Rulebook on the form of the document on the movement of hazardous waste, the form of prior notification, the manner of its delivery and the instructions for their completion ("Official Gazette of RS", No. 17/2017), as a recipient /donor of hazardous waste, must also submit it to the postal address of the Ministry and the Agency, in accordance with the law governing waste management.

- By regularly completing the Document on the movement of waste as a recipient /donor of hazardous waste in accordance with the Rulebook on the form of the document on the movement of waste and the instructions for its completion ("Official Gazette of RS" No. 114/13).

- By keeping daily records on the types and quantities of waste pursuant to Article 75 of the Law on Waste Management ("Official Gazette of RS", nos. 36/2009, 88/2010, 14/2016 and 95/2018 - other law and 35/2023) and the Rulebook on the form of daily records and annual report on waste with instructions for its completion ("Official Gazette of RS", nos. 7/2020 and 79/2021), as follows:

    - Form DEO 1 - Daily Waste Records of Waste Producers – for generated waste amounts

    - Form DEO 3 - Daily waste records of the operator of the waste reuse facility - for waste that will be thermally treated and for the treatment of plant residues (S/S);

- By submitting a regular annual report on the quantities of waste to the Environmental Protection Agency by 31 March of the current year for the previous year, based on the Rulebook on the daily record form and the annual report on waste with instructions for its completion ("Official Gazette of RS", No. 7/2020 and 79/2021);

    - Form GIO 1 - Annual Waste Report of the Waste Producer – for generated waste amounts;

    - Form GIO 3 - Annual Waste Report of the Operator of the Waste Reuse Facility - for waste that will be thermally treated and for the treatment of plant residues (S/S);

    Report forms shall be submitted to the Agency as follows:

    - in electronic form by entering data into the information system of the National Register of Pollution Sources at the address of the Environmental Protection Agency:

    http://www.sepa.gov.rs/index.php?menu=20170&id=20004&action=showAll

    The report contains data on the type, quantity, origin, characterization and classification, composition, storage, transport, import, export, treatment, i.e. reuse and disposal of the generated waste, as well as waste received at the waste management plant.

- Submits to the competent authority an annual report related to the operation and monitoring of the thermal treatment plant in accordance with the Regulation on technical and technological conditions for the design, construction, equipping and operation of plants and types of waste for waste thermal treatment, emission limit values and their monitoring ("Official Gazette of RS", No. 103/2023). The reporting also includes data on the operation and monitoring of the plant and takes into account the performance of the incineration process and the level of emissions to air and water compared to the emission limit values.

9.2.2 MONITORING OF LANDFILL OPERATION AND MAINTENANCE AFTER CLOSURE

The content and method of monitoring the operation of the landfill, as well as subsequent maintenance after the closure of the landfill are defined by the Regulation on the disposal of waste at landfills ("Official Gazette of RS", No. 92/2010), Appendix 6 - Monitoring the operation of the landfill.

In order to put the subject Landfill for non-hazardous waste into functional and intended use, it is necessary to establish an effective system of monitoring and control of work in order to increase environmental safety and protection of human health. Mandatory and continuous monitoring of the operation of the Landfill for non-hazardous waste will be carried out in accordance with the aforementioned regulation.

The monitoring of the landfill operation will be carried out during the active and passive phase of the landfill and will include the following:

1) monitoring of meteorological parameters;
2) monitoring of surface waters;
3) monitoring of leachate;
4) monitoring of gas emissions;
5) monitoring of groundwater;
6) monitoring of the amount of rainwater;
7) monitoring of the landfill body stability;
8) monitoring of protective layers;
9) monitoring of pedological and geological characteristics.

The aforementioned monitoring will be carried out by sampling and measurement in the manner defined in *Appendix 6. – Monitoring the operation of the landfill*, the Regulation on disposal of waste on landfills ("Official Gazette of RS", No. 92/2010).

The following sampling and measurements will be performed:
1) in the in-house laboratory provided within the Waste-to-Energy Plant, where particular examinations are performed on a daily basis;
2) in an accredited laboratory at certain intervals prescribed by the Regulation on the disposal of waste at landfills ("Official Gazette of RS", No. 92/2010) or more frequently, if the data in the in-house laboratory show that there has been any accident situation or deviation from the zero state of certain parameters.

All data obtained from the conducted monitoring will be submitted to the Environmental Protection Agency.

In addition to the aforementioned regular monitoring, daily visual control of the operation of the landfill will be carried out, maintenance of all facilities within the landfill complex, maintenance of machinery as well as control of the efficiency of the truck wheel washing unit.

9.2.2.1 Monitoring of meteorological parameters

In accordance with the Regulation on the disposal of waste at landfills ("Official Gazette of RS", No. 92/2010), the operator is obliged to regularly measure meteorological parameters in accordance with the following schedule (see Table 9.14).

Table 9.12 Measurement of meteorological parameters

Parameter	Active phase	Passive phase
1. Rainfall	daily	daily, added to the monthly value
2. Temperature (min, max at 14.00)	daily	monthly average
3. Air flow velocity and direction	daily	not necessary.
4. Evaporation (lysimeter) *	daily	daily, added to the monthly value
5. Atmospheric humidity (at 14.00)	daily	monthly average

* or other appropriate method

Measurements can be processed in an internal laboratory that will be located within the Waste-to-Energy Plant or data can be downloaded from the nearest meteorological station, as long as the competent authority requires it in accordance with the regulation and the Law on Waste Management.

9.2.2.2 Surface water monitoring

Bearing in mind that the Danube River is located in the immediate vicinity of the location of the Landfill for non-hazardous waste in question (≈100), it is the obligation of the operator to regularly monitor the quality of the Danube River, as follows:

(1) before commissioning the landfill, by taking surface water samples, i.e. by determining the "zero state" of the quality of the Danube River;

(2) in the process of landfill exploitation for the purpose of comparison with the "zero state", at the beginning of landfill exploitation (first year) – **every month, and later every three months.**

(3) upon cessation of exploitation of the landfill for the first five years every six months, and later once a year, until the landfill dies, if the results of monitoring show that there was no accident situation.

Sampling should be carried out **at least two points, one upstream of the landfill and one downstream of the landfill.**

Sampling and testing of surface waters performed at the prescribed time intervals should be performed by hiring an accredited institution for this type of testing.

Permanent monitoring of surface waters during the exploitation of the landfill with shortened chemical and bacteriological analyses will be carried out every 15 days in the internal laboratory. Table 9.15 shows the frequency of sampling and measuring of surface water quality.

Table 9.13 The frequency of sampling and measuring should be performed as follows

Parameter	Active phase	Passive phase(1)
Volume and composition of surface water(7)	Quarterly(1)	Every six months

(1) if the assessment of the data indicates that longer intervals are equally effective, measurements can be performed at those intervals, but only once a year.

9.2.2.2.1 Surface water quality monitoring

As stated in section 9.2.1.4 of the study, the closest watercourse to the subject location is the Danube River (approximately 500 m north of the DNO boundary). Basin - Danube; Water area - Danube, according to Article 27 of the Water Law, the Decision on determining the boundaries of water areas ("Official Gazette of RS," No. 75/2010), and the Rulebook on determining sub-basins ("Official Gazette of RS," No. 54/2011). According to the Decision on establishing the Register of First-Order Waters ("Official Gazette of RS," No. 83/10), the Danube River is classified as a first-order transboundary water (natural watercourses). According to the Regulation on the categorization of watercourses ("Official Gazette of RS," No. 5/1968), the respective section of the river belongs to Class II for the section Danube: from the Hungarian border to the Bulgarian border. The facilities in

question are located within water unit number 12, "Danube and Timok – Negotin," in accordance with the Rulebook on determining water units and their boundaries ("Official Gazette of RS," No. 8/2018).
In order to monitor the surface water quality at the subject location and adequately assess the impact of the future DNO operation on the quality of the Danube River water, the Project Holder is obligated to conduct regular monitoring of surface water quality in the subject area.
The results of physical-chemical and chemical analyses of surface water (watercourse) samples, i.e., the relevant parameter values, are compared with the quality class limit values prescribed by the Regulation on limit values for pollutants in surface and groundwater and sediment and deadlines for their achievement ("Official Gazette of RS," No. 50/2012), Appendix 1, Tables 1 and 3. The values of priority and priority hazardous substances are compared with the values of environmental quality standards (EQS), i.e., the average annual concentration (AAC) and maximum allowable concentration (MAC), prescribed by the Regulation on limit values of priority and priority hazardous substances polluting surface waters and deadlines for their achievement ("Official Gazette of RS," No. 24/2014), Appendix 1, Tables 1 and 2.
For determining the quality class, the criteria prescribed by the Regulation on limit values for pollutants in surface and groundwater and sediment and deadlines for their achievement ("Official Gazette of RS," No. 50/2012) were used.
Table 9.14 provides the limit values of pollutants in surface water in accordance with the aforementioned regulation.

Table 9.14: Limit values of pollutants in surface waters

Parameter	Unit	Limit value[1]	Average annual concentration [2]	Maximum allowe concentration[2,3]
General parameters				
pH	-	6.5- 8.5	-	-
Temperature	°C	35	-	-
Suspended matter	mg/l	25	-	-
Oxygen regime				
Dissolved oxygen	mg O2/l	7		-
Oxygen saturation				
- Epilimnion (stratified water)	%	70- 90	-	-
- Hypolimnion (stratified water)	%	70- 50	-	-
Non-stratified water	%	50- 70	-	
BPK5	mg O2/l	5	-	-
COD (Dichromate method)	mg O2/l	15	-	-
COD (Permanganate method)		10	-	-
Total Organic Carbon (TOC)	mg/l	5	-	-
Nutrients				
Total nitrogen	mg N/l	2	-	-
Nitrates	mg N/l	3	-	-
Nitrites	mg N/l	0.03	-	-
Ammonium ion	mg N/l	0.3	-	-
Non-ionized ammonia	mg l/ NH3	0.025	-	-
Total phosphorus	mg P/l	0.2	-	-
Orthophosphates	mg P/l	0.1	-	-
Salinity				

Chlorides	mg/l	100	-	-
Residual chlorine	mg/l HOCl	0.005	-	-
Sulfates	mg/l	100	-	-
Total mineralization	mg/l	1000	-	-
Electrical conductivity at 20°C	mS/cm	1000	-	-
Metals				
Arsenic	µg/l	10	-	-
Boron	µg/l	1000	-	-
Copper	µg/l	5 (T = 10) 22 (T = 50) 40 (T = 100) 112 (T = 300)	-	-
Zinc	µg/l	300 (T = 10) 700 (T = 50) 1000 (T = 100) 2000 (T = 500)	-	-
Chromium (total)	µg/l	50	-	-
Iron (total)	µg/l	500	-	-
Manganese (total)	µg/l	100	-	-
Mercury	µg/l		-	0,07 [2] 1 [3]
Cadmium	µg/l		<0,08 (class 1) [2] 0,08 (class 2) [2] 0,09 (class 3) [2] 0,15 (class 4) [2] 0,25 (class 5) [2]	<0,45 (class 1)[2] 0,45 (class 2) [2] 0,6 (class 3) [2] 0,9 (class 4) [2] 1,5 (class 5) [2] 5[3]
Nickel	µg/l		4 [2.4]	34[2] 50 [3]
Lead	µg/l		1.2 [4]	14[2] 50[3]
Organic substances				
Phenolic compounds (such as C_2H_5OH)	µg/l	1	-	-
Petroleum hydrocarbons	mg/ dm3	20	-	-
Surface-active substances (as lauryl sulfate)	µg/l	200	-	-
AOH (adsorbable organic halogens)	µg/l	50	-	-
Microbiological parameters				
Foul coliforms	cfu/100 ml	1000	-	-
Total coliforms	cfu/100 ml	10000	-	-
Intestinal enterococci	cfu/100 ml	400	-	-
Aerobic heterotrophic count	cfu/100 ml	10000	-	-

(Kohl method)				
Regulation on Setting Pollutant Load Limits for Industrial and Urban Wastewater Discharge into Natural Recipients, NTPA-001/2002, of February 28, 2002.				
Substances extractable by organic solvents	mg/ dm3	20	-	-
Oil derivatives	mg/ dm3	5	-	-
Filtered residue at 105°C	mg/ dm3	0.1	-	-
Sulfur and hydrogen sulfide	mg/ dm3	0.5	-	-
Sulfites	mg/ dm3	1	-	-
Total cyanides (CN)	mg/ dm3	0.1	-	-
Fluorides	mg/ dm3	2000	-	-
Aluminum	mg/ dm3	300.6	-	-
Cadmium	mg/ dm3	0.2	-	-
Lead	mg/ dm3	0.2	-	-
Hexavalent chromium	mg/ dm3	5	-	-
Nickel	mg/ dm3	0.5	-	-
Mercury	mg/ dm3	0.1	-	-
Silver	mg/ dm3	0.1	-	-
Molybdenum	mg/ dm3	0.1	-	-
Selenium	mg/ dm3	1	-	-
Magnesium	mg/ dm3	1	-	-

1. Regulation on limit values for pollutants in surface and groundwater and sediment and deadlines for their achievement ("Official Gazette of RS," No. 50/2012), Appendix 1, Tables 1 and 3.
2. Regulation on limit values of priority and priority hazardous substances polluting surface waters and deadlines for their achievement ("Official Gazette of RS," No. 24/2014), Appendix 1, Tables 1 and 2.
3. Rulebook on hazardous substances in waters ("Official Gazette of SRS," No. 31/82).
4. These values for environmental quality standards indicate concentrations of substances that are bioavailable.

9.2.2.3 Monitoring of leachate

The subject project envisages a closed system with the collection of leachate by a system of canals that first deliver the leachate to the leachate pool, and then pump it to the waste-to-energy plant where its treatment is carried out.
The subject project envisages monitoring the quality of leachate on a representative number of samples, which are taken before the controlled drainage of water from the landfill site.

Measurement of the volume and composition, i.e. qualitative and quantitative parameters of leachate, is performed once a month during the exploitation of the landfill. The quality of the leachate will be examined in the wastewater pool at the Waste-to-Energy Plant, where it is pumped from the leachate pool.

These measurements will also be carried out after the cessation of exploitation of the landfill every six months for the first five years, and then once a year until the landfill dies. Table 9.16 shows the frequency of sampling and measuring of leachate.

Table 9.15 The frequency of sampling and measuring should be performed as follows

Parameter	Active phase	Passive phase(2)
1. Leachate volume	Monthly(1)(2)	Every six months
2. Leachate composition (2)	Quarterly(3)	Every six months

(1) the frequency of sampling can be adjusted based on the morphological composition, and is determined by the permit.
(2) if the assessment of the data indicates that longer intervals are equally effective, measurements can be performed at those intervals, but only once a year.

9.2.2.3.1 Monitoring of leachate water quality

The project includes a closed system for collecting leachate water through a system of channels that first direct the leachate water to a leachate water pool. From there, it is pumped to the Waste-to-Energy facility, where it is treated, and subsequently subjected to a final analysis at the discharge point of technological wastewater from the Waste-to-Energy Plant complex, in accordance with the monitoring prescribed in section 9.2.1.3.1 Monitoring of Wastewater from the Boiler Plant.

The project anticipates internal monitoring of the leachate water quality on a representative number of samples, which are taken during the controlled discharge of water from the landfill location before being received into the appropriate wastewater pool U-C06 within the Waste-to-Energy Plant complex.

Leachate water from the non-hazardous waste landfill will initially be treated within the Waste-to-Energy Plant complex using oil and grease separators. Following this, the water is directed to wastewater pool U-C06 (chamber 3), and then through a sand filter and an activated carbon filter to the boiler plant wastewater treatment system for final treatment (licensed by Envirochemie (ECWWT)). After treatment, the water quality achieved complies with domestic and EU regulations. The treated water is then directed to chamber 2 of wastewater pool U-C06, whose primary role is to hold it for further testing before discharge into the recipient.

The measurement of leachate water quantities will be conducted in a reception shaft within the Waste-to-Energy Plant complex. Sampling for quality testing of leachate water will take place before and after the treatment process at designated facilities. Emission limit values for leachate water from the non-hazardous waste landfill are provided below, in accordance with the Regulation on Emission Limit Values for Pollutants into Water and Deadlines for Their Achievement ("Official Gazette of RS," Nos. 67/2011, 48/2012, 1/2016), Appendix 2 EMISSION LIMIT VALUES FOR WASTEWATER, II. OTHER WASTEWATERS 2. Emission limit values for wastewater from surface waste disposal:

Emission limit values before mixing with other wastewater at the plant level

Parameter	Unit of measure	Emission limit value	Measurement frequency [4]
Temperature	°C	30(1)	Leachate water monitoring is carried out on a representative number of samples (representative random sample or two-hour composite sample). Measurement of the
pH		6,5-9(1)	
Biochem. oxygen consumption (BOC5)	mgO_2/l	40(1)	
Chemical oxygen demand (COD)	mgO_2/l	150(1)	
Hydrocarbon index	mg/l	10(1)	
AOH (adsorbable organic halogens)(3)	mg/l	0.5(2)	
Mercury	mg/l	0.05(2)	

Cadmium	mg/l	0.1(2)	volume and composition, i.e., qualitative and quantitative parameters of leachate water, is conducted once a month during landfill operation. These measurements are also performed after the landfill operation ceases, every six months for the first five years, and then once a year until the landfill becomes inactive.
Chromium	mg/l	0.5(2)	
Chromium VI(3)	mg/l	0.1(2)	
Nickel	mg/l	1(2)	
Lead	mg/l	0.5(2)	
Copper	mg/l	0.5(2)	
Zinc	mg/l	2(2)	
Arsenic	mg/l	0.1(2)	
Cyanide, easily released	mg/l	0.2(2)	
Sulphide	mg/l	1(2)	

1. Regulation on Emission Limit Values for Pollutants into Water and Deadlines for Their Achievement ("Official Gazette of RS," Nos. 67/2011, 48/2012, 1/2016), Appendix 2: EMISSION LIMIT VALUES FOR WASTEWATER, II. OTHER WASTEWATERS, Section 4: Emission limit values for wastewater containing mineral oils.

2. Regulation on Emission Limit Values for Pollutants into Water and Deadlines for Their Achievement ("Official Gazette of RS," Nos. 67/2011, 48/2012, 1/2016), Appendix 2: EMISSION LIMIT VALUES FOR WASTEWATER, II. OTHER WASTEWATERS, Section 2: Emission limit values for wastewater from surface waste disposal.

3. For AOH, Chromium VI, easily releasable cyanides, and sulfides, values applicable to random samples are used.

4. Regulation on waste disposal at landfills ("Official Gazette of RS," No. 92/2010).

9.2.2.4.1 Air quality testing

The impact on air quality in the subject area will be based on the monitoring of ambient air quality, monitoring of suspended particles (PM10, PM2.5), and total deposited substances in accordance with the Regulation on conditions for monitoring and air quality requirements ("Official Gazette of RS," Nos. 75/10, 11/10, and 63/13): Appendix XV - Section A - MAXIMUM ALLOWABLE CONCENTRATIONS.

Total suspended particles (PM_{10}, $PM_{2.5}$)		
Averaging period	**Maximum allowable value**	**Sampling method**
One day	120 µg/m^3	SRPS EN 12341:2015
Calendar year	70 µg/m^3	
Total deposited matter		
Averaging period	**Maximum allowable value**	**Sampling method**
One month	450 mg/m^2/day	SRPS EN 14902:2008/AC:2013
Calendar year	200 mg/m^2/day	

UPPER AND LOWER ASSESSMENT THRESHOLDS
Suspended particles (PM_{10}/$PM_{2.5}$)

	Average 24-hour concentrations of PM_{10}	Average annual concentrations of PM_{10}	Average annual concentrations of $PM_{2.5}$ (1)

Upper assessment threshold	70% of the limit value (35 µg/m³ (must not be exceeded more than 35 times in a calendar year)	70% of the limit value (28 µg/m^3)	70% of the limit value (17 µg/m^3)
Lower assessment threshold	50% of the limit value (25 µg/m³ (must not be exceeded more than 35 times in a calendar year)	50% of the limit value (20 µg/m^3)	50% of the limit value (12 µg/m^3)

(1) The upper and lower assessment thresholds for PM2.5 suspended particles do not apply to measurements aimed at assessing the achievement of exposure reduction targets for $PM_{2.5}$ suspended particles for the protection of human health.

LIMIT VALUE, TOLERANCE VALUE, AND TOLERANCE THRESHOLD FOR SUSPENDED PARTICLES (PM10, PM2.5)

Suspended particles PM_{10}		
	Limit value	**Tolerable value**
One day	50 µg/m³ (must not be exceeded more than 35 times in a calendar year	75 µg/m^3
Calendar year	40 µg/m^3	48 µg/m^3
Suspended particles $PM_{2.5}$ STAGE 1		
Calendar year	25 µg/m^3	30 µg/m^3
Suspended particles $PM_{2.5}$ STAGE 2(2)		
Calendar year	20 µg/m^3	20 µg/m^3

TARGET VALUES FOR PM2.5 SUSPENDED PARTICLES $PM_{2.5}$

1. Target value for PM2.5 suspended particles $PM_{2.5}$

Averaging period	Target value
Calendar year	25 µg/m^3

2. Allowable exposure level for PM2.5 suspended particles $PM_{2.5}$

Allowable exposure level
20 µg/m^3

9.2.2.4 Groundwater Monitoring

In accordance with the Regulation on the disposal of waste at landfills ("Official Gazette of RS", No. 92/2010), the operator is obliged to regularly monitor groundwater in three stages:

- sampling
- supervision
- determination of critical values.

Groundwater monitoring below the bottom of the landfill and in the immediate zone of the landfill impact

must be such as to provide information on groundwater that can be contaminated as a result of the operation of the landfill.
Samples are taken as reference values for groundwater monitoring before the commissioning of the landfill and marked as "zero state", and according to ISO 5667-2 part 11, 1993.

Groundwater samples are taken from hydrogeological facilities (piezometers, piezometer banks or observation wells) from at least three points, and of such arrangement to monitor the movement of groundwater. The final number of measuring facilities is defined by the hydrogeological conditions of the environment.
These tests of groundwater samples are carried out in order to possibly determine the occurrence of accident situations in the protective layers of the landfill, i.e. to determine the pollution of groundwater.
In addition to determining the composition of groundwater, permanent measurement of groundwater levels is also performed.

Table 9.16 The frequency of groundwater level and composition measurements will be performed in accordance with the following dynamics

Parameter	Active phase	Passive phase
Water table	Every six months (1)	Every six months (1)
Groundwater composition	frequency depending on the specificity of the terrain (2) (3)	frequency depending on the specificity of the terrain (2) (3)

(1) With an increase in the frequency of changes in water table, the frequency of sampling should be increased.

(2) If a critical level is reached, the frequency must be based on the possibility of taking corrective measures between the two samplings, i.e. the frequency must be determined on the basis of knowledge and assessment of the groundwater flow rate.
(3) When the critical level is reached, it is necessary to check by repeated sampling. Once the level has been confirmed, the contingency plan (set out in the permit) must be implemented.

In the first six months of the landfill operation every 15 days, measurement and testing (shortened chemical and bacteriological analyses) of groundwater will be performed, and after this period according to the frequencies given in the above table. Groundwater samples, taken at the time intervals given in the above table, are treated as complete chemical and bacteriological analyses in accredited institutions for this type of testing. If the results of the testing of the taken samples show that it has deviated from the limit values in accordance with the law governing water, it is considered that an accidental situation of the protective layers of the landfill has occurred. In this case, additional hydrogeological facilities shall be made taking into account the hydrogeological conditions of the environment.
All processed data are displayed by control charts with established control rules of limit values for each groundwater measuring point.

9.2.2.5.1 Groundwater quality monitoring

The Project Holder is obligated to conduct regular monitoring of groundwater quality. A network of piezometers will be established at the subject location to monitor groundwater quality, and additional new piezometers are planned to be installed to track any potential impact of the future DNO on groundwater quality.
Parameters that need to be monitored to assess groundwater quality include: general parameters (pH, temperature, pressure, presence and type of odor, visible matter, color, electrical conductivity, suspended solids, total mineralization, biochemical oxygen demand (BOD), chemical oxygen demand (COD), chlorides, sulfates, mineral oils C10-C40, ammonia, nitrates, nitrites, calcium (Ca), magnesium (Mg), fluorides, phosphates (as PO43-) and total phosphorus), metals (Cd, Cr, Cu, Ni, Fe, Pb, Zn, Hg, As, Ba, Co, Mo, Sb, Be, Se, Te, Th, Sn, V, Ag), aromatic organic compounds (benzene, ethylbenzene, toluene, xylenes, styrene, phenol), PAHs - polycyclic aromatic hydrocarbons (naphthalene, anthracene, phenanthrene, fluoranthene, benzo(a)anthracene, chrysene, benzo(a)pyrene, benzo(ghi)perylene, benzo(k)fluoranthene, Indeno(1,2,3-cd)pyrene), total alpha activity, total beta activity, total pesticides, Aldrin/Dieldrin, Atrazine, Bentazon, Hexachlor and Heptachlorepoxide, Chlorotoluron, Isoproturon, Carbofuran, Lindane, MCPA, Molinate, Pendimethalin, Pentachlorophenol, Permethrin, Pyridate, Simazine, Trifluralin, Dichlorprop.

Table 9.17 contains the list of parameters and testing methods for groundwater quality monitoring in piezometers.
Table 9.17 List of parameters and testing methods for groundwater quality control in piezometers

Pollutants	Testing method	LV[2]	Unit	Minimum monitoring requirement
pH value	EPA Method 150.1:1982	/	/	During the first year of monitoring, quarterly monitoring is recommended at all observation piezometers simultaneously, with daily measurements of groundwater levels. After the annual status review, it is
Water temperature	EPA Method 170.1:1974	/	°C	
Air temperature	IPO1 03 108	/	°C	
Barometric pressure	IPO1 03 108	/	mbar	
Presence and type of odor	IPO1 03 108	/	/	
Visible matter	IPO1 03 108	/	/	
Color	IPO1 03 108	/	/	

Pollutants	Testing method	LV[2]	Unit	Minimum monitoring requirement
Electrical conductivity	BS EN 27888:1993	/	µS/cm	suggested to switch to semi-annual quality monitoring, provided there is no deterioration in groundwater quality and all tested parameters comply with applicable legislation.
Suspended solids at 105°C	IPOL 04 04	/	mg/l	
Total mineralization	EPA Method 160.3:1971	/		
Biochem. oxygen consumption (BOC)	SRPS EN 1899-2:2009	/		
Chemical oxygen demand (COD)	EPA Method 410.1:1978 EPA Method 410.2:1978	/		
Total phosphorus	EPA Method 365.3:1978	/		
Phosphates (as $PO4^{3-}$)	EPA Method 365.2:1971	/		
Mineral oils C10-C40	IPOL 04 13	/		
Anionic surfactant	IPOL 04 06	/	µg/l	
Chlorides	SRPS ISO 9297:1997	/	mg/l	During the first year of monitoring, quarterly monitoring is recommended at all observation piezometers simultaneously, with daily measurements of groundwater levels. After the annual status review, it is suggested to switch to semi-annual quality monitoring, provided there is no deterioration in groundwater quality and all tested parameters comply with applicable legislation.
Sulfates	EPA Method 375.4:1978	/		
Ammonia	SRPS H.Z1.184:1974	/		
Nitrates (NO_3-N)	IPOL 04 52	50[1]		
Nitrites (NO_2-N)	EPA Method 354.1:1971	/		
Ca	IPOL 04 07	/		
Mg	IPOL 04 07	/		
Fluorides	EPA Method 340.2:1974	/		

Pollutants	Testing method	LV[2]	Unit	Minimum monitoring requirement
				During the first year of monitoring, quarterly monitoring is recommended at all observation piezometers simultaneously, with daily measurements of groundwater levels. After the annual status review, it is suggested to switch to semi-annual quality monitoring, provided there is no deterioration in groundwater quality and all tested parameters comply with applicable legislation.
Metals				
Zn	EPA Method 289.1:1974	800	µg/l (in solution)	
Cd+Tl	EPA Method 213.2:1978	6		
Cr	EPA Method 218.2:1974	30		
Cu	EPA Method 220.1:1978	75		
Ni	EPA Method 249.2:1978	75		
Fe (total)	EPA Method 236.1:1974	/	mg/l (in solution)	

Pollutants	Testing method	LV[2]	Unit	Minimum monitoring requirement
Pb	EPA Method 239.2:1978	75	µg/l (in solution)	
Co	EPA Method 219.1:1978	100		
As	EPA Method 206.2:1978	60		
Hg	IPOL 04 51	0.3		
Se	EPA Method 200.9:1994	160		
Sb	EPA Method 200.9:1994	20		
Mo	EPA Method 7010:2007	300		
Ti	EPA Method 283.2:1978	/		
Sn	EPA Method 200.9:1994	50		
Ba	EPA Method 7010:2007	625	µg/l (in solution)	
Be	EPA Method 200.9:1994	15		
B	IPOL 04 11	/		
Te	MS-64-11-45	70		
V	EPA Method 7010:2007	70		
Ag	EPA Method 200.9:1994	40		
Th	EPA Method 200.9:1994	7		
Aromatic organic compounds				
Benzene	IPOL 04 09	30	µg/l (in solution)	
Ethylbenzene	IPOL 04 09	150		
Toluene	IPOL 04 09	1000		
Xylene	IPOL 04 09	70		
Styrene	IPOL 04 09	300		
Phenol	EPA Method 420.1:1978	2000		
Polycyclic aromatic hydrocarbons (PAHs)				
Naphthalene	IPOL 04 09	70	µg/l (in solution)	
Anthracene	IPOL 04 09	5		
Phenanthrene	IPOL 04 09	5		
Fluoranthene	IPOL 04 09	1		
Benzo(a)anthracene	IPOL 04 09	0.5		

Pollutants	Testing method	LV[2]	Unit	Minimum monitoring requirement
Chrysene	EPA Method 420.1:1978	0.2		
Benzo(a)pyrene	IPOL 04 12	0.05		
Benzo(ghi)perylene	IPOL 04 12	0.05		
Benzo(k)fluoranthene	IPOL 04 12	0.05		
Indeno(1,2,3-cd)pyrene	IPOL 04 12	0.05		
Other pollutants				
Total α-activity	DML 2.12:2016	/	Bq/l (in solution)	
Total β-activity	DML 2.12:2016	/		
Active substances in pesticides[3], including their relevant metabolites, degradation and reaction products	EPA 25.2/625:1994/1984	0.1[1] 0.5 (total)[1,4]	µg/l (in solution) Cyclohexanone	
Aldrin/Dieldrin	EPA 25.2/625:1994/1984	0.1		
Atrazine	EPA 25.2/625:1994/1984	150		
Bentazone	EPA 25.2/625:1994/1984	/		
Heptachlor	EPA 25.2/625:1994/1984	0.3		
Heptachlorepoxide	EPA 25.2/625:1994/1984	3		
Chlorotoluron	EPA 25.2/625:1994/1984	/		
Isoproturon	EPA 25.2/625:1994/1984	/		
Carbofuran	EPA 25.2/625:1994/1984	100		
Lindane	EPA 25.2/625:1994/1984	/		
MCPA	EPA 25.2/625:1994/1984	50		
Molinat	EPA 25.2/625:1994/1984	/		

Pollutants	Testing method	LV[2]	Unit	Minimum monitoring requirement
Pendimethalin	EPA 25.2/625:1994/1984	/		
Pentachlorophenol	EPA 25.2/625:1994/1984	3		
Permethrin	EPA 25.2/625:1994/1984	/		
Pyridate	EPA 25.2/625:1994/1984	/		
Simazine	EPA 25.2/625:1994/1984	/		
Trifluralin	EPA 25.2/625:1994/1984	/		
Dichlorprop	EPA 25.2/625:1994/1984	/		

1. Average annual concentration in accordance with the Regulation on limit values for pollutants in surface and groundwater and sediment and deadlines for their achievement ("Official Gazette of RS," No. 50/2012) - Appendix 2.
2. Regulation on limit values for pollutants, harmful, and hazardous substances in soil ("Official Gazette of RS," Nos. 30/2018 and 64/2019) - Appendix 2: Remediation values for pollutants, harmful, and hazardous substances in the aquifer.
3. "Pesticides" include: organic insecticides, herbicides, fungicides, nematicides, acaricides, algicides, slimicides, and other similar products, such as growth regulators, their metabolites, and degradation reaction products.
4. "Total" refers to the sum of all individual pesticides detected and quantified during monitoring procedures, including their relevant metabolites, degradation products, and reaction products.

Proposal for additional monitoring of soil and groundwater in the area of the Eco Energy complex

The necessary step in determining the state of soil quality in the subject area includes the drilling of new exploration wells in the hinterland of the industrial complex with soil and groundwater sampling. Additional drilling should be carried out:

- In order to determine the characteristics of the drilled soil, sampling should be performed for laboratory testing of the granulometric composition of approximately 5 samples per well, which would include all changes in relation to the heterogeneity of the lithological column, as well as the material immediately below the ground up to 1 m, the area above the aquifer zone, and specifically the capillary rise zone and the aquifer zone.
- Based on the drilled core of the well, soil sampling for physical and chemical soil analysis should be performed on the characteristic changes of the terrain. From each exploration well, take 1 sample in the over aquifer zone above the capillary zone, 1 sample in the capillary rise zone, 1 sample in the groundwater fluctuation zone, as well as 1 sample in the zone one meter below the aquifer level) – approximately 4 samples per well, in accordance with SRPS ISO 18400-101:2019, SRPS ISO 18400-104:2019, SRPS ISO 18400-203:2020.
- Installation of a piezometer structure made of solid threaded PVC pipes with a diameter of Ø 90 mm in accordance with (SRPS EN ISO 1452-1 and SRPS EN ISO 1452-5 as well as standards EPA/540/S-95/500).

- During the first year of groundwater quality monitoring, it is proposed that monitoring be carried out on a quarterly basis in all observation piezometers simultaneously, with daily groundwater level measurements. After the annual review of the status, it is proposed to switch to 6-month quality monitoring, in the event that there is no deterioration in the quality of groundwater, i.e. that all tested parameters are in accordance with the applicable legislation.

The establishment of an adequate monitoring system will ensure:

- consideration of the direction of groundwater flow under different conditions of the relationship between the groundwater regime, the precipitation regime and the surface water regime, by forming potentiometer maps,
- encompassing the complete convection image of the aquifer formed in the terraced deposits of the "City Terrace" as well as the aquifer formed in the Pliocene deposits, in order to determine the hydraulic dependence of the roof and floor aquifer.
- hydraulic connection between the surface waters of the Danube and the intergranular aquifer formed within the "City Terrace".
- defining hydrogeological parameters for each facility – piezometer, by testing them,
- monitoring the potential movement of the pollutant in order to alert early and applying preventive and remediation measures to improve the quality of groundwater drained into the Danube.

The concept of establishing monitoring in order to alert early by establishing three zones of representative piezometers:

A- zone - background piezometers in relation to the position of ICP Prahovo and Danube reflecting the neutral-natural composition of groundwater – where, in addition to the existing X-4 piezometer, two more piezometers, PP-1 and PP-2, being executed, of which PP-1 in the cluster – two piezometers, deeper and shallower;

Leachate monitoring zone in the landfill zone with two piezometers, one of which is the existing X-1 and D-2 whose depth reaches above the HDPE film.

B – zone – placed downstream in the direction of the underground flow towards the Danube in the immediate zone in relation to the position of a potential source of pollution – Landfill for non-hazardous waste; Based on the calculated values of advective transport, this zone should be set to a distance of 125 m in relation to the landfill, namely 3 piezometers, of which NP-1 is in a cluster (deeper and shallower)

C – zone – is set downstream in the direction of the underground flow, as a downstream control zone. Based on the calculated values of the advective transport, the control piezometers should be placed at a distance of 250 and 500 in relation to the landfill in the direction of the flow. In this zone, it is necessary to place 3 piezometers at a distance of 250 m from the landfill, with the piezometer CP-1 in a cluster (deeper and shallower). In addition, two more piezometers must be installed at a distance of 500 m.

The above concept is applied to examples of contaminated areas in Lower Saxony – Germany. With the aforementioned concept, it is necessary to include the layers that represent the Perched aquifer as well as the lower intergranular aquifer formed in Pliocene deposits.

Figure 9.2 provides a conceptual model of the proposed zoning system for monitoring the subject area.

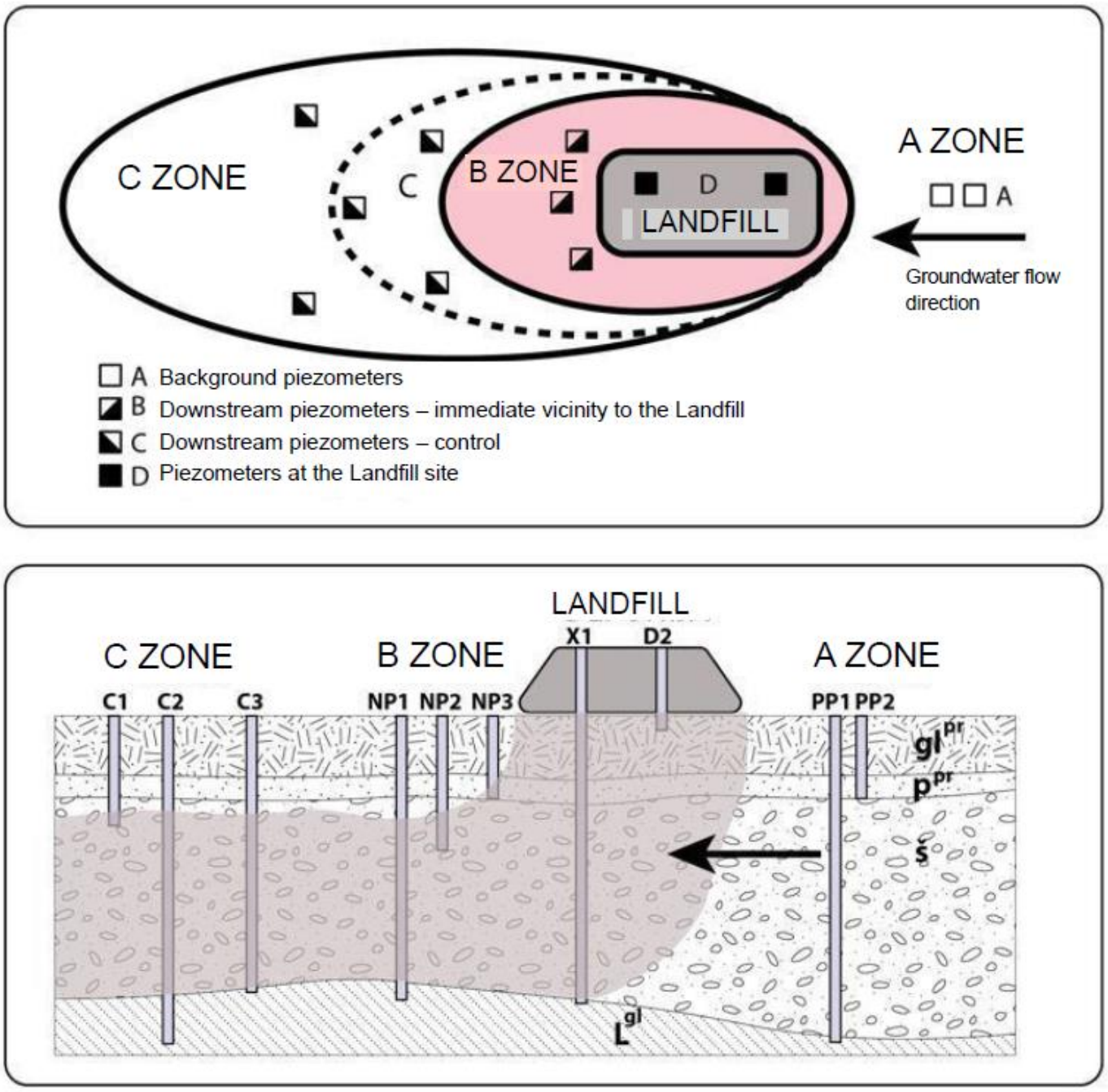


Figure 9.2 Conceptual model of the proposed zoning system for monitoring the subject area.

9.2.2.5 Monitoring the amount of rainfall (atmospheric) water

Measurement of the amount of rainwater in the area of the landfill (SRPS.U.C5.020), its accompanying facilities and in the wider protection zone shall be carried out in accordance with the law governing water.

9.2.2.6 Monitoring the stability of the landfill body

The measurement of precipitation water quantities in the area of the landfill, its associated facilities, and the wider protection zone is carried out in accordance with the Water Law ("Official Gazette of RS," Nos. 30/2010, 93/2012, 101/2016, 95/2018, and 95/2018 - other law).
The landfill is designed to establish a water circulation system. As stated in the study, two separate systems for water collection are planned:

1. Leachate water collection system, where water is first collected in the leachate water pool within the landfill and then transported to the wastewater pool located in the Waste-to-Energy facility, from where it will be sent for treatment. The measurement of the quantity and quality of leachate water is planned within the Waste-to-Energy Plant complex.
2. Atmospheric runoff collection system, where runoff from the landfill slopes will be collected in a designated concrete and waterproofed pool and used for spraying water on the landfill slopes, thereby achieving water recirculation.

Precipitation quantities in the subject area will be monitored in accordance with the monitoring of meteorological parameters outlined in section 9.2.2.1.

Table 9.18 Monitoring the stability of the landfill body

Parameter	Active phase	Passive phase
Landfill structure and composition (1)	Every year	
Landfill body level subsidence characteristic	Every year	Annual reporting
(1) Data for assessing the current state of the landfill, area occupied by waste, volume and composition of waste, method of disposal, time and duration of disposal, calculation of the remaining capacity of the landfill		

9.2.2.7 Monitoring of protective layers

Monitoring of the protective layers of the landfill will be carried out continuously by sensors installed in the artificial waterproofing lining, and the data will be monitored in the internal laboratory within the Waste-to-Energy Plant.

Monitoring of the protective layers of the landfill will be carried out continuously during the exploitation of the landfill, and after the cessation of exploitation, observation and data processing will be carried out at the intervals prescribed in the landfill permit.

9.2.2.8 Monitoring of pedological and geological characteristics

Monitoring of soil pedological characteristics and geological characteristics of the soil in the immediate zone of the landfill for the "zero state" is carried out by taking samples from shallow and deep probing pits, as well as wells periodically performed with the aim of taking samples of the geological environment from deeper layers in the immediate zone of the landfill.

The results of sample testing are performed in accredited institutions and compared with the limit values established by the landfill permit.
Sampling will be performed once a year during the exploitation of the landfill, and after the cessation of

operation of the landfill once every five years until the landfill dies.
All data obtained by monitoring are recorded in the internal laboratory and submitted to the Environmental Protection Agency.

9.2.3 WASTE

Pursuant to the Law on Waste Management ("Official Gazette of RS", No. 36/09, 88/2010, 14/2016, 95/2018 – other law and 35/2023), the Project Holder is obliged to constantly monitor and record the quantities and types of waste that are taken over and disposed of at the Landfill for non-hazardous waste, in accordance with the work procedures of the plant (pre-acceptance, acceptance, operation guidance of the plant and landfill).

Waste monitoring is achieved by the following activities:

- Implementation of the Work Plan and the permit of the competent authority for the disposal of waste at the Landfill for non-hazardous waste;
- At the entrance to the waste disposal plant, the installed scale shall measure the mass of the waste transport vehicle and measure the waste received by the plant.
- The acceptance of waste into a landfill is carried out according to a procedure that includes the following procedures:

1) examination of waste for disposal;

2) compliance check;

3) on-site check.

- By obtaining the Waste Characterization Report:

Examination of waste for disposal shall be carried out for each type of waste, in accordance with a special regulation prescribed by Regulation on disposal of waste on landfills ("Official Gazette of RS", No. 92/2010) and sampling in accordance with the prescribed standards. The data obtained by examination of waste for disposal at the landfill, in particular relate to:

1) a description of the previous waste treatment or a statement that the waste can be disposed of without prior treatment;

2) composition of waste and leachate;

3) the class of landfill to which the waste is disposed;

4) proof that the waste is not the waste referred to in Article 9 of this regulation;

5) special requirements and measures to be taken when disposing of, if necessary, in accordance with Article 13 of Regulation on disposal of waste on landfills ("Official Gazette of RS", No. 92/2010);

6) certain key parameters for checking compliance, as well as its dynamics.

For waste regularly produced in the same procedure and in the same plant, the examination produces data which particularly refer to:

1) variability in the composition of individual types of waste;

2) limits of variability of significant properties.

For waste that is regularly produced in the same process but in different plants, examination provides data related to waste from each plant based on a certain number of measurements performed.

Examination of waste intended for disposal shall be carried out by authorized professional waste examination organizations in accordance with the Law on Waste Management ("Official Gazette of RS",

nos. 36/2009, 88/2010, 14/2016 and 95/2018 - other law).

The data obtained from examination of waste are an integral part of the waste examination report for disposal, in accordance with a special regulation prescribed by Regulation on disposal of waste on landfills ("Official Gazette of RS", No. 92/2010).

Special examining: For waste regularly produced in the same process and in the same plant, for which there are data specified in Article 16, par. 2 and 3 of the Regulation on the disposal of waste at landfills, if the measurement results show small deviations from the limit values of the disposal parameters, perform examination at the first delivery, and then periodic compliance verification in accordance with the Regulation.

For waste that is not regularly produced in the same process and in the same plant, as well as for waste whose characteristics are variable, examination of waste for disposal is performed for each batch of waste and no compliance check is performed for it.

Compliance check is a periodic check of waste that is regularly submitted for disposal in order to determine whether the parameters of that waste correspond to the parameters obtained by examination of the waste for disposal and whether they meet the limit values of the parameters for disposal of waste.

The parameters for the compliance check and the dynamics of the implementation of the compliance check are contained in the report referred to in Article 16, paragraph 6 of the Regulation on disposal of waste on landfills ("Official Gazette of RS", No. 92/2010).

The compliance check is performed only for those parameters that were determined as critical during the examination of waste for disposal.

When checking compliance, the same examinations that were used in examination of waste for disposal will be applied.

The compliance check is carried out at least once a year, and the landfill operator makes sure that it is carried out according to the scope and dynamics in accordance with the regulation.

On-the-spot checks: The on-the-spot check consists of a visual inspection of each batch of waste before and after unloading, as well as a check of the accompanying documentation in accordance with this Regulation.

- Waste is accepted at the landfill if it has been determined on the spot that it is identical to the waste for which the testing or compliance check was performed, as well as the description in the waste testing report.
- Criteria for accepting or not accepting waste at the landfill are limit values of waste disposal parameters defined by the Rulebook on Waste Categories, Examination and Classification ("Official Gazette of RS", No. 56/2010, 93/2019 and 39/2021), Appendix 8, point 2. **Disposal of non-reactive hazardous waste at Landfill for non-hazardous wastes in cassettes not used for the disposal of biodegradable waste:**

Parameter	**Concentration limit value in granular waste**
Total Organic Carbon (TOC)	5%
pH	Minimum 6
Acid neutralizing capacity (ANC)	Must be assessed
	Concentration limit value in leachate in mg/ kg dm* (L/S= 10 l/kg)**
Antimony, Sb	0.7
Arsenic, As	2
Copper, Cu	50

Barium, Ba	100
Mercury, Hg	0.2
Cadmium, Cd	1
Molybdenum, Mo	10
Nickel, Ni	10
Lead, Pb	10
Selenium, Se	0.5
Chromium Total, Cr	10
Zinc, Zn	50
Evaporation residue at 105°C	60000
Soluble Organic Carbon (DOC)	800
Sulphates (SO_4^{2-})	20000
Fluorides (F^-)	150
Chlorides (Cl^-)	15000
	Concentration limit value in leachate in mg/m²kg dm (monolithic waste)* **
Antimony, Sb	0.3
Arsenic, As	1.3
Copper, Cu	45
Barium, Ba	45
Mercury, Hg	0.1
Cadmium, Cd)	0.2
Molybdenum, Mo	7
Nickel, Ni	6
Lead, Pb	6
Selenium, Se	0.4
Chromium Total, Cr	5
Zinc, Zn	30
Soluble Organic Carbon (DOC)	Must be assessed
Sulphates (SO_4^{2-})	10000
Fluorides (F-)	60
Chlorides (Cl-)	10000
	Additional concentration values in monolithic waste
pH	Must be assessed
Acid neutralizing capacity (ANC)	Must be assessed
Electrical conductivity, mS/cm at 20°C/m²	Must be assessed

- *and non-reactive hazardous waste is hazardous waste whose leaching behaviour does not deteriorate over a long period of time, under the conditions present at the landfill or a possible accident: in the waste itself, due to the influence of external factors (temperature, air or the like), the influence of other waste including waste disposal products: landfill gas and leachate).*
- ** dm – dry mass*
- *** Refers to granular or fractured monolithic waste. Leaching tests are performed according to the following standards:*
- *EN 12457-2:2002 Characterization of waste-Leaching – Compliance test for leaching of granular waste materials and sludges – Part 2: One stage batch test at a liquids to a solid ratio of 10l/kg for materials with particle size below 4mm (without or with size reduction),*

- *EN 12457-4:2002 Characterization of waste-Leaching – Compliance test for leaching of granular waste materials and sludges – Part 4: One stage batch test at a liquids to a solid ratio of 10l/kg for materials with particle size below 10mm (without or with size reduction).*
- ****Leaching tests for the monolithic waste in question will be performed according to the NEN 7345 Leaching Characteristics of Soil and Stony Building and Waste Materials – Leaching Tests – Determination of the Leaching of Inorganic Components from Building and Monolithic Waste Materials with the Diffusion Test. The concentration limit values are given in relation to the 64-day test, but it is possible to use a shorter test in the first four steps, where the concentration limit values are a quarter of the concentration values for individual parameters given in the table.*
- *In addition to the parameters given in the table, it is possible to examine other parameters that can be found in waste such as pollutants, which are significant from the aspect of risk assessment.*

- Reporting (announcement) to the competent ministry on the movement of hazardous waste in electronic form; Submitting data from the document on the movement of hazardous waste to the Environmental Protection Agency, electronically, by entering data from the document on the movement of hazardous waste into the Agency's information system through the portal www.sepa.gov.rs.

- Completely certified and signed Document on the movement of waste in accordance with the Rulebook on the form of the document on the movement of hazardous waste, the form of prior notification, the manner of its delivery and the instructions for their completion ("Official Gazette of RS", No. 17/2017), as a recipient /donor of hazardous waste, must also submit it to the postal address of the Ministry and the Agency, in accordance with the law governing waste management.

- By regularly completing the Document on the movement of waste as a recipient /donor of hazardous waste in accordance with the Rulebook on the form of the document on the movement of waste and the instructions for its completion ("Official Gazette of RS" No. 114/13).

- Pursuant to Article 75 of the Law on Waste Management ("Official Gazette of RS", nos. 36/2009, 88/2010, 14/2016 and 95/2018 - other law) and the Rulebook on the form of daily records and annual report on waste with instructions for its completion ("Official Gazette of RS", nos. 7/2020 and 79/2021) The operator at the landfill is obliged to keep daily records of the collected and disposed quantities of waste, i.e. to submit to the Agency a regular annual report on the types and quantities of disposed waste and the results of monitoring, as follows:

    - Form DEO 2 - Daily waste records of the operator of the waste disposal facility;

    - Form GIO 2 - Annual Waste Report of the Landfill Operator; The report shall in particular contain data on all necessary costs during the operation of the landfill.

  Report forms shall be submitted to the Agency as follows:

    - in electronic form by entering data into the information system of the National Register of Pollution Sources at the address of the Environmental Protection Agency:

  http://www.sepa.gov.rs/index.php?menu=20170&id=20004&action=showAll

  In particular, the report also contains data on all necessary costs during the operation of the landfill.

9.3 The locations, manner and frequency of measurement of the determined parameters.

Based on everything presented in article 9.2 of this Study consideration, table 9.19 shows a summarized tabular overview of the environmental impact monitoring program of the projects in question:

Table 9.19 Tabular overview of the environmental impact monitoring program within the Waste-to-Energy Plant

Type of measure ment	Measurement or sampling point	Parameter	Measurement frequency	Legal regulation in accordance with which the measurement is conducted
Testing of ambient air quality	Measuring point: Dragiša Brebulović-Žmiga, 11 Vuka Karadžića Street, Prahovo Coordinates: N 44°17'40,6", E 22°35'9,5"	Mass concentrations of suspended particles PM10 and PM2.5; Total content of metals (As, Cd, Pb, Ni, Cr) in the PM10 fraction of suspended particles; Mass concentration of hydrogen fluoride (HF); Total phosphorus content (P) in the PM10 fraction of suspended particles. Mass concentrations of dioxins and	Once a year for 15 days Once in 3 years	Law on Air Protection ("Official Gazette of RS", No. 36/2009, 10/2013 i 26/2021 - amended law), Regulation on conditions for monitoring and requirements for air quality ("Off. Gaz. of RS", Nos.11/2010, 75/2010, and 63/2013)

Type of measure ment	Measurement or sampling point	Parameter	Measurement frequency	Legal regulation in accordance with which the measurement is conducted
		furans		
	Measuring point 2: Automated Monitoring Station Negotin became part of the state network of the Environmental Protection Agency **Location: PI "Pčelica" /in the center/** **Continuous air quality monitoring is conducted by the Environmental Protection Agency** Coordinates: N 44° 13' 44" E 22° 31' 43"	Continuous measurement of SO2, NOx, and NH3; measurement of suspended particles PM10/PM2.5; ground-level ozone measurement; meteorological parameters; measurement of benzene, toluene, ethylbenzene, xylene, and continuous CO measurement	Air quality monitoring	Law on Air Protection ("Official Gazette of RS", No. 36/2009, 10/2013 i 26/2021 - amended law), Regulation on conditions for monitoring and requirements for air quality ("Off. Gaz. of RS", Nos.11/2010, 75/2010, and 63/2013)

Figure 9.3 shows the location of the current measuring point for ambient air quality testing.

Figure 9.3 Position of the current measuring point for ambient air quality testing – Measuring point 1

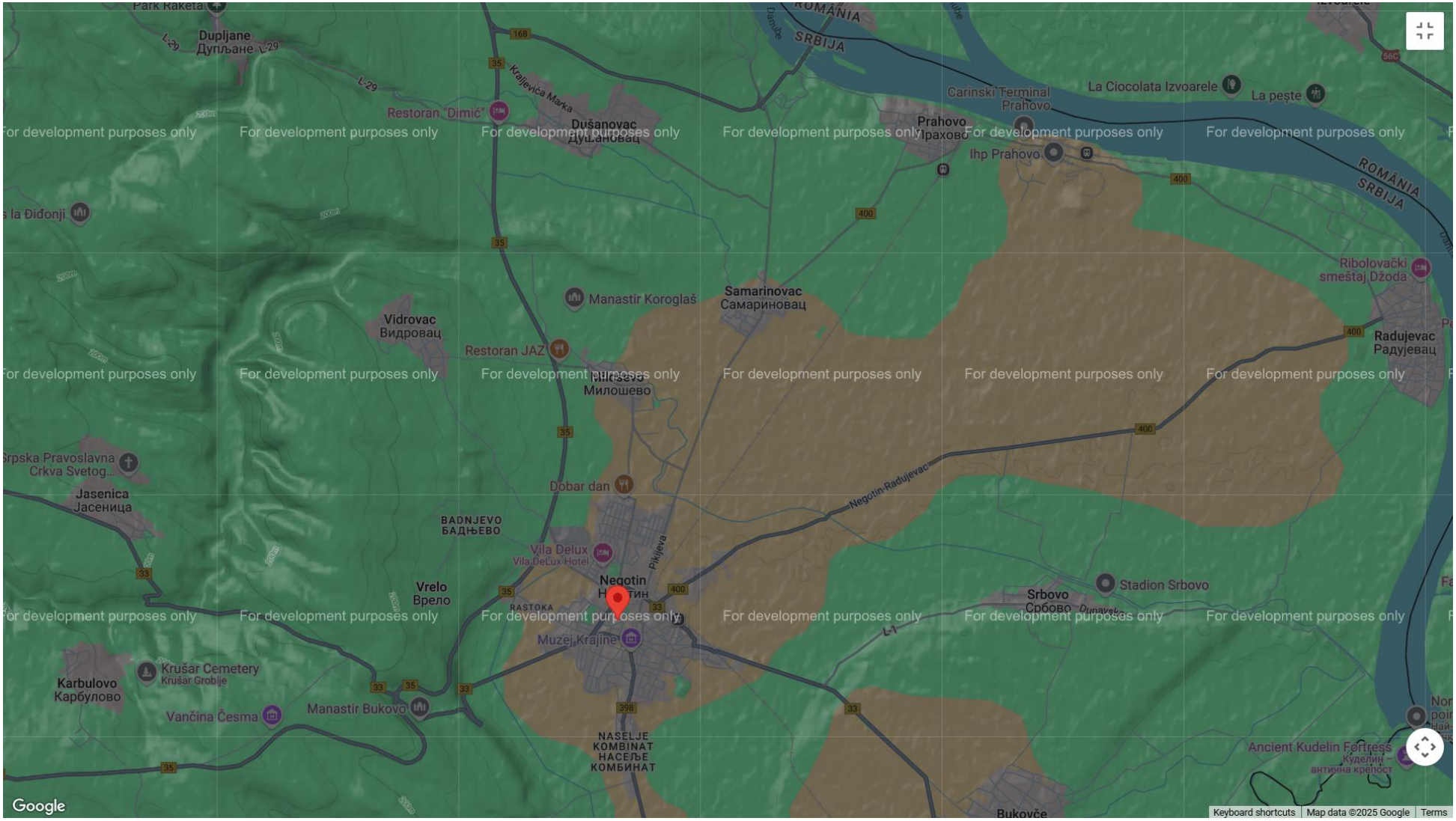


Figure 9.4 Location of the automatic measuring station Negotin – Measuring point 2

Type of measurement	Measurement or sampling point	Parameter	Measurement frequency	Legal regulation in accordance with which the measurement is conducted
Testing emissions into the air	1. Boiler plant emitter Coordinates: [Lat/Long] 44.284570 22.616845	Total particulate matter *Cd+Tl* *Sb+As+Pb+Cr+Co+Cu+Mn+Ni+V* *HCl* *HF* SO_2 *NOx* *CO* NH_3 *TVOC* *Benzo[a]pyrene* *PCDD/F* *PCDD/F + dioxin-like PCBs* *Hg* N_2O	1) Continuous measurement: nitrogen oxides (NOx), carbon monoxide (CO), total particulate matter, total organic carbon (TOC), hydrogen chloride (HCl), hydrogen fluoride (HF), sulfur dioxide (SO2), ammonia (NH3), and mercury (Hg) 2) Continuous measurement of the following process parameters: the temperature at the inner wall of the combustion chamber or another representative point of the combustion chamber and/or additional combustion chamber, in accordance with the permit issued by the competent authority, as well as the volumetric share of oxygen, pressure, temperature, and water vapor content in exhaust gases;	*Regulation on Technical and Technological Conditions for Design, Construction, Equipment, and Operation of Plants and Types of Waste for Thermal Waste Treatment, Emission Limit Values, and Their Monitoring ("Official Gazette of RS," No. 103/2023)* Appendix *2. LIMIT VALUES OF EMISSIONS OF POLLUTANTS INTO THE AIR Conclusions on the best available techniques for waste incineration (Commission Implementing Decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration)*

			3) Individual measurements of heavy metal, dioxin, and furan concentrations at least twice a year (one measurement in the first six calendar months and the other in the last six calendar months). In the first year of operation, these measurements are performed at least four times a year, spaced three months apart. Note: If the emission limit value for HCl is not exceeded and considering that an HC emission reduction device is used, HF concentration is measured periodically, at least twice a year. If the exhaust gas sample is dried before analysis, continuous measurement of water vapor in the exhaust gas is not required. The gas residence time, as well as the minimum temperature and oxygen content in	

			the process gases, are adequately verified at least once when the incineration plant is commissioned and under the most unfavorable expected operating conditions. Individual measurements of heavy metals can be performed once every two years instead of twice a year, and for dioxins and furans, once a year instead of twice, if emissions resulting from the incineration process do not exceed 50% of the emission limit values determined per Appendix 2 or Appendix 3. Regulation on Technical and Technological Conditions for Design, Construction, Equipment, and Operation of Plants and Types of Waste for Thermal Waste Treatment, Emission Limit Values, and Their Monitoring ("Official Gazette of RS," No.	

			103/2023), and in accordance with the criteria set out in paragraph 8, items 1) and 4) of Article 15 of the Regulation on Technical and Technological Conditions for Design, Construction, Equipment, and Operation of Plants and Types of Waste for Thermal Waste Treatment, Emission Limit Values, and Their Monitoring ("Official Gazette of RS," No. 103/2023). N_2O - once a year Benzo[a]pyrene - once a year Emissions during startup and shutdown when waste is not being incinerated, including PCDD/F and dioxin-like PCB emissions, are assessed based on measurement campaigns conducted at regular intervals, such as every three years, during planned startup or shutdown	

			operations.	
Testing emissions into the air	2. Emitter of the filter system of pre-treatment of waste and filters with activated carbon Coordinates: [Lat/Long] 44.285472 22.617081	Powdered substances, TVOC (BAT-AEL applies only when organic compounds in question are identified as relevant in the waste gas stream, based on the inventory mentioned in BAT 3) Organic substances, expressed as total carbon	Twice a year *(occasional emission measurements during the calendar year, one in the first six calendar months and another in the second six calendar months)*	Regulation on measurements of pollutant emissions into air from stationary pollution sources ("Official Gazette of RS," No. 5/16) and Regulation on limit values of pollutant emissions into air from stationary pollution sources other than combustion plants ("Official Gazette of RS," No. 111/2015 and 83/2021) - Appendix 1, Part VII PLANTS FOR WASTE TREATMENT AND OTHER MATERIALS, EXCEPT THERMAL TREATMENT AND BAT conclusions for waste treatment plants (Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU of the European Parliament and of the Council (notified under document C(2018) 5070) (Text with EEA relevance)
	3. Emitter of the filter system for the stabilization and solidification process Coordinates: [Lat/Long]	Powdered substances	Twice a year *(occasional emission measurements during the calendar year, one in the first six calendar*	Regulation on measurements of pollutant emissions into air from stationary pollution sources ("Official Gazette of RS," No. 5/16) and Regulation

	44.284418 22.616549		*months and another in the second six calendar months)*	on limit values of pollutant emissions into air from stationary pollution sources other than combustion plants ("Official Gazette of RS," No. 111/2015 and 83/2021) - Appendix 1, Part VII PLANTS FOR WASTE TREATMENT AND OTHER MATERIALS, EXCEPT THERMAL TREATMENT AND BAT conclusions for waste treatment plants (Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU of the European Parliament and of the Council (notified under document C(2018) 5070) (Text with EEA relevance)

Figure 9.5 Position of measuring points of air emissions

Type of measurement	Measurement or sampling point	Parameter	Measurement frequency	Legal regulation in accordance with which the measurement is conducted
Wastewater	- Chamber 2 (subchambers 2a, 2b, 2c, 2d): Wastewater from the boiler plant before discharge into the clean water collector, i.e., before discharge into the Central clean water collector of the Elixir Prahovo industrial complex	Total suspended solids (TSS), pH, temperature, flow Total Organic Carbon (TOC) Metals and metalloids: As, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Ti, Zn Dioxins and furans PCDD/F	1) Continuous measurement of pH, temperature, flow; 2) Individual daily measurement of total suspended solids (TSS); 3) Monthly measurement on a representative sample of discharged water over 24 hours, i.e., pollutants As, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Ti, Zn, TOC; 4) Measurement of dioxins and furans monthly (in case of stable results, measurements can be done once every six months).	Law on Waters ("Official Gazette of RS", No. 30/10 and 93/2012), Rulebook on the manner and conditions for measuring the quantity and testing the quality of wastewater and its impact on the recipient and the content of reports on conducted measurements ("Official Gazette of RS," No. 18/2024), Regulation on technical and technological conditions for design, construction, equipment, and operation of plants and types of waste for thermal waste treatment, emission limit values, and their monitoring ("Official Gazette of RS," No. 103/2023) and Conclusions on the best available techniques for waste incineration BATC (Commission Implementing Decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration (notified under

				document C(2019) 7987)).
Leachate from the non-hazardous waste landfill (DNO)	- Receiving shaft before leachate enters the grease and oil separator - At the outlet of the grease and oil separator, before leachate enters Chamber 3 of the wastewater basin U-C06 as part of the Energy plant for waste	Temperature pH Flow Biochem. oxygen consumption (BOC5) Chemical oxygen demand (COD) Hydrocarbon index Representative random sample or two-hour composite sample AOH (adsorbable organic halogens) Mercury Cadmium Chromium Chromium VI Nickel Lead Copper Zinc Arsenic Cyanide, easily released Sulphide	Leachate water monitoring is carried out on a representative number of samples (representative random sample or two-hour composite sample). Measurement of the volume and composition, i.e., qualitative and quantitative parameters of leachate water, is conducted once a month during landfill operation. These measurements are also performed after the landfill operation ceases, every six months for the first five years, and then once a year until the landfill becomes inactive.	Regulation on Waste Disposal at Landfills ("Official Gazette of RS," No. 92/2010) Regulation on Limit Values of Pollutant Emissions into Water and Deadlines for Their Achievement ("Official Gazette of RS," Nos. 67/2011, 48/2012, 1/2016), Appendix 2 LIMIT VALUES OF EMISSIONS FOR WASTEWATER, II. OTHER WASTEWATER 2. Limit values of emissions for wastewater from surface waste disposal

Wastewater	- Input to the oil derivatives separator - Output from the oil derivatives separator before discharge into the Central clean water collector of the industrial complex Elixir Prahovo	Temperature pH Flow Biochem. oxygen consumption (BOC5) Chemical oxygen demand (COD) Hydrocarbon index	Four times a year	Law on Waters ("Official Gazette of RS", No. 30/10 and 93/2012), Rulebook on the manner and conditions for measuring the quantity and testing the quality of wastewater and its impact on the recipient and the content of reports on conducted measurements ("Official Gazette of RS," No.18/2024), Regulation on Limit Values of Pollutant Emissions into Water and Deadlines for Their Achievement ("Official Gazette of RS," Nos. 67/2011, 48/2012, and 1/2016), Appendix 2. Limit values for emissions for wastewater; II Other wastewater; Section 4. Limit values of emissions for wastewater containing mineral oils

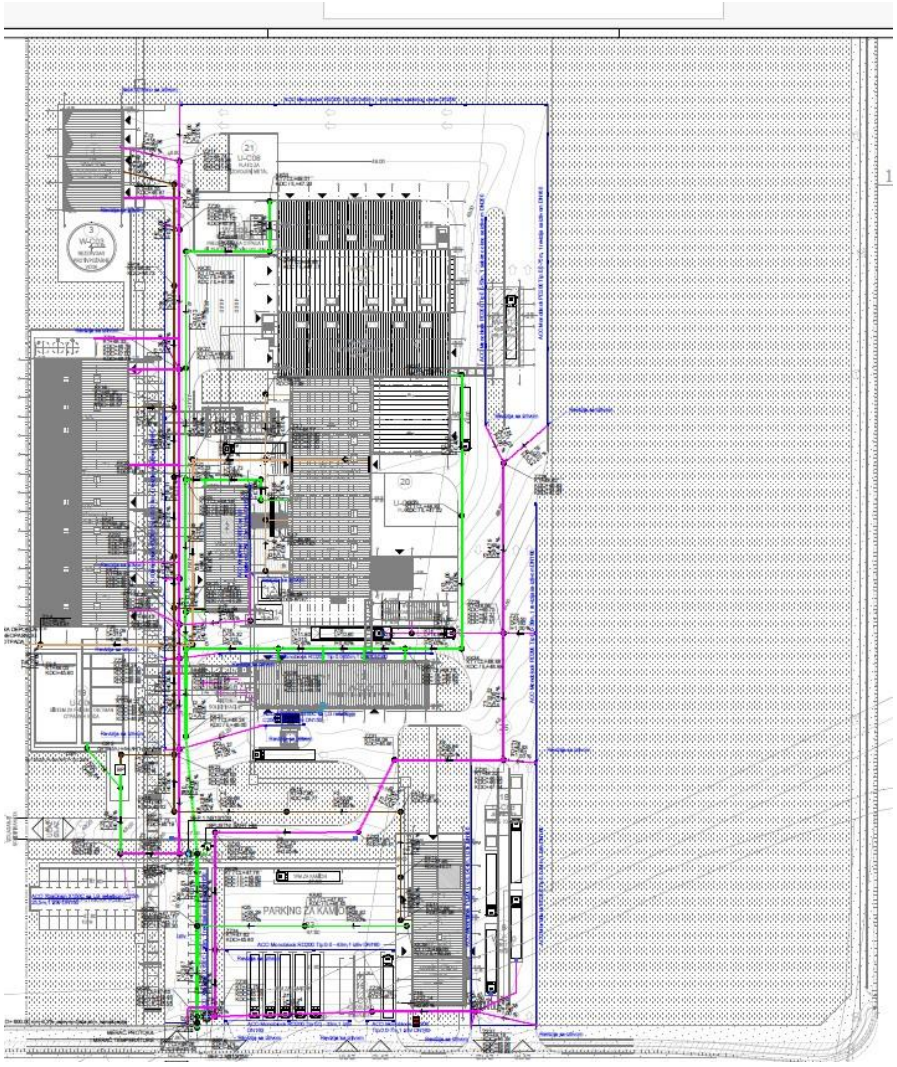


Figure 9.6 Situation of hydrotechnical installations of sewers

Type of measurement	Measurement or sampling point	Parameter	Measurement frequency	Legal regulation in accordance with which the measurement is conducted
Sanitary-foul wastewater	- Before the biological treatment plant - After the biological treatment plant	Temperature pH Flow Suspended matter Biochem. oxygen consumption (BOC5) Chemical oxygen demand (COD) Total inorganic nitrogen (NH4-N, NO3-N, NO2-N) Total phosphorus Total phosphorus Toxicity to fish (T_F)	1 measurement per year	Law on Waters ("Official Gazette of RS", No. 30/10 and 93/2012), Regulation on limit values of pollutants in water, and deadlines for their achievement ("Official Gazette of RS "No. 67/2011, 48/2012 i 1/2016), item 44. Limit values of wastewater emissions from biological waste treatment plants, table 44.1 Rulebook on the manner and conditions for measuring the quantity and testing the quality of wastewater and its impact on the recipient and the content of reports on conducted measurements ("Official Gazette of RS," No. 18/2024)
Surface water	- PV1: Danube River 150 m upstream from the outlet of combined wastewater GSP coordinates: N 44º17'27,50'' E 22º36'58,08'' The sampling location is on the riverbank of the Danube, 150 m upstream from the wastewater outlet - PV2: Danube River 100 m downstream from the outlet of combined wastewater GSP coordinates: N: 44º17'21,08'' E 22º37'25,39'' The sampling location is on the riverbank of the Danube, 100 m upstream from the wastewater outlet	pH Suspended matter Oxygen regime Dissolved oxygen Oxygen saturation - Epilimnion (stratified water) - Hypolimnion (stratified water) Non-stratified water BPK5	Four times a year	Law on Waters ("Official Gazette of RS", No. 30/10 and 93/2012), Regulation on limit values of pollutants in surface and underground waters and sediments, and deadlines for their achievement ("Official Gazette of RS No. 50/2012, Annex 1, Tables 1 and 3). Regulation on limit values of priority and priority hazardous substances that pollute

		COD (Dichromate method) COD (Permanganate method) Total Organic Carbon (TOC) Total nitrogen Nitrates Nitrites Ammonium ion Non-ionized ammonia Total phosphorus Orthophosphates Chlorides Residual chlorine Sulfates Total mineralization Electrical conductivity at 20°C Arsenic Boron Copper Zinc Chromium (total) Iron (total) Manganese (total) Phenolic compounds (such as C_2H_5OH) Petroleum hydrocarbons Surface-active substances (as		surface waters and deadlines for their achievement ("Official Gazette of RS No. 24/2014, Annex 1, Tables 1 and 2 To determine the quality class, criteria from the aforementioned regulation were used ("Official Gazette of RS" No. 50/2012) Regulation on hazardous substances in water ("Official Gazette of RS", No. 31/82)

		lauryl sulfate) AOH (adsorbable organic halogens) Foul coliforms Total coliforms Intestinal enterococci Aerobic heterotrophic count (Kohl method) Priority and priority hazardous substances Mercury Cadmium Nickel Lead Substances extractable by organic solvents Oil derivatives Filtered residue at 105°C Sulfur and hydrogen sulfide Sulfites Total cyanides (CN) Fluorides Aluminum Cadmium Lead Hexavalent chromium Nickel Mercury		**Regulation on Setting Pollutant Load Limits for Industrial and Urban Wastewater Discharge into Natural Recipients, NTPA-001/2002, of February 28, 2002.**

		Silver Molybdenum Selenium Magnesium		

Figure 9.7 shows the measuring points of surface water quality testing (Danube River).

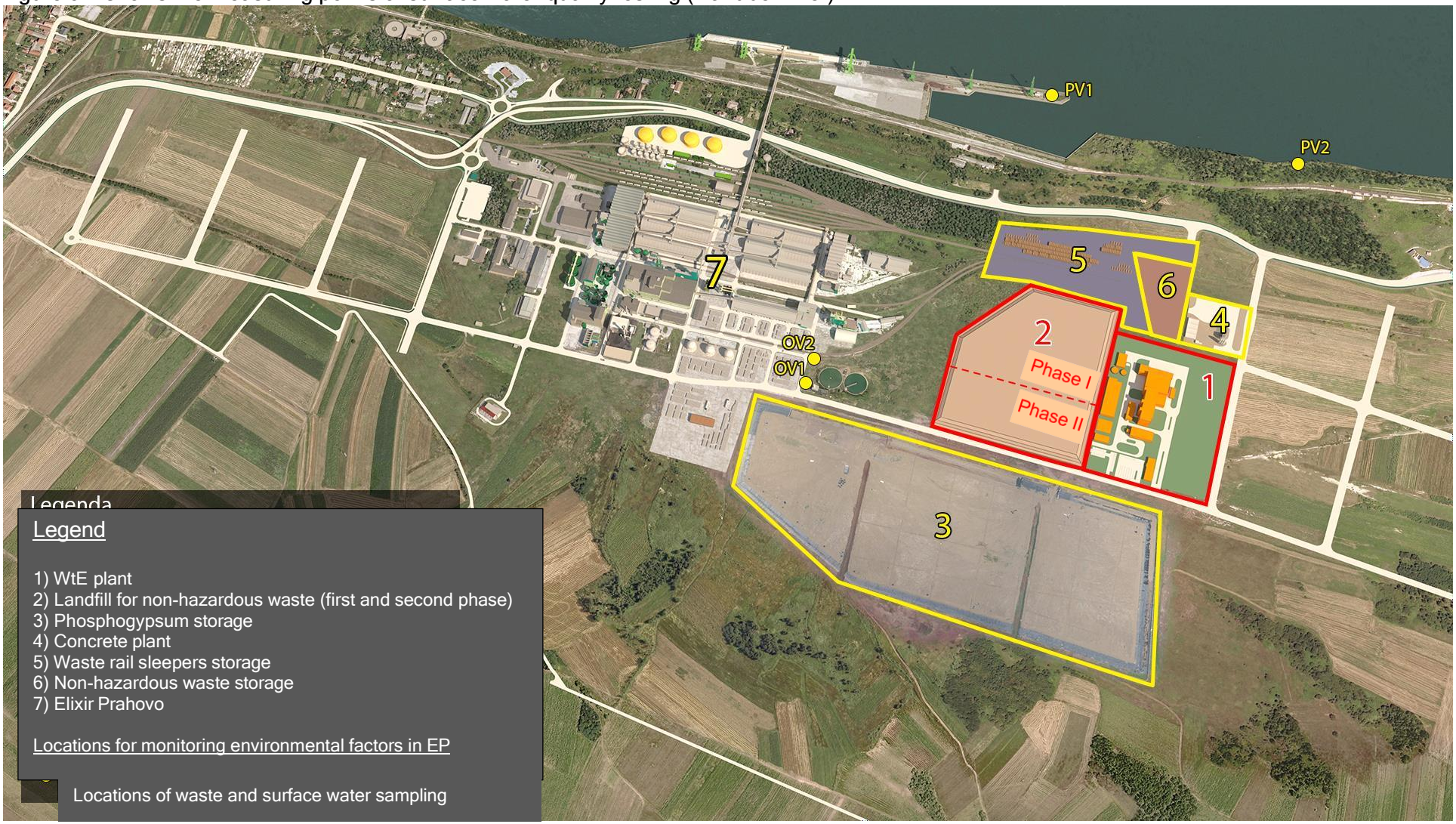


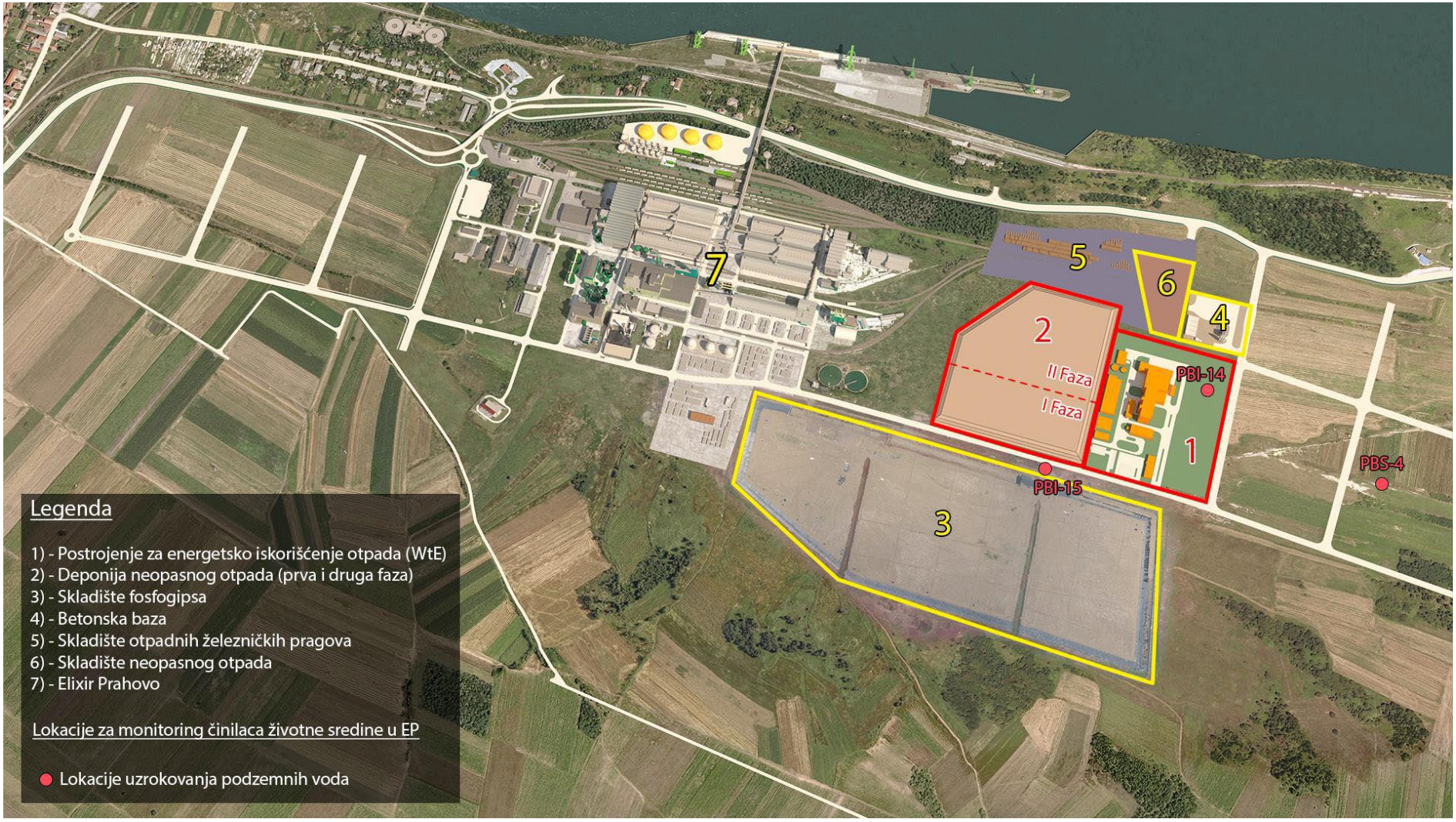
Figure 9.7 Measuring points for surface water quality testing (Danube River)

Type of measurement	Measurement or sampling point	Parameter	Measurement frequency	Legal regulation in accordance with which the measurement is conducted
Groundwater	**Locations of existing piezometers:** • **Name: X-1 (Coordinates: N 44º17'05.4", E 22º36'52.7")** • **Name: Piezometer X-2 (Coordinates:** N 44º17'1,97'', E 22º37'13,05'') • **Name: X-3 (Coordinates:** N 44º17'11,68'', E 22º38'50,0'') • **Name: X-4 (Coordinates:** N 44º16'41,9'', E 22º36'42,9'') • **Name: X-5 (Coordinates:** N 44º17'3,68''', E 22º38'8,2'') • **Name: PA-1 (Coordinates:** N 44º17'09.31'', E 22°36'38.98'') • **Name: PM-1 (Coordinates:** N 44º17'10.03'', E 22º36'26.93'') • **Name: P-2, (Coordinates:** N 44º17'19.34'', E 22º36'32.63'') **New three zones of representative piezometers:** **A - Zone**: Background piezometers relative to the position of IHP Prahovo and the Danube, reflecting the neutral-natural composition of groundwater–where, in addition to the existing X-4 piezometer, two more piezometers, PP-1 and PP-2, are installed. PP-1 is part of a cluster, consisting of a deeper and shallower piezometer. **D - Zone**: Monitoring zone for leachate in the landfill area with two piezometers, including the existing X-1 and a	Parameters include: pH, water temperature, air temperature, barometric pressure, presence and type of odor, visible substances, color, electrical conductivity, suspended solids at 105°C, total mineralization, biochemical oxygen demand (BOD), chemical oxygen demand (COD), total phosphorus, phosphates (as PO43-), mineral oils C10-C40, anionic surfactants, chlorides, sulfates, ammonia, nitrates, nitrites, calcium (Ca), magnesium (Mg), fluorides, metals (Zn, Cd, Cr, Cu, Ni, Fe (total),	During the first year of groundwater quality observation, it is proposed that monitoring be conducted quarterly across all observation piezometers simultaneously, with daily measurements of groundwater levels. After an annual status assessment, a transition to biannual monitoring is recommended if groundwater quality shows no deterioration and all parameters comply with current regulations.	Regulation on Waste Disposal at Landfills ("Off. Gazette of RS", No. 92/2010) Regulation on limit values of pollutants in surface and underground waters and sediments and deadlines for their achievement ("Official Gazette of RS ", No. No. 50/2012) - Appendix 2, and Regulation on Limit Values of Pollutants, Harmful, and Hazardous Substances in Soil ("Official Gazette of RS," Nos. 30/2018 and 64/2019) - Appendix 2 - Remediation Values of Pollutants, Harmful, and Hazardous Substances in the Aquifer Layer.

	new piezometer, D-2, whose depth reaches above the HDPE foil. **B - Zone**: Positioned downstream in the direction of the groundwater flow towards the Danube, located near the potential pollution source–the non-hazardous waste landfill. Based on calculated advection transport values, this zone is placed 125 meters from the landfill and includes three piezometers, NP-1, NP-2, and NP-3. NP-1 is part of a cluster with both a deeper and shallower piezometer. **C - Zone**: Positioned downstream in the direction of the groundwater flow as a downstream control zone. Based on calculated advection transport values, control piezometers are installed at distances of 250 and 500 meters from the landfill in the direction of the flow. In this zone, three piezometers, CP-1, CP-2, and CP-3, are installed 250 meters from the landfill, with CP-1 being part of a cluster (deeper and shallower). Additionally, two more piezometers are placed 500 meters away.	Pb, Co, As, Hg, Se, Sb, Mo, Ti, Sn, Ba, Be, B, Te, V, Ag, Th), aromatic organic compounds (benzene, ethylbenzene, toluene, xylenes, styrene, phenol), PAHs–polycyclic aromatic hydrocarbons (naphthalene, anthracene, phenanthrene, fluoranthene, benzo(a)anthracene, chrysene, benzo(a)pyrene, benzo(ghi)perylene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene), total alpha activity, total beta activity, pesticide active substances (including relevant metabolites, degradation, and reaction products), Aldrin/Dieldrin, Atrazine, Bentazon,		

		Hexachlorocyclohexane, Chlortoluron, Isoproturon, Carbofuran, Lindane, MCPA, Molinate, Pendimethalin, Pentachlorophenol, Permethrin, Pyridate, Simazine, Trifluralin, Dichlorprop.		

	In addition, two more piezometers must be installed at a distance of 500 m.			


7
5
6
4
2
II Faza
I Faza
PBI-14
1
PBS-4
PBI-15
3
Legenda
1) - Postrojenje za energetsko iskorišćenje otpada (WtE)
2) - Deponija neopasnog otpada (prva i druga faza)
3) - Skladište fosfogipsa
4) - Betonska baza
5) - Skladište otpadnih železničkih pragova
6) - Skladište neopasnog otpada
7) - Elixir Prahovo
Lokacije za monitoring činilaca životne sredine u EP
Lokacije uzrokovanja podzemnih voda

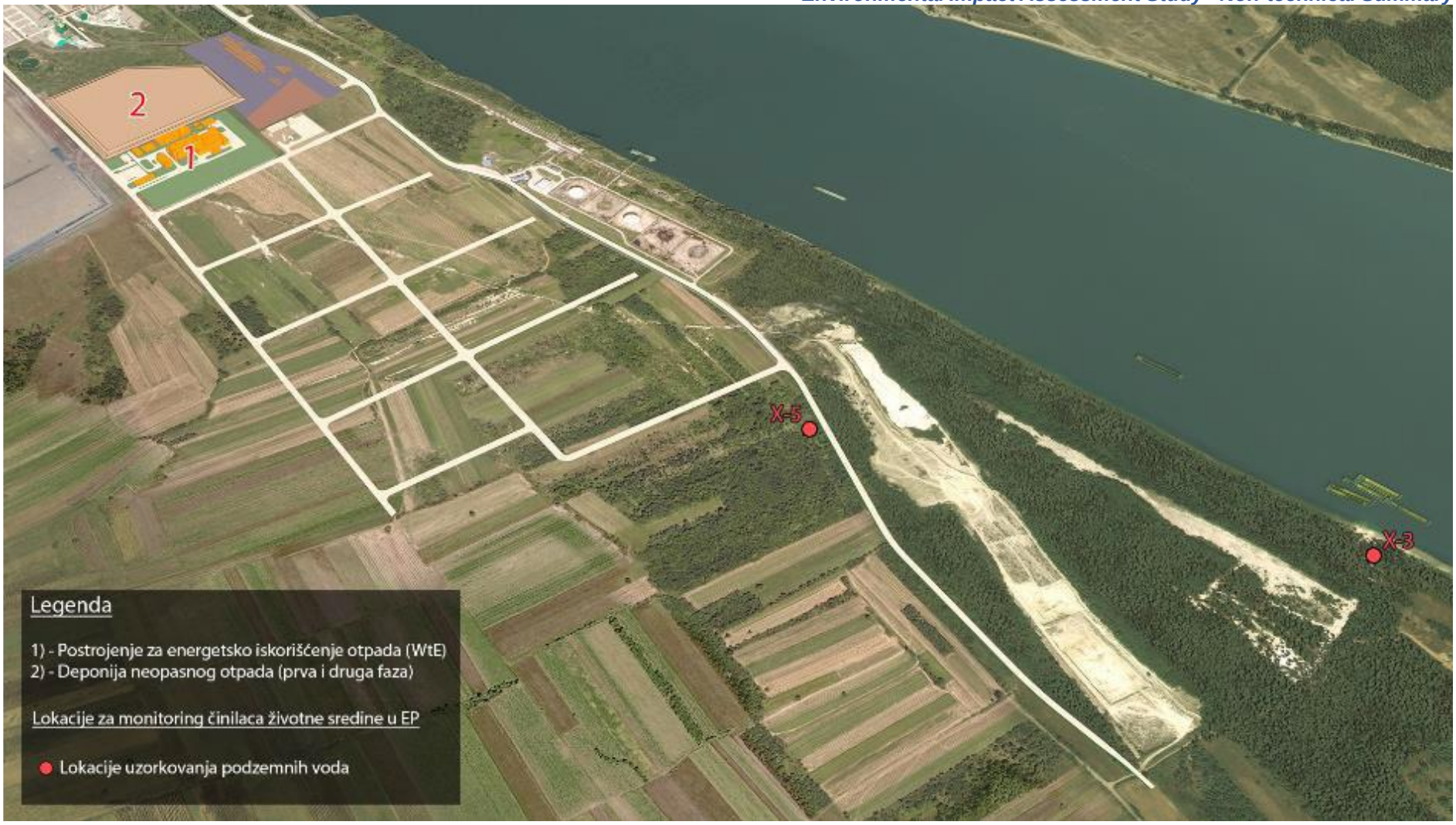


Figure 9.8 Location of existing piezometers

Figure 9.9 A tentative proposal for the arrangement of piezometers for monitoring

Type of measurement	Measurement or sampling point	Parameter
Soil monitoring	- Measuring point: The energy plant complex for waste (new measurement location near the liquid waste transfer site) GSP coordinates: N 44°17'6.35" E 22°37'5.00 - Measuring point 2: Green area near the U-C06 wastewater basin and the plant for treating sanitary-fecal wastewater GSP coordinates: N 44°17'3.76 E 22°36'56.64 *Note: The exact positions of sampling locations are determined by an accredited laboratory authorized by the Ministry of Environmental Protection and hired by the project holder. A map of the sampling locations with defined UTM coordinates will be part of the Soil Quality Testing Report. The map of the location of the measuring points with precisely defined UTM coordinates will be an integral part of the Soil Quality Test Report.*	Soil mechanical composition Active acidity (pH in H2O and substitution acidity pH in 1M KCl, (CaCl2) CaCO3 content Moisture content CEC Cation exchange capacity (Na+, K+, Ca2+, Mg2+) Base saturation Organic matter content Clay content Hydrolytic acidity Total N Total S Availability of micro and macronutrients (P2O5, K2O, Fe, Cu, Zn, Mn) Electrical conductivity of the soil extract (ECe) Anions and cations in soil (SO42-, NO2-, CN-, CO32-, HCO3-, Cl-, NH4+, K+, Na+, Ca2+, Mg2+) Metals: Cadmium (Cd) Chromium (Cr) Copper (Cu) Nickel (Ni) Lead (Pb) Zinc (Zn) Mercury (Hg) Arsenic (As) Barium (Ba)

		Cobalt (Co) Molybdenum (Mo) Antimony (Sb) Beryllium (Be) Selenium (Se) Tellurium (Te) Thallium (Th) Tin (Sn) Vanadium (V) Silver (Ag) Boron (B) Cyanides - complex (pH < 5)1* Cyanides - complex (pH ≥ 5) Thiocyanates (Total) Bromides (mgBr/l) Fluorides (mgF/l) Aromatic organic compounds: Benzene Ethylbenzene Toluene Xylene Styrene (vinylbenzene) Phenol Aromatic solvents **Polycyclic aromatic hydrocarbons (PAHs):** PAH (total) Other pollutants Total petroleum hydrocarbons (fractions C6-C40)* Naphthalene Anthracene Phenanthrene Fluoranthene Benzo(a)anthracene Chrysene

		Benzo(a)pyrene Benzo(ghi)perylene Benzo(k)fluoranthene Indeno(1,2,3-cd)pyrene

Figure 9.10 shows the position of measuring points of soil quality testing.

Figure 9.10 Position of measuring points of soil quality testing

Type of measurement	Measurement or sampling point	Parameter	Measurement frequency	Legal regulation in accordance with which the measurement is conducted
Environmental noise monitoring	Measuring point: - Measurement site M1: Northwest of the production complex, in a green area in front of a residential settlement along the Prahovo-Radujevac road; - Measurement site M2: West of the complex, in front of the old administrative building and the Colony settlement, about 100 meters from the main gate; - Measurement site M3: In a green area in front of the Prahovo settlement, about 500 meters from the facility and 70 meters from residential buildings.	Noise levels are monitored during daytime, evening, and nighttime intervals	Once every three years	In accordance with the Law on Environmental Noise Protection ("Official Gazette of RS," No. 96/2021), and the Regulation on Noise Indicators, Limit Values, and Methods for Assessing Noise Indicators and Harmful Effects of Noise on Human Health ("Official Gazette of RS," No. 75/10) Table 1, Appendix 2. The highest permitted level of external noise

Figure 9.11. shows the position of measuring points for noise testing in the environment.

Figure 9.11 Position of measuring points for noise testing in the environment