To: Ministry of Environment and Water of the Republic of Bulgaria

Sofia, 22 Mariya Luiza Blvd

Attn: Minister of Environment and Water of the Republic of Bulgaria

Subject: Environmental Impact Assessment (EIA) study prepared for the Project for the Construction of a Waste-to-Energy Plant on cadastral parcels 1420/1, 1420/4, 1491/1, 1541/1, 1541/2, 1552, 5824/1, 6513/1, 6513/2 on the cadastral map of the Prahovo settlement, municipality of Negotin, and phased construction of a Non-Hazardous Waste Landfill within the industrial chemical complex in Elixir Prahovo on cadastral parcels number 2300/1, 1491/1 and 1541/1 Prahovo, municipality of Negotin.

Your Reference: Letter Reg. No 04-00-949-36 dated on November 15th, 2024.

Date: December 24rd, 2024.

Dear Minister Petar Dimitrov.

Ladies and jentelman,

Within this letter we are submitting the answers related to Your respected letter Reg. No 04-00-949-36 dated on November 15th, 2024, with additional separate summary:

- Attachment 1_Executive Summary of the EIA for the subject project (Waste-to-Energy Plant and Non-Hazardous Landfill in Prahovo)

Additionaly, as the attachment to answer regarding the question from the scope of Waste Factor, we submitt the following:

- Attachment 2_List of acceptable EWC codes with maximal annual capacity for thermal waste treatment in the Waste-to-Energy Plant Prahovo (attachment to answer numbered as: 1.b, chapter Waste Factor)

Hopefully, you will find the level of provided details sufficient for full project impact comprehension.

Yours sincerely,

Ministry of Environment of Republic of Serbia

The answers related to Letter of the Ministry of Environment and Water of the Republic of Bulgaria Reg. No 04-00-949-36 dated on November 15th, 2024

WASTE FACTOR

1. **<u>In the "Notification to the Affected Party of the proposed activity under Article 3 of the Convention", the following information is missing:</u>**
   <u>"Type of waste by code and quantity, on an annual basis, to be generated during construction, to be treated in the incineration plant and to be generated after incineration."</u>

Answer:

The comment is well noted. Required data has been already provided in the dedicated sections of the submitted EIA (6.1 Overview of possible changes in the environment during the execution of the project & 3.4.1 Review of the type and amount of gases, water and other liquid and gaseous waste substances released during the construction of the facilities in question), but they will be more precisely specified as follows:

a) Type of waste by code and quantity to be generated during construction:

Estimated total mass/volume of waste to be generated on site, during the construction is given in the submitted EIA study, Table 3.46 and Table 3.47.

Table 3.46 List of expected construction waste and estimated quantities of waste to be generated on the site of the Waste-to-Energy Plant

EWC code	Description	Units	Estimated total mass/volume of waste to be generated on site
17	**CONSTRUCTION AND DEMOLITION WASTE (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)**		
17 01	**17 01 concrete, bricks, tiles and ceramics**		
17 01 01	Concrete	t	3
17 01 02	Bricks	t	0.5
17 01 03	tiles and ceramics	t	0.5
17 02	**wood, glass and plastic**		
17 02 01	Wood	t	3
17 02 02	Glass	kg	100
17 02 03	Plastic	kg	100
17 04	**metals (including their alloys)**		
17 04 01	copper, bronze, brass	t	1
17 04 02	aluminum	t	0.1
17 04 04	zinc	t	0.1
17 04 05	iron and steel	t	2

17 04 07	mixed metals	t	1
17 04 11	cables other than those mentioned in 17 04 10*	t	0.1
17 05	**soil (including soil excavated from contaminated sites), stone and excavation**		
17 05 03*	soil and stone containing hazardous substances	m³	1
17 05 04	soil and stone other than those listed in 17 05 03	m³	100
17 05 05*	Excavation containing hazardous substances	m³	10
17 05 06	Excavation other than that mentioned in 17 05 05*	m³	50,000
17 06	**insulation materials and asbestos-containing building materials**		
17 06 03*	other insulating materials consisting of or containing hazardous substances	kg	100
17 06 04	Insulating materials other than those specified in 17 06 01* and 17 06 03*	kg	100
17 08	**Gypsum-based construction material**		
17 08 02	gypsum-based construction material other than those mentioned in 17 08 01*	kg	100
17 09	**Other construction and demolition wastes**		
17 09 04	mixed construction and demolition wastes other than those mentioned in 17 09 01 and 17 09 02 and 17 09 03	kg	100
12	**WASTES FROM SHAPING AND PHYSICAL AND MECHANICAL SURFACE TREATMENT OF METALS AND PLASTICS**		
12 01	**wastes from shaping and physical and mechanical surface treatment of metals and plastics**		
12 01 13	welding wastes	kg	200

Table 3.47 List of expected construction waste and estimated amount of waste to be generated at the construction site of the Landfill for Non-hazardous waste

EWC code	Description	Units	Estimated total mass/volume of waste to be generated on site
17	**CONSTRUCTION AND DEMOLITION WASTE (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)**		
17 02	**wood, glass and plastic**		
17 02 03	Plastic	kg	1,000
17 05	**soil (including soil excavated from contaminated sites), stone and excavation**		
17 05 04	earth and stone other than those mentioned in 17 05 03*	m³	4,000
17 05 06	Excavation other than that mentioned in 17 05 05*	m³	36,000

In accordance with the legal regulations of the Republic of Serbia, as one of conditions for obtaining a Construction Permit, the investor is obliged to prepare Construction Waste Management Plan, which must be approved by the Ministry of Environmental Protection.

Additionally, In accordance with Article 158. of the Law on Planning and Construction ('Official Gazette of the Republic of Serbia', no. 72/2009, 81/2009 - amended, 64/2010 - decision of the US, 24/2011, 121/2012, 42/2013 - decision of the US, 50/2013 - decision of the US, 98/2013 - decision of the US, 132/2014, 145/2014, 83/2018, 31/2019, 37/2019 - other law, 9/2020, 52/2021 and 62/2023), the application for the issuance of a use permit is accompanied by a document on the movement of waste, i.e. a document on the movement of hazardous waste confirming that the waste was generated by construction and demolition (construction waste), handed over to the operator of the plant for the treatment or storage of waste, as well as other evidence in accordance with the regulation that regulates the procedure for the implementation of the unified procedure.

b) Type of waste by code and quantity to be treated in the incineration plant:

The maximal annual capacity of thermal waste treatment in the subject Waste-to-Energy Plant is limited to total 100,000 tons per year, cumulatively for all listed EWC codes that are anticipated as acceptable in accordance with the designed incineration technology, in respect to relevant EU and national regulation.

- List of acceptable EWC codes with addition of maximal annual capacity for thermal waste treatment (R1 operation) of all listed EWC codes is provided as Attachment 2 to this letter.

The data of maximal annual thermal treatment capacities determined for individual types of waste (EWC codes) are calculated in accordance with:

- anticipated aggregate phase and/or physical composition of waste, and
- maximal annual capacity of each waste dosing line/system designed for different waste aggregate phase and/or physical composition (i.e., liquid, sludge, solid and heterogeneous multiphase composition), as presented in the following table:

Waste dosing lines/systems		**Maximal annual capacity of each waste dosing line/system (in tons per year)**	
1	Line for dosing of liquid waste (from the liquid waste storage tanks)	liquid wastes	40,000
2	Line for dosing of sludge waste (from the sludge storage bunker)	sludge wastes	80,000
3	Line for dosing of pre-treated waste of heterogeneous composition (e.g., packaged liquid, solid and sludge wastes in IBC containers, barrels, etc., after fine grinding in an inert/nitrogen atmosphere)	fine grinded wastes of heterogeneous multiphase composition	80,000
4	Line for dosing of pre-treated solid waste (i.e., after shredding, from the solid waste storage bunker)	shredded solid wastes	100,000
Maximal annual thermal waste treatment capacity of the WtE Plant, total for all waste types / EWC codes (in tons per year)			**100,000**

In order to improve the overall environmental performance of the incineration plant, in accordance with requirements of BAT 9 and BAT 11 of the BATC WI 2019, detailed control of the physical and chemical parameters of waste deliveries intended for thermal treatment will be subject of pre-acceptance and acceptance procedures, in respect to relevant EU and national regulation.

Prohibited waste categories

We underline that the following waste categories are strictly prohibited from being treated at the subject project facility under any circumstances:

- Waste classified as explosive, flammable, infectious, or radioactive.
- Waste containing or contaminated with polychlorinated biphenyls (PCBs), polybrominated triphenyls (PCTs), or polybrominated biphenyls (PBBs).
- Waste containing cyanides, isocyanates, thiocyanates, asbestos, peroxides, biocides, cytostatics, or electronic waste.
- Waste substances in aerosol form, organometallic compounds, and aluminized paints.
- Waste containing persistent organic pollutants (POPs)

Limitations for the chemical composition of the simultaneously treated waste mixture

The thermal treatment on the boiler of the Waste-to-Energy Plant Prahovo is strictly governed by the technical design specifications, ensuring consistent compliance with the following defined limitations for the chemical composition of the simultaneously treated waste mixture:

- Sulfur (S): max 2%
- Chlorine (Cl): max 3%
- Organic halogenated substances (as chlorine): max 1%
- Fluorine (F): max 0.02%
- Mercury (Hg): max 10 mg/kg
- Moisture (H_2O): max 50%
- Ash: max 40%.

c) Type of waste by code and quantity to be generated after incineration and disposed on the Non-hazardous waste landfill:

The anticipated generation of a solidified waste amount is expressed in the EIA subsection 3.2.1.12 as follows: "The average expected quantity of solidificate production is 1.08 m3/h, while the maximum simultaneous logistical load of solidificate production is 3.08 m3/h. Taking into account the annual working time of 8300 h/year, the average annual production of solidificate for storage amounts to 8964 m3/year, i.e. the maximum 25.564 m3/year.".

A mass balance has been provided as a supplement to the EIA study, where the amount of solid residues intended for solidification has been provided in line 51, 52 & 53 of Table 15. The max one moment generated amount is given in the EIA subsection 3.2.1.12 as follows: "The maximum amount of residuals introduced into the facility is 3.1 t/h. From this position (reception site), the residuals are transferred by crane to the appropriate field in the facility." Please note that this is a moment maximum, while the overall mass balance depends on longer time operation and the exact waste to be treated.

Non-hazardous waste landfill is an installation designed for landfilling of stabilized and solidified waste residues from the subject Waste-to-Energy Plant, exclusively. Acceptance of solidificate for landfilling is predicated on demonstrating compliance with non-hazardous leaching criteria set for non-reactive waste class according to national and EU regulation. The operation will be guided in accordance with Regulation on disposal of waste on landfills ("Official Gazette of the RS", No. 92/2010)

EWC codes of solidificate, anticipated to be produced and landfilled on the Non-hazardous waste landfill are as follows:

- 19 03 06* - waste marked as hazardous, solidified
- 19 03 07 - solidified wastes other than those specified in 19 03 06

Maximal annual production of solidificate volume amounts to 25.564 m3/year, which multiplied with its anticipated maximum density of 1.5 t/m3, gives a maximal annual quantity of 38,346 t/year of solidificate for landfilling (as non-reactive / inert hazardous or non-hazardous waste), as expressed in the following table:

The maximal annual production of solidificate - Volume	m3/year	25,564
Max density of solidificate	t/m3	1.5
The maximal annual production of solidificate - Quantity	**t/year**	**38,346**

2. **<u>“What quantities of waste will be stored on site, per day.”</u>**

Answer:

The comment is well noted. Data provided in the following table presents the Waste-to-Energy Plant maximal capacity of thermal waste treatment (R1 operation) and maximal waste storage capacity (R13 operation), of all listed waste types / EWC codes, per day:

Maximal capacity (i.e., throughput) of the WtE Plant (R1, R13)	Max in tons per day
Maximal thermal treatment capacity of all waste types (R1) per day	408
Maximal storage capacity of all waste types (R13) per day	628

It has to be considered that the calorific value of the different waste types varies depending on their water and/or ash contents; and that the maximum capacity of the incinerator is not defined and limited by the waste throughput in tons per hour, but by the energy input in MJ per hour provided to the furnace in the form of waste.

Maximal thermal waste treatment capacity of all waste types (R1) is calculated based on the maximal thermal treatment capacity of 17 tons per hour of waste with calorific value 7 MJ, which multiplied with 24 hours gives a maximal thermal waste treatment capacity of 408 tons per day.

Maximal storage capacity (i.e., throughput) of all waste types (R13) is anticipated to be 628 tons per day, as a theoretically maximum in terms of simultaneous logistics operation, aligned with other operation capacities of the Waste-to-Energy Plant (i.e. storage, pretreatment, quality control, pre-acceptance and acceptance protocol).

The overall yearly maximal waste thermal treatment capacity of the installation is 100,000 tons per year.

3. **"The origin of the waste, will there be waste resulting from transboundary shipment and if so, from which countries?"**

Answer:

The origin of the waste is Serbia. According to the Law on Waste Management of the Republic of Serbia, the import of waste for disposal and utilization for energy purposes is prohibited. Operation R1, which involves the use of waste primarily as fuel or another means for energy production, falls under this category. Therefore, the import of waste for the purpose of R1 operations is not allowed in Serbia.

4. **"In view of the fact that a non-hazardous waste landfill is to be built at the installation, it is necessary to specify where and how hazardous waste generated by the incineration process and not eligible for acceptance at a non-hazardous waste landfill will be transferred."**

Answer:

The general environmental protection plan for regular operation, in the EIA section 8.3.3 specifies how testing, traceability and waste mapping is carried out, in order to execute corrective actions if necessary.

Non-hazardous waste landfill is designed and will be permitted for landfilling exclusively of waste which demonstrates compliance with non-hazardous leaching criteria set for non-reactive waste class according to national (Regulation on disposal of waste on landfills ("Official Gazette of the RS",No.92/2010) and EU regulation (Landfill Directive 1999/31/EC, Council Decision 2003/33/EC). Compliance will be tested in accordance with legally specified standard NEN 7345 or equivalent.

In case of non-compliance with the criteria set for disposal to Non-hazardous waste landfill, the reactive hazardous waste will be directed to another recipient, transported using trucks according to hazardous waste transport regulations. The recipient will be an authorized operator of the hazardous waste landfill and/or underground mine operator permitted for acceptance and disposal of such waste streams.

The comment is well noted, and the explanation will be further elaborated in the same EIA chapter.

5. **<u>“In describing the chosen technology for the thermal treatment of waste, no mention is made of how the requirements of Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) - the Directive, and in particular Article 50(3) - that each combustion chamber of the waste incineration plant be equipped with at least one additional burner will be complied with.”</u>**

Answer:

Requirements of Article 50(3) of the Directive 2010/75/EU are completely fulfilled in design of the subject project, as well as the BAT requirements for IPPC installations laid out in the Best Available Techniques Conclusions (BATC) on Waste Incineration set into force by the EU in 2019.

In the EIA section 3.2.1.8.5 Ignition fuel and auxiliary fuel system it has been stated: "Two natural gas burners with a nominal power of 2x12 MW are planned for boiler start-up and operation with low-calorie fuel. The burners are only used to start and stop the boiler and in case the temperature in the furnace drops below 850 °C, while in regular operation the burners are only used to introduce secondary combustion air."

In subsection 8.3.2.2 Waste thermal treatment and production of thermal energy in the form of steam it has been additionally stated: "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.". The solution embodies 2 burners providing 100% redundancy.

6. **<u>“In addition, on the basis of Article 50(4)(c) of the Directive, waste incineration plants and waste co-incineration plants shall use an automatic system that prevents the waste feed whenever continuous measurements show that any of the emission limit values are exceeded due to the upset or failure of the waste gas treatment systems.”</u>**

Answer:

Requirements of Article 50(4)(c) of the Directive 2010/75/EU are completely fulfilled in design of the subject project, as well as the BAT requirements for IPPC installations laid out in the Best Available Techniques Conclusions (BATC) on Waste Incineration set into force by the EU in 2019.

In the EIA subsection 8.3.2.2 Waste thermal treatment and production of thermal energy in the form of steam it has been specified that:

"The incineration plant has and uses an automatic system to prevent the feed 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 following requirements will be hard coded in the DCS system of Waste-to-Energy Plant.

COMPONENT WATER

1. **<u>"The EIA Report for the project addresses the potential impacts on water from the implementation and operation of the project. I support the measures proposed in the EIA Report to prevent, mitigate and compensate as fully as possible for the adverse effects on water and express a positive opinion on the report with regard to the water component, as well as I would like to request the results of the surface water quality monitoring to be submitted to the Ministry of Environment and Water of the Republic of Bulgaria."</u>**

Answer:

The request of quality monitoring access is noted and will be implemented in the EIA related chapter and Monitoring plan. Investor is pointing out availability of current measurement quality which is given as supplement to the submitted EIA study.

According to the information provided in the EIA report, the following points are planned for sampling from the Danube River of discharged wastewater from the site:

- PV1: on the Danube 150 t upstream of the wastewater collector inlet with GPS coordinates: N 44°17'27.50'' E 22°36'58.08''.
- PV2: on the Danube 100 m downstream of the wastewater collector inlet with GPS coordinates: N 44°17'21.08'', E 22°37'25.39''.

Measurements at the sites will be carried out 4 times a year.

AMBIENT AIR COMPONENT

1. **<u>"The EIA report (1. ENG - EIAS FINAL eng.pdf) on page 401 presents the boiler parameters to be used as input data for the modelling. In Table 6.10 "Characteristics of the boiler plant emitter (W-C14)" a clerical error has been made, a value of 70 Nm3/h is given for the flue gas volume, this should be 70 000 Nm3/h."</u>**

Answer:

Indeed, this is correct, the mistake occurred during the translation process. It will be corrected in revision.

2. **<u>"In Table 3.49 "Review of the type and maximum concentration of emitted pollutants at the boiler plant emitter", page 251 of the EIA report, the mass flow values of Cd+TI and Sb+As+Pb+Cr+Co+Cu+Mn+Ni+V need to be revised. Our calculations show that the mass flux values for these pollutants set out in the table are an order of magnitude higher than those that would correspond to the actual maximum emissions."</u>**

Answer:

Indeed, this is correct. The values for Cd+TI mass flux and Sb+As+Pb+Cr+Co+Cu+Mn+Ni+V, will be corrected to 0,0007 kg/h and 0,007 kg/h, respectively.

The modelling results (concentrations of regulated pollutants in the ground layer) show that these will not lead to exceedances of the standards for the protection of human health set out in European and national legislation.

3. **<u>"I would like to note that there are no modelling results for emissions of heavy metals - Cd+TI and Sb+As+Pb+Cr+Co+Cu+Mn+Ni+V."</u>**

Answer:

Indeed, this is correct. The location is not historically burdened by such contamination, thereby the relevance of BAT aligned emissions as a contributor to cumulative deterioration of air quality are limited. Moreover, the national & EU regulation for air quality do not specify the category as one with defined limit values.

As the limit values from the aspect of air quality have not been defined for the aforementioned groups of components, consequently it would not be obvious which values to use as comparative basis for the evaluation.

HUMAN HEALTH

1. **<u>"There is no dedicated section in the EIA Report to analyse the potential for transboundary impacts on human health, including accidents with hazardous substances, including health aspects and measures to prevent and mitigate them. The EIA Report does not sufficiently address the following issues which have the</u>**

potential for harmful effects in a transboundary context and the relevant sections should therefore be completed:

Answer:

The comment is well noted. The necessary analyses of potential impacts on human health have already been provided within the framework of the EIA supplement studies and their conclusions have been elaborated in the dedicated EIA sections, but they will be more preciously specified in transboundary context as follows:

a) **Estimated assessment of the potential for the transboundary spread of odors from the activities of the investment proposal."**

The maximal odor emission could be expected when the boiler is not in operation, considering that the ambient air from the inside spaces of the Waste-to Energy pretreatment and storage facilities is used as a secondary air for the combustion process during regular operation. In a scenario of emissions during irregular operation, when boiler would not be in operation, the odors would partially be suppressed using a carbon filter. For such a case a dedicated air study executed by Faculty of Mechanical Engineering, University of Belgrade (Study of the impact of the waste pretreatment filter system and activated carbon filter within the Waste-to-Energy Plant on the air quality of the wider location of the chemical industry complex in Prahovo) comprised state-of-art diffusion modelling of TVOC as a surrogate model compound for odor release. The highest TVOC concentrations obtained by modeling, for averaging periods of 1h, 3h and 24h, can be observed immediately next to the northern border of the property and were 109 μg/m³, 36.9 μg/m³ and 5.59 μg/m³, respectively. Considering the indicated limit value (400 μg/m³) for TVOC concentration in indoor air, it can be concluded that the values obtained by the model are far below the specified limit. During regular operations, i.e., boiler in operation, the results conclusively demonstrate that TVOC concentrations (as indicator of odor emissions) obtained by modelling are approximately 200 times lower in worst circumstances than extremely stringent indicated limit value of 400 μg/m³ for indoor air quality. Thus, the emissions and potential odors are considered negligible on the Industrial complex.

Moreover, the study concludes: "Considering that due to the location of the chemical industry complex in Prahovo, there is a potential effect of cross-border pollution, and bearing in mind the trend of decreasing ground-level pollutant concentrations for all averaging periods, where already after a few hundred meters from the boundaries of the complex the concentration becomes extremely low, it can be concluded that the potential cross-border effect is practically negligible.". In practice, within cited study given figures (3.15 - 3.22), values anticipated in the territory of Bulgaria are below the scale of provided concentration (less than 0,5 μg/m³ for a one-day averaging period).

b) **"Identification of new risk factors and harmful substances due to cumulative impact of air pollutants in the area after the implementation of the investment proposal."**

The EIA study conclusively demonstrated that air quality does not deteriorate in case of the subject project even on the production location, with regards to EU and legislation issued by Republic of

Serbia. Already active emission sources are dominating the air quality, while the added emissions related to Subject Project execution would be almost negligible. The air quality with respect to SOx emissions could be locally (existing industrial complex area) an extremely seldom concern even under extremely unfavorable climate conditions. Naturally, with increase in distance from the emission source the level of exposure of population to potentially harmful substances declines. This is also demonstrated in the report using state-of-art diffusion modelling with a network covering 50 x 50 km reception area. Most air polluting substances to be emitted by the facility are already emitted from the existing industrial infrastructure in the area. Exceptions are potential PCDD/F, PCDD/F+ dioxins as PCBs and Hg emissions, characteristic for this industry with an impact on health as expressed in the EIA section 6.2.2.2.

In order to minimize exposure, it is crucial to ensure appropriate incineration conditions in order to reduce dioxin emissions and integrate sensitive and critical emission control systems, as required by European Union and RS legislation and envisaged by the subject project.

Another aspect important for controlling emissions is the composition and variation in waste intended for thermal treatment, which affects the concentration of pollutants in emissions. Therefore, the subject project envisages strict control of incoming waste materials, examining of its composition and defining the appropriate working protocols, all in accordance with the defined conditions for thermal treatment in the subject fluidized bed boiler plant.

Subject Waste-to-Energy Plant completely respects requirements for the Operating Conditions regulated in Article 50 of the Directive 2010/75/EU, including Article 50(2) which states: “Waste incineration plants shall be designed, equipped, built and operated in such a way that the gas resulting from the incineration of waste is raised, after the last injection of combustion air, in a controlled and homogeneous fashion and even under the most unfavorable conditions, to a temperature of at least 850 °C for at least two seconds.”

Moreover, in the EIA section 3.3.1.5 the following is defined: "The project documentation defines that waste containing more than 1% of halogenated organic substances expressed as chlorine cannot be treated at the boiler. It is strictly forbidden to accept waste that is explosive, flammable, infectious, radioactive, waste materials containing or contaminated with polychlorinated biphenyls (PCB) and/or polybrominated triphenyls (PCT) and/or polybrominated biphenyls (PBB), waste containing cyanides, isocyanates, thiocyanates, asbestos, peroxides, biocides, cytostatic, electronic waste. Additional restrictions on admission to the plant in question are waste materials in the form of aerosols, as well as organometallic compounds (spent metal-based catalysts, or organometallic wood preservatives) and aluminized paints."

A detailed description of the composition of the waste that can be thermally treated, and the conditions of incineration and treatment of waste gases is given in chapter 3 of the EIA study.

In the submitted EIA study, it is also stated that in accordance with requirements of BAT 9 (as well as BAT 11) of the BATC WI 2019, detailed control of all relevant parameters of waste intended for thermal treatment will be subject of pre-acceptance and acceptance procedures, in respect to relevant EU and national regulation.

The authors point out that incinerators are conclusively recognized by the industry and EU member governmental bodies as dioxin and furan destruction facilities, since they destroy more dioxins and furans than they produce, as demonstrated in the following linked documents:

- https://www.bmk.gv.at/dam/jcr:40b93468-8ffc-4581-a7f3-a0dedec04350/Whitebook_Waste_to_Energy.pdf (see page 52)
- www.abfallratgeber.bayern.de/publikationen/abfallbehandlung/doc/muellverb.pdf (see abiding 20)
- https://epub.sub.uni-hamburg.de/epub/volltexte/2009/2846/pdf/dioxinbilanz.pdf (see Tabelle 25)

These studies conclusively demonstrate that such facilities destroy named pollutants and as such contribute to the general environment conditions, in other words, this is a direct contribution to human health.

A similar conclusion can be found for heavy metals and Hg, where official findings of the German government demonstrate a net positive effect of incineration it the following document:

- (https://www.itad.de/wissen/studien/2005_abschied_von_der_dioxinschleuder.pdf)

The cumulative air emission impact on air quality in the EIA Study is modeled with substantially exaggerated parameters, as the modeling assumptions considered that all emissions will be simultaneous through each emission source in its maximum limit values and under most unfavorable meteorological conditions. Nevertheless, according to the modelling results, performed air emission study comprehensively concludes that the impact of the subject project installations would be marginal with limited synergistic effect. The potential influence on the larger area air quality is marginal, meaning that there is no potential influence in neighboring area of Bulgaria.

In reality, Elixir intends to decarbonize its energy sources and use Waste-to-Energy source as a substitute for fossil fuels. Thereby, it should be pointed out that by using the Waste-to-Energy Plant instead of a coal boiler the emission situation will in general improve in comparison with current practices. Namely, if one compares PM emission from existing source E3 (please be referred to supplementary study issued by Faculty of Mechanical Engineering, University of Belgrade) and potentially new sources E18, E19 & E20, it can be concluded that net PM emissions reduction of 0,276 kg/h (23%) can be expected. Executing the same exercise for SOx and CO, the net reduction of emissions of 42,72 kg/h (95%) and 0,839 kg/h (19%), can be expected respectively.

Finally, the authors draw attention to the positive environmental and health aspects of the Waste to Energy plant in relation to the current waste management practice in Serbia, disposal at landfills which includes high fire risks and consequent pollution, as expressed in:

- https://www.activity4sustainability.org/wp-content/uploads/2024/08/WHITE-BOOK-ON-WASTE-TO-ENERGY-IN-SERBIA.pdf
- https://www.activity4sustainability.org/wp-content/uploads/2024/03/Supplementary-resources-FINAL.pdf

c) **<u>“Assessment of the combined, complex, cumulative and remote impact of risk factors in emergency situations and incidents; human health risk assessment and proposal of health protection and risk management measures.”</u>**

In the EIA chapter 7, both accidents inflicted risks related to Waste-to-Energy Plant and Non-hazardous waste landfill are modelled in detail with issuing a subsequent protection requirement. These requirements are expressed in the EIA chapter 8, section 8.2 after conducting vulnerability analysis in the EIA section 7. The theoretical improbable most damaging scenarios are modeled and given within the EIA section 7 (Table 7.18 and Table 7.15).

Table 7.18 Assessment of the risk of accidents at the Waste-to-Energy Plant according to defined accident scenarios

Overview of accident scenarios	Probability	Consequences	Risk
1. Accidents at the liquid waste transfer point.	low	serious	medium risk
2. Accidents at the waste storage, i.e. in reception bunkers or bunkers for mixing solid hazardous waste.	low	significant	low risk
3. Fire with fuel tanks (upstairs).	low	significant	low risk
4. Uncontrolled discharges of liquid waste from IBC containers.	medium	significant	medium risk
5. Accident situations with waste sludge.	low	significant	low risk
6. Accident situations on the boiler plant and natural gas installation.	medium	significant	medium risk
7. Uncontrolled discharge of particulate matter from bag filters in the boiler plant.	medium	of little importance	low risk
8. Forced flue gas discharge to the stack without cleaning in the scrubber system.	medium	of little importance	low risk
9. Accidental situations on activated carbon dozers.	low	significant	low risk
10. Accidents with ammonia water.	medium	significant	medium risk
11. Accident situations in the stabilization and solidification facility W- C12.	low	significant	low risk
12. Modelling the effects of the hazardous substances emission in accidental situations at the Waste-to-Energy Plant to the watercourse of the Danube.	medium	of little importance	low risk

Accident effects were modelled using appropriate mathematical models and the ALOHA^{R} (Areal Locations of Hazardous Atmospheres) software program, developed by US EPA ALOHA^{R} and designed for professionals dealing with chemical accident issues to ensure quality assessment of vulnerable zones in case of chemical accidents and to enable quick responses to minimize consequences.

12 accident scenarios have been analysed as potential Waste-to-Energy Plant accident, classified in accoldance to level of potential consequences:

* Possible levels of accidents are expressed in five levels, as follows:

- **Level I of the accident:** level of hazardous installations - consequences of the accident limited to a part of the plant – there are no consequences for the entire complex,
- **Level II of the accident:** level of the complex – consequences of the accident limited to the entire complex - there are no consequences outside the boundaries of the complex,
- **Level III of the accident:** the level of the municipality or city – the consequences of the accident are extended to the municipality or the entire city,
- **IV level of the accident:** regional level – the consequences have spread to the territory of several municipalities or cities.
- **Level V:** international level – the consequences have spread beyond the boundaries of the RS.

Table 7.15 Estimation of the level of accidents at the Waste-to-Energy Plant according to defined accident scenarios

Number of Scenario	Accident Scenario	Accident level*
1	Accidents at the liquid waste transfer point.	II
2	Accidents at the waste storage, i.e. in reception bunkers or bunkers for mixing solid hazardous waste.	I
3	Fire with fuel tanks (upstairs).	I
4	Uncontrolled discharges of liquid waste from IBC containers.	I
5	Accident situations with waste sludge.	I
6	Accident situations on the boiler plant and natural gas installation.	I
7	Uncontrolled discharge of particulate matter from bag filters in boiler plant	II
8	Forced flue gas discharge to the stack without cleaning in the scrubber system.	II
9	Accidental situations on activated carbon dozers.	I
10	Accidents with ammonia water.	III
11	Accidental situations in the stabilization and solidification facility W-C12.	II

12	Modelling the effects of the hazardous substances' emission in accidental situations at the Waste-to-Energy Plant on the watercourse of the Danube.	**III**

The most important events are accidents classified as level II and level III. There are no accidental scenarios classified as level IV or level V, with full respect to the distances of the cross boarder municipalities of Bulgaria and Romania.

Accident clasified as level III, with the the highest reach which extends the boundaries of the subject project complex, is linked to accidents involving ammonia water, as the furthest range for toxic concentrations is 680 m. Effects of subsequent ignition remain within 11 m from the spill site, within the boundaries of the subject project complex.

From a perspective of extra precaution in the modelling step, a special Scenario number 12 (accidental situations at the Waste-to-Energy Plant) has been set to assess the impact of a potential accident on river Danube. A mathematical model for a continuous pollution source was applied, based on the FATE software (Faculty of Civil Engineering, Podgorica, https://www.ucg.ac.me.objava_130961) development. In the case of ammonia vapors, the fractions of ammonia, HCl, SO2 and NOx dissolving in the river surface were calculated based on the deposition velocity, whose value in this case is taken as 0.01 m/s (S.Hanna et al., Handbook on Atmospheric Diffusion, Oak Ridge, 1982.) – the effect of "acid rain". On the other hand, In the case of total particulate matter (PM), the portion of PM reaching the Danube River was calculated based on the deposition fraction flux from the turbulent diffusion equation, based on the calculated deposition velocity of the mean PM particle diameter.

The modelling results shown that the pollutant levels (PM and recalculated values of NH3, HCl, HF, SO2 i NOx) are far below the acceptable values, meaning that accident situations at the Waste-to-Energy Plant would not lead to pollution of the Danube River even in the worst-case scenario. as concluded in the following paragraph (page 516):

"Applying the above equation to the input parameters, it is concluded that the calculated pollutant levels (PM and recalculated values of NH3, HCl, HF, SO2 i NOx) are far below the previously stated values, meaning that accident situations at the Waste-to-Energy Plant do not lead to pollution of the Danube River from pollutants released into the air."

All the measures found to be necessary considering the subject project impact assessment, regulation and technology required are presented in the EIA chapter 8. included measures which must be taken to protect all factors of the environment and human health (plans and technical solutions for environmental protection), which relate to the construction, regular operation, termination of use or removal of the subject project, as well as measures for accident prevention during construction and operation, accident response measures and elimination of the consequences of the potential accident.

d) "**Taking into account the envisaged discharges of wastewater into the Danube River, an assessment of the future impact of the implementation of the investment proposal on the surface and groundwater and soils on the territory of the Republic of Bulgaria and hence on all water sources used for drinking and**

<u>drinking purposes in the affected Bulgarian settlements, with or without an established sanitary protection zone, which are or could be affected as a result of the operation of the facilities.”</u>

Authors point out that in terms of both, air pollution and water (read Danube) pollution a cumulative approach has been adopted. Namely, in the EIA subsection 6.2.1.1.6 (and air quality modelling assessment studies provided as appendix) a cumulative emission study has been done considering current emissions from the existing installations of Elixir Prahovo. Similarly, in the modelling approach described in the EIA subsection 6.2.1.2.1 the effects on Danube water quality have been assessed cumulatively considering treated wastewater quality of the existing installations within the area of industrial complex in Prahovo.

By comparing the results of the Danube River pollution modelling due to the discharge of collective wastewater from the existing Elixir Prahovo complex and the addition of the future subject project complex, it can be observed that no parameters exceed the concentration limit values of the tested parameters. Moreover, it should be borne in mind that based on the results of the "zero state" of the Danube River water quality, it can be stated that in its current state there is no to negligible (measured or assigned values noted to be below the detection limit are provided in EIA page 423) load of the polluting substances characteristic for expected wastewater to be discharged from the future subject project complex. Bearing in mind the above, as well as the fact that all pollutants in wastewater from the subject project installations will be below the Emission Limit Value (ELV) prescribed by the conclusions on the best available techniques and BREF WI documents from 2019. (Commission implementing decision (EU) 2019/2010 of 12 Nov. 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration), it can be stated that after putting the subject project into operation, there would be no cumulatively higher values of the concentration of polluting substances in the collective wastewater discharged into the Danube River. Flow modelling additionally shows that concentrations already 100 m downstream from the wastewater outlet are negligible. At 100 m downstream from the outlet is the relatively highest load (in relation to the limit value) of chemical Oxygen Demand (COD), which is 22 times less than defined by the Regulation on limit values of polluting substances in surface and underground waters and sediment and deadlines for reaching them (Official Gazette of RS, No. 50/2012).

On the other hand, among the parameters not regulated by the Regulation, the highest relative load (in relation to the limit value) is Tl (Thallium), which is 1667 times less than the concentration prescribed by the conclusions on the best available techniques and BREF WI documents from 2019 (Commission implementing decision (EU) 2019/2010 of 12th November 2019 establishing the best available techniques conclusions (BATC), under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration (notified under document C(2019) 7987)).

Additionally, modelling the effects of pollutant emission into the air from the subject project even under the most unfavorable weather conditions, and in the case of accidental situations with the most damaging scenarios of air pollutants release, didn’t indicate any impact on the quality of Danube.

Determined concentrations 100 m and 200 m downstream of the treated wastewater discharge point are negligible in concentration and to a large level barely if at all detectable. The study results conclusively showed that there would not be any violation of emission limits outlined for such installations and, more importantly, deterioration of Danube water quality as a consequence of the subject project execution.

After expressing all the issued facts, it is concluded that there cannot be any harmful influence on the River Danube which could in any way have an effect on population health neither of Negotin municipality nor the cross-border municipalities.

Considering the conclusions that Danube quality would not deteriorate as a consequence of the subject project implementation, it can be concluded that there are no possibilities that any downstream connected river system and/or connected underground water sources could be affected, nor could any associated impact on human health be expected.

In all modelling approach it has been demonstrated that the effect on air and water quality in Bulgaria by implementation of the subject project would be negligible. Therefore, this conclusion stands for any transboundary location in Bulgaria as well.

e) <u>"A dedicated section, based on the other sections of the EIA report should be prepared, analysing the potential for transboundary impacts on human health and measures to prevent and mitigate them."</u>

The comment is well noted. Dedicated section will be prepared and implemented in the EIA study, as the summary of analyzed potential transboundary impacts on human health and measures to prevent and mitigate them.