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BOSNIA AND HERZEGOVINA BANJA LUKA DISTRICT HEATING

NON-TECHNICAL SUMMARY

Bosnia and Herzegovina

Banja Luka District Heating Project

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1 INTRODUCTION

The district heating (“DH”) system of Banja Luka covers 10.7 km² or approx. 44%, which makes the DH system of the City the largest one in Republika Srpska (RS). The rest of the City uses other heating solutions (electricity or individual central heating fuelled by pellets, or wood/coal burning stoves for heating). The current DH system is supplied with heat from three heating plants: the main plant which includes four heavy fuel oil (“HFO”) boilers, in addition to two district biomass plants constructed in 2014.

The DH system of the City has been experiencing serious issues. The system was built in 1970s, and has become technically and technologically out-dated. The purchase price of HFO has been fluctuating in the past years, with a negative effect on the business operations of the existing DH company (Public Company “Toplana a.d. Banja Luka”), which has accumulated unsustainable levels of debt and payables to fuel oil suppliers. Customer dissatisfaction has increased due to poor quality of services, as a result of which the company lost 13% of its customers since 2011. In addition, the DH system which uses HFO as fuel is a major polluter of air in the City.

The strategic and planning documents in the City¹ have recognized the need to replace HFO with renewable energy sources in heat generation and to modernize the existing DH system. Furthermore, the conducted analysis of options to rehabilitate the DH system in the City² shows that the use of biomass in heat generation is feasible. Aware of the need to move towards biomass as a renewable energy source, in 2014 the City built two district biomass plants to partially replace HFO with biomass (wood chips).

Based on the identified need for modernization of the DH system and the need for fuel substitution, the City decided that the optimal model for introducing adequate technology for heat generation, modern technologies for managing and optimization of the distribution network, professional personnel for efficient management of the DH system and ensuring the financial means necessary for building a biomass plant is to select a strategic partner. In 2017, the City entered into a public procurement procedure to select a private strategic partner. In May 2017, the City selected the company IEE Banja Luka (“IEE”) as its private partner and created a new DH company “Eko Toplane Banja Luka” (the “Company”). The Company is owned 51% by IEE Banja Luka, while the City holds a minority stake of 49%.

The existing DH company will provide DH services until 31 December 2017, after which it will be put into hibernation and wound down. A Retrenchment Plan is drafted by the City of Banja Luka to address retrenchment issues, and the Retrenchment Plan will be implemented during the Project with semi-annual reporting to the Bank. Currently, the existing DH Company employs 134 people, of which 39 people will be redundant. All employees considered as redundant will be entitled to a fee that will be paid dependent on the employees’ length of service, and will receive support to gain additional skills that will meet labour market needs. Also, redundant employees will receive support to develop and implement self-employment and employment projects.

The new company will build, own and operate a new heat generation plant estimated to cost up to EUR 16.3 million, and also maintain and operate the existing DH network including heat metering and the billing system. The new plant will be located close to the HFO plant (located on the Vrbas river bank in the eastern part of the city), on the same river bank. It will be connected to the DH network through the existing boiler plant. The new plant is to be made up of 10 boilers of 4.9 MWt each, i.e. 49 MWt in total. With this approach it is planned that the existing HFO boilers would be held only in reserve. The network will remain in the City’s ownership. The existing biomass boiler plant (two boilers) of 16 MWt will remain in the ownership of the City and will be leased to the Company.

¹ The *Development Strategy* of Banja Luka (2007-2019); the *Sustainable Energy Action Plan* of Banja Luka (2010); the *Local Environmental Action Plan* of Banja Luka for the period 2016-2021; and the *Spatial Plan* of Banja Luka (March 2014)

² *Rehabilitation and Modernization of the District Heating System in the City of Banja Luka – Focus on Energy Efficiency, Rapid Assessment & Response Plan* (May, 2016)

EBRD is considering providing a loan of EUR 8.25 million to the City, of which the City will invest EUR 7.5 million as part of its minority equity stake in the Company, and EUR 0.75 million will be invested as working capital for the initial purchase of biomass fuel.

2 PROJECT DESCRIPTION

New Biomass Heating Plant

The Project includes the construction of a 2,460 m² biomass heating plant with 12 boiler lines (10 to be in operation + 2 in reserve). The facility is a combination of reinforced concrete and steel construction, coated with thermal insulating panels. The facility will consist of 4 units: command-operative unit, silo stations (12 siloes, 150 m³ each), boiler line 4.9 MW each (12 pcs) and area for auxiliary equipment. On the south side of the building a reinforced concrete plateau of 648 m² is planned for as space for filter units and chimneys. The system will operate at a water temperature of 80/110 °C and working pressure of 8 bar.



Figure 1: Exterior Appearance of the Planned Biomass Heating Plant

The Project involves the installation of sophisticated bag filters that perform flue gas scrubbing to minimum values (5 µg /m³, while the legal limit is 20 µg /m³).

The facility of the heating plant will be connected to the existing municipal water supply and sewerage systems. The process (technological) water used in the production process will be transported from the existing basin of soft water located at the existing HFO heating plant via the new pipeline that will be placed along the hot water pipeline route.

New Hot Water Pipeline

The connection of the new heat source and existing pumping station in the old heating plant is planned through a 550 m long pre-insulated pipeline. This hot water pipeline is designed for capacity increase of 10 MW in the new heating plant.

Biomass Storage Area (Logistics Centre)

For the purpose of supplying the new heating plant with woodchips, a dedicated logistics centre with an area of approx. 15,000 m² is planned within the "Incel Business Zone" Banja Luka which will serve as the central point for storage and processing of woodchips prior to its transport to the new biomass plant. The distance from the plant is approx. 5 km, and local transport infrastructure allows the use of heavy vehicles. The land plot is to be partially asphalted in the area of manipulation of vehicles and mechanization. The woodchips will be stored in a covered area of approx. 2,000 m². A mobile container facility is planned for the workers on-site, with the necessary installations and equipment for everyday operations.

Planned Duration of Construction Works

The planned duration of construction works is 7.5 months from the day of obtaining the Construction Permit, which was issued in August 2017, and construction is currently underway. Completion of construction works is expected before the new heating season.

Status of Project Activities

The City of Banja Luka conducted a public procurement procedure in March 2017 to select a private partner to establish a joint company to construct and finance the operations of the planned new biomass plant. IEE Banja Luka was selected as the private partner. A Business Plan was developed in April 2017. A Strategic Partnership Contract was signed between the City and IEE, and the new DH company "Eko Toplane Banja Luka" (the "Company") was officially founded in May 2017. The Company's responsible person was appointed.

A 15-member Project Team was set up during May 2017, consisting of representatives of the Company, IEE, the City and the company Petrol. The Project Team holds regular periodical meetings to discuss the implementation of the Project.

In the period from May to September 2017, the necessary permits and concessions were obtained.

Preconstruction activities related to removal of vegetation, excavation of earth material and levelling of the site, and construction activities up to the ground level began officially on 1 June, 2017.

Due to the fact the new plant will be constructed on a state-owned land plot, no expropriation/land acquisition is required.

For storage of large amounts of biomass and production of wood chips, the Company signed a lease contract with "Incel Business Zone" Banja Luka in July 2017.

During August 2017, the Company signed a framework agreement with the Public Company "Forests of RS", the FSC-certified supplier, for the procurement of biomass in an amount of 80,000 m³ per year during the next ten years. The Company will adopt and implement a sustainable biomass fuel procurement policy, and the biomass material is planned to be procured locally to ensure that only biomass fuel of legal and sustainable origin is used. The biomass fuel supplied will contain a significant proportion of wood chips from sawmills and biomass waste materials from wood processing industry.

Upon completion of the Project, the Company will be the only provider of district heating services in the City of Banja Luka for more than 20,000 citizens.

Permits for Project activities

According to RS legislation, district heating facilities are required to have an **Environmental Permit (EP)**. EPs are issued for a period of 5 years. Industrial plants for production of hot water with a capacity of 20 MW or more are not automatically subject to an obligatory EIA. Such projects are screened by the RS Ministry of Spatial Planning, Civil Engineering and Ecology in each particular case to decide whether an EIA is necessary. The Ministry may decide to require an EIA if a project may have significant environmental impacts. The EP for the Project was issued by the RS Ministry of Spatial Planning, Civil Engineering and Ecology (MSPCEE) in July 2017. A screening procedure was undertaken by MSPCEE, as the first stage of the permitting process. The procedure involved the development of a *Preliminary Environmental Impact Assessment* submitted to MSPCEE. Upon review, MSPCEE issued a decision in June 2017 stating that a full EIA is not required for this type of project. Accordingly, the Company developed a Local E&S Study for construction of the new biomass heating plant (10 x 4.9 MW) with accompanying facilities, and submitted it to MSPCEE, based on which MSPCEE issued the EP.

The **Construction Permit (CP)**, required prior to the start of construction activities, was issued based on the Main Design for construction works, by MSPCEE in August, 2017. Prior to the CP, the Company obtained the **Location Permit** issued by the MSPCEE in May 2017, which enabled the start of preconstruction activities related to removal of vegetation, excavation of earth material and levelling of the site.

The Company also holds a **Water Consent** for the Project, issued by Public Enterprise "Vode Srpske", Bijeljina in July, 2017.

During 2016, the old DH company started the abstraction and conditioning of water in a filter plant at the location of the HFO plant in order to avoid the use of large quantities of potable water for heat production.

The Company "Eko Toplane" intends to continue abstraction of water from three wells located in the industrial area of the old HFO plant. The Company is not required to obtain an EP for water abstraction in the amount of 200-230 m³/day from the three wells, as the threshold defined by national legislation is >240 m³/day of water abstracted by plants and facilities for abstraction and processing of groundwater, water processing and packaging of water in the capacity of >10,000 L/h. For the planned use of water in preparation of heat for the heating system, the Company will need to obtain a **Water Permit** from the authorized institution Public Enterprise "Vode Srpske", Bijeljina.

Upon completion of necessary construction activities, the Company will need to obtain a **Use Permit** for all new facilities and equipment following construction/installation of new equipment.

Project Relevant Concessions

According to the *Law on Concessions of RS*, concessions are granted for the construction and operation of power generation facilities with an installed capacity over 250 kW, with the exception of energy facilities on biomass and bio-gas and solar plant with photovoltaic cells on buildings regardless of installed capacity. Therefore, the proposed Project is exempt from the obligation of signing a concession agreement.

The Company intends to continue abstraction of water from three wells located in the industrial area of the old HFO plant. For water abstraction in the amount of required 200-230 m³/day to feed the DH system, the Company is required to obtain a concession for abstraction of water in the amount of approx. 70,000 m³/year.

Alternatives considered

No alternatives to this Project were considered in the available existing technical documentation provided by the Company.

However, the Project itself represents an alternative solution to the existing heat supply from the old HFO heating plant. During 2016, an analysis³ conducted indicated that it was necessary to switch from HFO to biomass in the DH system in order to reduce air emissions and avoid dependence on the HFO market. The analysis also showed that it is necessary to rehabilitate the distribution network to reduce heat and water losses and to introduce a billing system based on actual energy consumption for all customers.

The construction of the biomass heating plant has been analysed and foreseen by the spatial planning and study documentation of the City of Banja Luka. The Spatial Plan of RS (for the period until 2025) and the Spatial Plan for the City (2011-2030) both promote the need to use biomass for heat generation. The latter states that a new heating plant may be constructed in favourable locations in the north or south parts of the City, and that other more favourable locations may also be identified. In April 2017, a study⁴ was developed to evaluate different spatial possibilities for installation of a new biomass plant. The factors considered during decision-making were ownership of the new location (preferably state-owned) and the general condition of the location, and the location south from the existing HFO heating plant was selected as the most favourable solution.

The only possible alternative to the proposed Project is the 'do-nothing' option. The 'do-nothing' option is considered unfavourable, as it would lead to the unwanted 'status quo' of the current DH system. Namely, no improvements would be made to the system, customers' satisfaction will remain low, and no reduction of air emissions could be expected.

³ Rehabilitation and Modernization of the District Heating System in the City of Banja Luka – Focus on Energy Efficiency, Rapid Assessment & Response Plan, May, 2016

⁴ Study of Spatial Possibilities for Construction of the 49 MW Heating Plant in Banja Luka, "IG" Institute Banja Luka, April 2017

3 BASELINE CONDITIONS

Ground and Surface Water Quality. The Vrbas River basin is the most important water resource in the western part of RS, as three quarters of the City are located in its catchment area, and the longest tributaries of the region are Vrbanja and Suturlija. Vrbanja flows into the Vrbas River 1.2 km downstream from the location of the new plant, from the south-east side. River Vrbanja is approx. 400 m distant from the planned logistics centre. Based on its purpose and degree of pollution, the River Vrbas is classified as class II (i.e., water that may be used as drinking water after adequate treatment, and water that may be used in its natural state for bathing and recreation, water sports, and for growing cyprinid fish species). There are no data on groundwater quality.

Climatic Factors and Climate Change. According to official data from the Republic Hydrometeorological Institute of RS, Banja Luka is characterized by a moderate continental climate. The climate of the Project area, according to Köppen's classification of climate, belongs to Cfb climate, moderately warm and humid climate with warm summers. Scenarios for the future climate change for periods 2001-2030 and 2071-2100 predict an increase in air temperature of Banja Luka. At the same time, scenarios indicate reduction in amounts of precipitation. Changes in the rainfall regime will also be experienced during the seasons, frequency and intensity of extreme events (floods and droughts).

Air Quality and Air Emissions. For defining of the air quality of Banja Luka, data from the official measuring stations located in Banja Luka were used. During 2012 and 2014 the mean annual values for SO₂, NO₂, PM₁₀, PM_{2.5}, CO, and soot values did not exceed the limit or tolerant values nor the mean daily values according to the *Decree on Values of Air Quality*.

Noise. No data on ambient noise are available in BiH, since monitoring of noise is not carried out on a regular basis. Therefore, there are no baseline data to be presented for area of Banja Luka. The main noise sources in Banja Luka are road traffic, construction machinery, industry, machinery and vehicles for urban areas management, and sport activities, concerts, amusement parks, alarm systems, etc.⁵

Geomorphology and Geology. The new biomass heating plant is located on the left river terrace of River Vrbas, and no other relevant geomorphologic forms are identified in the closer area. With regard to geology, both the logistics centre and the new biomass heating plant are located on a lower terrace formed during the Holocene geologic period. Other geologic forms in the near area are marlstones, clays and sandstones with melanopsis, and also flysch, breccias lime stones, marlstones and calci – rudites in the wider urban area of Banja Luka.⁶ No active landslides have been identified.

Land Use. The land where the new biomass heating plant and the logistics centre will be located is categorised as urbanised land intended for construction, according to the Map for Urbanised Land and Constructed Units from the Spatial Plan of the City of Banja Luka. The location of the logistics centre is an industrial/commercial area. The location of the biomass heating plant is an area with complex cultivation patterns near the River Vrbas.

Soil. The land where the Project area is located belongs to the valley land types. The most important type of land in this group is fluvisol (hydromorphic type of soil).

Biological and Ecological Resources. There are no significant biological and ecological resources in the Project area since it is located in the urban part of Banja Luka near other industrial facilities, and involves semi-modified or modified habitats. At the location of the new biomass heating plant, several invasive species were identified during the field survey. The location of the logistics centre is a degraded area of semi modified/modified and artificial surfaces of the industrial part of Banja Luka, mostly covered with asphalt and unpaved roads and industrial plateaus.

⁵ City of Banja Luka, Energy Strategy of Republika Srpska until 2030, Banja Luka, 2012

⁶ Rehabilitation and Modernization of the District Heating System in the City of Banja Luka – Focus on Energy Efficiency, Rapid Assessment & Response Plan (May, 2016)

The Company will adopt and implement a sustainable biomass fuel procurement policy, and the biomass material is planned to be procured locally from the FSC-certified supplier to ensure that only biomass fuel of legal and sustainable origin is used. The biomass fuel supplied will contain a significant proportion of wood chips from sawmills and biomass waste materials from wood processing industry.

Protected Areas. No protected areas were identified within the Project area. The new biomass heating plant is located in the southern part of the urban area of the City, on the left bank of the river Vrbas. The protected area for resource management "Univerzitetski grad" is on its northern side. The approx. distance from the new biomass plant to the protected area is 600 m, whereas the logistics centre is at a distance of 1.3 km.

Landscape and Visual Values. The Project area is mainly lowland. It is located in the urban and constructed area of Banja Luka. The logistics centre is located within the "Incel Business Zone" of Banja Luka.

Public and/or Site Specific Transportation System. The transportation system in Banja Luka includes: (i) individual transport during everyday traffic (personal means of transport) and (ii) public transportation. There are no specific transportation lines that pass through the Project area.

Cultural Heritage, including Architectural and Archaeological Heritage. The Project area does not have any identified cultural and archaeological heritage sites in its close surroundings.

Socio-economic Status of the Population. Based on the preliminary results of the *Census of Population, Households and Dwellings in BiH 2013*, the City has 199,191 inhabitants, 65,225 homes and 87,986 apartments. The City has 53 settlements, with a total area of 1,239 km². Population density is 160.77 inhabitants per km². The largest share of population, households and dwellings is concentrated in the urban area of Banja Luka. Urban areas of Banja Luka are partly covered by the DH system.

According to the most recent data published by the RS Institute of Statistics⁷, the City has a total of 63,677 employed persons, and the unemployment rate is 17.8% (compared to the RS unemployment rate of 23.4%). The average monthly net salary in the City is BAM 964 (compared to the RS average of BAM 831).

According to the preliminary results of the 2013 Census, the size of the average household in the City is 3.05 household members. According to data from July 2017, the consumer basket⁸ for a family of four in RS amounts to BAM 1.852,02⁹, representing almost the double amount of average monthly net salary in the City.

According to estimates of the Institute of Statistics of RS¹⁰, 19.5% of the population in RS lives in relative poverty, and every sixth household are poor. The threshold of relative poverty is BAM 416.40 of monthly income. According to the methodology of the World Bank (WB), 15% of households in BiH live below the absolute poverty line¹¹.

4 PROCESS

As described in more detail above under "Project Permits", the Environmental Permit (EP) for the Project was issued by MSPCEE in July 26, 2017, in accordance with national legislation requirements.

Public participation was ensured as part of the environmental permitting procedure in line with the *Law on Environmental Protection*. The public was notified of the submitted application for the EP through an announcement in the local daily newspapers published on June 24, 2017. The relevant documentation was also submitted to the Department of Urban Planning of the City to allow for public access to hard copies of the documentation. The public disclosure period lasted for 30 days, and no comments were received from the public during this time.

The Project is compliant with the EU EIA Directive since it has obtained the necessary Environmental Permit. A screening procedure was undertaken as the first stage of the environmental permitting process, by the

⁷ Institute for Statistics, Statistical Yearbook of Republika Srpska 2016, 2016

⁸ A sample of consumer goods and services used to track prices

⁹ Source: Federation of Labour Union RS, http://savezsindikatars.org/sindikalna_potrosacka_korpa.php, accessed on 12 Sept 2017

¹⁰ Institute of Statistics of RS, Household Budget and Poverty Survey in RS in 2011, 3rd corrected release, 2013.

¹¹ Report on Progress of the Realization of Millennium Development Goals in BiH, UNDP, 2012

competent RS Ministry. Public disclosure and participation was ensured as part of the environmental permitting procedure in line with the RS legislation.

Environmental and social due diligence carried out by independent consultants has also concluded that the new biomass boilers will meet both national and EU requirements for air emissions, in line with MCP and IE Directives for the boilers.

5 SUMMARY OF PROJECT BENEFITS AND ADVERSE IMPACTS, AND MITIGATION MEASURES

5.1 Environmental and Social Benefits

The implementation of the Project will result in long-term environmental and social benefits positive impacts, including the following:

- **Reduction in air emissions and improved air quality:** using biomass (wood chips) instead of heavy fuel oil will result in reduction of concentrations of sulphur and nitrogen oxides in the air during the winter period in the city of Banja Luka, thus reducing the negative effects on human health and enhancing the quality of life of residents in the area of Banja Luka.
- **Climate change mitigation:** Replacement of HFO with biomass as a renewable energy source in the DH system will substantially reduce CO₂ emissions as the major greenhouse gas implicated in global warming, thus contributing to climate change mitigation, since burning biomass for energy adds no net CO₂ to the atmosphere over time.
- **Developed district heating system with improved existing infrastructure** with more efficient and economically sound heat supply: biomass will be locally supplied, thus decreasing dependence on import of sources of energy, avoiding price instability characteristic of imported HFO, enabling localization of fuel supply chain and strengthening the local economy associated with wood supply. This will also decrease the costs of purchase of fuel and thus the costs of system maintenance. Reliability and security in heat energy supply to citizens of Banja Luka will be increased. The Project will enable the provision of 24-h heating services during the winter season (compared to the existing 16-17 h period). The currently planned Project activities represent a sound basis for further long-term improvement of the network and installation of calorimeters.

5.2 Environmental and Social Adverse Impacts and Mitigation Measures During Construction

5.2.1 Air quality

Description of impact	Planned mitigation measures
<p>Impacts on air quality during construction may be caused by:</p> <ul style="list-style-type: none"> ▪ exhaust gases from truck and machinery used for construction ▪ particulate matter (dust) from the construction site as well as roads during passing of trucks and mechanization <p>Since the planned construction works are small-scale and temporary, negative impacts on air quality are assessed as minor.</p>	<ul style="list-style-type: none"> ▪ Apply all necessary measures to minimize dispersion of particulate matter in the air ▪ Prevent uncontrolled spreading and scattering of waste ▪ Perform regular technical inspection of vehicles and equipment, use unleaded fuel and fuel with low sulphur content ▪ Keep work areas orderly, in particular during summer ▪ In the summer months, wet roads and work areas with water

5.2.2 Water and land quality

Description of impact	Planned mitigation measures
<p>The planned location of the new biomass plant is in the immediate vicinity of the River Vrbas (approx. 60 m). During construction, the following direct and indirect impacts on surface and groundwater may be expected:</p> <ul style="list-style-type: none"> ▪ Inadequate management of discharge and disposal of sanitary (faecal) water from the construction site may endanger the quality of groundwater and the health of people who may 	<ul style="list-style-type: none"> ▪ Adhere to spatial planning measures defined in the Urban Planning Consent ▪ Prior to start of construction, develop a Construction Site Organisation Plan with a defined space for disposal of removed cover land, construction waste storage, municipal waste storage, etc. ▪ Establish a system of adequate wastewater management by

<p>come into contact with such water. However, adequate construction site organization and compliance with basic sanitary and technical conditions will ensure that these impacts are avoided</p> <ul style="list-style-type: none"> ▪ Potential risk of accidental spilling of oil and oil derivatives, motor oil and similar waste ▪ Uncontrolled disposal of excavated material ▪ Inadequate disposal of unused materials and their packaging. <p>The listed negative impacts are expected to be temporary and without significant disturbances to the quality of the River Vrbas or groundwater if the construction works are undertaken in line with good construction practices.</p> <p>Potential impacts on land quality during construction include the following:</p> <ul style="list-style-type: none"> ▪ The key impact is the permanent loss of land due to building of facilities and work areas ▪ The surface of the land will be excavated for the purpose of building the facilities – a part of excavated material will be used for landscaping, and the remaining will be handed over to the authorized waste collector ▪ During earth works, prior to backfilling, uncontrolled pollution of land and indirectly surface and groundwater is possible ▪ During backfilling, it is possible that contaminated land and waste construction material may be backfilled ▪ Improper collection and storage of waste packaging may lead to scattering of waste due to wind, and a fire in case of neglect ▪ The impact of dust on land due to subsidence in the immediate vicinity of the construction site is negligible (due to small amounts of dust and the temporary nature of work). The total dust that will occur will not impact land quality. <p>These impacts are very localized (up to 200 m from the project location), of moderate intensity, temporary, and may be avoided through adequate organization and supervision of the construction site.</p>	<p>constructing work areas in a manner ensuring the drainage of surface water and in line with the predicted frequency and load of transport vehicles moving at the site</p> <ul style="list-style-type: none"> ▪ Install, regularly maintain and empty mobile toilets at the site ▪ Carry out all work with oil and its derivatives with max. protection measures ▪ Prohibit washing of machines and vehicles in the work area; minimize the possibility of accidental water pollution due to personnel negligence through good organisation and supervision ▪ Keep all vehicles and machinery that use liquefied fuel on a watertight slab, with strict control of possible contamination (leakage). Keep liquid fuels in closed containers in a safe place, preferably in a concrete basin. In case of a spillage, immediately start remediation of the contaminated surface. Avoid night work for operation of machinery, and continuously check that machinery is in good working order ▪ Keep adsorption agents in order to prevent the penetration of hazardous substances (e.g. engine oil or oil from hydraulics of machinery) into land and groundwater in the event of uncontrolled spillage of such substances ▪ The watertight slab for placement of machinery to also include a system for collecting water from the slab (equipped with a separator of oil and suspended particles), on which all the collected water from this slab would be purified prior to discharge into the recipient ▪ Prohibit the disposal of excavated material on the river bank and into the watercourse ▪ Prior to start of construction, plan the location of construction material disposal on sites where there is the least risk for the vegetation cover ▪ Dispose of all excavated humus on separate sites isolated from the impacts of other excavated materials and polluted by chemicals. Keep removed humus for subsequent landscaping needs of the site to reduce degradation of soil ▪ Properly dispose of municipal waste until it is handed to competent utility authorities ▪ Use only machinery and transportation means in proper technical condition
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5.2.3 External noise and vibrations

Description of impact	Planned mitigation measures
<p>Noise will be generated by construction activities including preparatory, construction and earth works, as well as by means of transportation and construction machinery such as excavators, loaders, etc. Vibrations will be caused by means of transportation (trucks) and machinery (loader, bulldozer, trencher). Occasional increase in vibrations will occur during the work of machinery at the construction site, i.e. during loading and removal/transport of materials.</p> <p>Taking into account the type of the heating plant and the fact that these impacts will be temporary and localised, this impact is assessed as a minor impact.</p>	<ul style="list-style-type: none"> ▪ Perform construction works at specified time intervals and in accordance with the <i>Rulebook on Permissible Limits of Noise and Noise Intensity</i> ▪ Prohibit use of construction machinery during night-time; perform such works during work hours and work days ▪ Ensure that workers use noise protection equipment ▪ In case the noise levels exceed the permitted values, prohibit the use of machinery generating unacceptable levels of noise ▪ Ensure that the equipment manufacturer submits all the relevant documentation on applied construction solutions and protective equipment against noise and vibrations, in line with the <i>RS Law on Protection at Work</i> ▪ Measured noise level values at similar construction sites are within the limits of 80-85 dB, which clearly indicates the need for adequate protection. Ensure suitable protection devices for operators of machinery: ear wadding for noise up to 75 dB, ear plugs for noise up to 85 dB, ear protectors for noise up to 105 dB

5.2.4 Waste generation

Description of impact	Planned mitigation measures
<p>No adverse impacts are expected.</p> <p>Management and disposal of construction waste is covered with</p>	<ul style="list-style-type: none"> ▪ Include in the technical documentation of the Main Design (i.e., the Waste Management Plan): the disposal method for construction and other waste, the quantities of materials to

<p>measures specified in Waste Management Plan, which is part of environmental documentation.</p>	<p>be removed during the construction works and the disposal plan for such materials</p> <ul style="list-style-type: none"> ▪ Conclude all waste disposal contracts in line with the <i>Regulation on Transfer of Waste Management Responsibilities from Manufacturers and Sellers to the Responsible Person of the Waste Collection System</i> ▪ Set up temporary waste disposal sites (waterproof surface protected from atmospheric impacts) or use waste disposal containers until the collection of waste by authorized institutions ▪ Collect metal waste that will be generated during construction in a single place set up for these purposes, and sell such waste as secondary raw material to authorized companies ▪ Prohibit incineration of collected waste at construction site
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5.2.5 Flora and fauna

Description of impact	Planned mitigation measures
<p>To prepare the site, the plant covering layer needs to be removed, which will result in the removal of indigenous plants. The following negative effects on flora and fauna may be expected:</p> <ul style="list-style-type: none"> ▪ Degradation and habitat reduction, since the flora will be directly affected due to removal of autochthonous vegetation ▪ Direct impacts on small animal species are possible during preparatory works at the project location and construction works including earth, concrete, reinforcement and assembly works. These impacts are temporary, short-term and localised ▪ In the course of construction machinery, short-term impacts of dust and noise on the flora and fauna of the surrounding area are expected due to work of operations of construction machinery <p>After the preparation of the terrain and removal of existing plant species, the remaining areas will be re-cultivated with autochthonous plant species according to the landscaping design.</p> <p>After construction works, autochthonous plant species will be planted in the green areas, whereby the natural landscape characteristics of the surrounding area and the existing vegetation will be retained as much as possible, which will ensure the preservation of the habitats.</p> <p>In conclusion, the impacts on flora and fauna will occur only during the construction of the heating plant and are expected to be of low intensity. Keeping in mind that there are no protected plant species in the area, and that the impacts will be restricted to a relatively small area from, the disappearance of any plant species is not expected. Protected area Univerzitetski grad is approx. 600 m distant from the Project area. The site is protected for its role in genetic diversity preservation since it is a botanical garden with autochthonous species. It is protected as category "Protected area for resource management".</p>	<ul style="list-style-type: none"> ▪ In order to protect the vegetation and avoid unnecessary destruction of vegetation, limit the cutting of vegetation and movement of construction machinery and vehicles exclusively to the area approved in the Main Design ▪ In order to protect the surrounding fauna and minimize disturbances, use construction machinery in good technical order and with the lowest level of emissions of harmful products of combustion, noise and vibration ▪ Minimise impacts on surrounding flora and fauna through construction site organisation and constructing in phases

5.2.6 Visual and landscape values

Description of impact	Planned mitigation measures
<p>The construction of the new biomass heating plant will change the current appearance of the location to some extent, even though the plant has been designed in accordance with the urban planning characteristics of the site, and in accordance with the architectural and ambient appearance of the urban parts of the city.</p>	<ul style="list-style-type: none"> ▪ Perform works solely in the spatial scope determined for the project ▪ Restrict cutting and removal of vegetation solely to necessary areas ▪ Prohibit any other works except the works determined for the project ▪ Prohibit works that would disturb or change the course of watercourses, or works on regulation of the river bed without prior consent of the competent institutions ▪ Strictly prohibit disposal of any type of waste at the site without the necessary approvals

	<ul style="list-style-type: none"> ▪ All installations on the site (electricity, etc.) must be cabled ▪ Thermal facilities should have min. dimensions allowing for the planned processes ▪ After the completion of construction works, undertake measures of recultivation and rehabilitation of the terrain
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5.2.7 Community health and safety

Description of impact	Planned mitigation measures
<p>Negative short-term impacts during the construction phase may be expected in terms of:</p> <ul style="list-style-type: none"> ▪ increased noise levels due to operation of construction machinery and devices ▪ traffic congestions due to increased frequency of transport for purpose of delivery of construction materials ▪ increase in dust during the dry season. <p>Since these impacts on the surrounding communities are temporary and localized (up to 200-500 m from the project site), the impacts have been assessed as minor.</p>	<ul style="list-style-type: none"> ▪ Present the negative and positive effects of project implementation to the local population and the public. Take into respectful consideration the concerns and conflicts of interest related to landscape, environmental, property and other aspects. ▪ Prohibit use of construction machinery during night-time; perform such works during work hours and work days ▪ Set appropriate warning signs both on the site and in its surroundings ▪ Due to the expected traffic increase through the settlement of Borik (in particular, trucks), and with the aim of protecting children and other people, organise the passing of trucks and movement of construction machinery in hours other than rush hours and set speed limits

5.2.8 Workers' health and safety

Description of impact	Planned mitigation measures
<p>Impacts on workers' health and safety have been assessed within the developed Occupational Health and Safety Plan for the construction phase, which defines in detail:</p> <ul style="list-style-type: none"> ▪ hazardous zones within the construction site (such as under the crane or scaffold, entrance to the building, trenches, etc.), ▪ jobs considered to be hazardous (such as carpenter, tinsmith, etc.), ▪ hazardous substances at the construction site including types of harmful gases, dust and vapour. 	<ul style="list-style-type: none"> ▪ Install warning signs, fences, sound signals for hazardous zones, and install visible instructions for safe work and handling of work equipment ▪ Train all construction workers on hazardous zones and safety measures; make a list of all persons trained ▪ Use PPE as defined ▪ Use fire protection measures at all places where a fire may occur as defined ▪ Apply protection measures against electrical hazards, hazardous substances, work at heights, etc., as defined ▪ Organise first aid at the construction site as defined

5.2.9 Cultural heritage

Description of impact	Planned mitigation measures
<p>No impacts on natural and cultural heritage are expected.</p>	<ul style="list-style-type: none"> ▪ In case the contractor encounters archaeological sites or objects during construction and other works, it is required to suspend all works immediately and undertake measures to safeguard the finding in its original place ▪ In case the contractor encounters a natural object of geological-palaeontological or mineralogical-petrographic origin, which is presumed to be a nature monument, it is necessary to inform the RS Institute for Protection of Cultural and Historical Heritage and take all measures to prevent damage to the finding until the arrival of an authorised person

5.2.10 Accidental situations

Description of impact	Planned mitigation measures
<p>Activities during construction may cause accidental situations, such as: accidental leakage of oil, pollution of surrounding environment, workers injury etc. However, the Contractor for construction works was required to develop a Construction Site Organization Plan (CSOP)¹² prior to construction works, so that all potential accidental situations are reduced/eliminated.</p>	<ul style="list-style-type: none"> ▪ All facilities must be designed according to the globally accepted criteria for hydraulic, static and structural stability ▪ The investor must comply with all measures prescribed in the analysis related to occupational safety and fire protection in accordance with the Occupational and Health Plan and the Fire Protection Plan, which form an integral part of the project documentation

¹² Required by the *Law on Spatial Planning and Construction*

<p>The CSOP defines: the organisation of preliminary works, organisation scheme, organisation of sites during construction in accordance with the organisation scheme, and organisation of sites after construction. It also includes required measures in accordance with the <i>Law on Safety at Work</i> and the <i>Law on Fire Protection</i> (e.g. defines mandatory equipment for OHS, preliminary medical assistance and plan for alerting the official medical assistance authorities, preliminary fire-fighting activities in case of fires and plan for alerting fire-fighting services).</p> <p>According to the <i>Law on Waste Management</i>, special emphasis is given on proper management of hazardous construction waste.</p>	
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5.3 Environmental and Social Adverse Impacts and Mitigation Measures During Operation

5.3.1 Air quality

Description of impact	Planned mitigation measures
<p>The operation of the new biomass heating plant is expected to generate emissions of waste flue gases from the steam boilers in which the biomass is burned through the chimneys. However, considering that the installation of a system for dedusting of boilers and the installation of high-performance dry baghouse filters with propulsion/exhaust fans for each boiler is planned, it is considered that air quality will not be affected.</p> <p>The main characteristic of biomass is that it contains very small amounts of sulphur and nitrogen, so the formation of sulphur compounds during combustion (SO₂) is not expected. Nitrogen oxides (NO_x) generated by the combustion of nitrogen from wood chips are negligible (compared to the amount of nitrogen in the air), whereas low levels of nitrogen oxide emissions can potentially occur, solely by oxidation of nitrogen from the air.</p> <p>Sawmilling of wood logs will cause dusting of the area in the logistics centre.</p>	<ul style="list-style-type: none"> ▪ Provide an adequate dedusting system - high-performance baghouse filters that should be based on the principle of "dry operation" without using water to dedust ▪ Install high-performance baghouse filters with propulsion/exhaust fans for each boiler ▪ Baghouse filter must satisfy the requirements for limit values of emission of floating particles of <20 mg/m³, and the material structure of the filter should not allow the passage of particles while ensuring air passage ▪ Ensure filter cleaning and baghouse regeneration through baghouse shaking by means of a centrifugal fan, to avoid the need to procure and install compressor stations and compressed air distribution ▪ Filter bags should be waterproof ▪ Ensure addition of secondary air in large impulses for purpose of intensive mixing of flue gases and air, and thus complete combustion ▪ Design and build a measuring point on the chimney to monitor gases discharged into the air ▪ Develop a program for emission monitoring that will include: selection of measurement method and measuring equipment, characteristics of measuring equipment in relation to the parameters of flue gases and expected concentration of pollutants, method of equipment maintenance and ensuring confidence in measured values, monitoring period within a year, and processing of measurement results and comparison with emission limit values ▪ Regularly submit results of emission monitoring to the competent department in the City administration, as well as to the RS Ministry of Physical Planning, Civil Engineering and Ecology once a year ▪ Keep records of measurements for at least 5 years ▪ Cleaning efficiency of filter plant must be at a max. level ▪ Concentrations of waste pollutants in flue gas released into the air must be below the limit values prescribed by the <i>Regulation on Measures to Prevent and Reduce Air Pollution and Improve Air Quality</i> ▪ Regularly clean the chimney in order to ensure its functionality ▪ Check that the multi-cyclone and filter are in good working order and functional in order to ensure their efficient operation ▪ Perform regular technical checks of exhaust gases of working and transport machinery, their regular maintenance, and the use of low sulphur-containing fuels ▪ Install the chimney at a min. height of 30 meters ▪ Maintain storage and work areas in front of the warehouse in order to avoid dispersion of dust from these areas

	<ul style="list-style-type: none"> ▪ Avoid dispersion of dust particles in the air during the unloading of wood chips ▪ Organise all transport (that is not key to the technological processes) at times other than the rush hours (06.00-09.00 and 15.00-18.00 h) to reduce traffic congestions ▪ Perform transport within the plant premises and the delivery of wood chips only using regularly serviced means of transportation that are in good working conditions and comply with the permissible emissions and noise levels
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5.3.2 Water and land quality

Description of impact	Planned mitigation measures
<p>Impacts on water quality during operation are assessed as minor, due to the following:</p> <ul style="list-style-type: none"> ▪ Sanitary wastewater will be generated and discharged into the public sewage system ▪ Stormwater from roads, storage and work areas will be collected through a separate system and discharged into the public sewage system ▪ Process water will be recirculated, i.e. will not be discharged into the recipient, sewage and further into the Vrbas River, except in cases of overhauls or a disaster ▪ Wastewater from cleaning of boiler plants will be discharged into the public sewage system ▪ The quality of all wastewater will need to comply with the allowed limit values defined by the <i>RS Regulation on Conditions for Discharge of Wastewater into Public Sewage</i> <p>During the regular operation of the biomass plant, no direct impacts on land are expected taking into consideration the type of the plant and the work processes, due to the following:</p> <ul style="list-style-type: none"> ▪ Basic type of waste resulting from the combustion of wood chips will be ash and floating ash which will be separated on filters during the treatment of flue gases (baghouse filters) ▪ Removal and transportation of ash is planned by means of transporters to the ash container and further disposal to the landfill for final disposal ▪ Packaging waste (paper and plastic bags, PET and glass bottles, etc.) and other types of usable waste will be recycled and therefore selectively collected for delivery to authorized operators ▪ Metal waste from replacement of worn-out or damaged parts will be delivered to authorized operators ▪ Mixed municipal waste will be collected in special containers and transported to the municipal landfill for final disposal <p>Indirect impacts may potentially be caused by inadequate waste management and disposal.</p>	<p>Measures for both water and land quality impacts:</p> <ul style="list-style-type: none"> ▪ Build a separate sewage system with wastewater quantity calculation and connect it to the public sewage system ▪ Ensure water supply for sanitary and fire protection needs from the city water supply network, under the conditions prescribed by the competent utility company ▪ Keep the water meter on the connection to the city water supply network in proper condition, as defined in Article 54 of the Law on Water ▪ Drain rainwater from the facility roof to the surrounding land ▪ Strictly prohibit the disposal and storage of any type of waste material at the site in order to prevent microbiological contamination of groundwater ▪ Prohibit discharge of wastewater (regardless of origin) to the end recipient without proper pre-treatment in accordance with the Decree on Classification of Water and Categorization of Watercourses ▪ Pre-treat wastewater from the cleaning of boiler plants in the precipitator in order to reduce the pollution load in the effluent in line with the values permitted by the <i>Regulation on Conditions for Discharge of Wastewater into Public Sewage</i> ▪ Treat contaminated rainwater from internal roads, handling areas and work surfaces in the precipitator and grease and oil separator to achieve the prescribed quality prior to discharge into the sewage system ▪ In case of uncontrolled release of hazardous substances, ensure sufficient amounts of adsorbents and adequate receptacles for fuel, and engage an authorized institution for removal of hazardous substances and rehabilitation of the site in accordance with the <i>Law on Waste Management</i>

5.3.3 Noise and vibrations

Description of impact	Planned mitigation measures
<p>Considering the characteristics of the production process, it is considered that the noise levels will not exceed the permitted levels prescribed by RS legislation. It is expected that the highest noise intensity will occur within the project location. In order to reduce noise intensity, the facilities within which noise will be generated are planned to be constructed with dimensions of approx. 85.05 m x 31.20 m, with a reinforced concrete prefabricated structure with pillars placed on a 12 m grid and a corresponding reinforced concrete prefabricated roof structure, and the finishing of the walls with aluminium sandwich panels on a steel substructure. The roof will be covered with the same panels with fillings that meet the requirements of noise protection or soundproofing.</p> <p>During the operation of the plant, no vibrations with an impact on the environment are expected.</p>	<ul style="list-style-type: none"> ▪ Place all technological units with increased noise emissions in closed facilities, if technically feasible ▪ Use modern working machines and transportation means that generate noise of lower intensity ▪ Ensure regular maintenance of the process equipment, regular lubrication of rotating mechanisms, etc. in order to prevent the vibration of sheets, surface friction and noise generation ▪ Ensure that generated noise during operation does not exceed the maximum allowable noise level of 60 dBA

5.3.4 Waste generation

Description of impact	Planned mitigation measures
<p>The waste generated during the operation phase will include ash, collected dust in the filter plant, and increased generation of municipal waste.</p> <p>All waste will be collected in separate containers and delivered to authorized operators for individual types of waste.</p>	<ul style="list-style-type: none"> ▪ Develop a Waste Management Plan in line with the <i>Law on Waste Management</i> and appoint a responsible person for waste management ▪ Organise space for containers for disposal of solid waste (compact, easy-to-clean surface, built system for collecting washing water, connection to the system for collecting rainwater, creating a protective green barrier around the space) ▪ Regularly control the closed system for transporting ash from the boiler fire pit to the enclosed container. Regularly visually control whether the container is full. Use ash from the boiler as a secondary raw material; if not possible, collect it separately and hand it over to the authorized institution for final disposal ▪ Collect floating ash (from the filter system) and hand it over to the authorized institution for final disposal ▪ Provide adequate treatment of waste sludge from the cleaning of accumulated sediment in the sludge pit chambers, by engaging an authorized institution to transport it to a controlled landfill for final disposal ▪ Regularly empty and clean the oil and grease separator, and engage an authorized institution to perform this ▪ During summer, perform regular overhaul of the plant in order to ensure good working order. Pay particular attention to the boilers and the accumulation of water sediment and soot ▪ Collect metal waste generated during replacement of worn or damaged parts at the source, and hand it over to an authorized operator for trade with secondary raw materials ▪ Separately collect waste paper, waste PVC material, glass and other usable waste in appropriate containers and hand it over to an authorized operator for processing and trade with secondary raw materials ▪ Separately collect batteries, electronic and electronic waste in dedicated containers and store them in a controlled warehouse until they are handed over to an enterprise licensed for management of such waste ▪ Conclude contracts for disposal of all types of waste in accordance with the <i>Regulation on Conditions for Transfer of Waste Management Obligations from the Manufacturer and Seller to the Responsible Person of the Waste Collection System</i>

5.3.5 Community and workers' health and safety

Description of impact	Planned mitigation measures
<p>During operation, no impacts on community health and safety are expected in terms of noise, air quality etc., as all emissions from the new biomass heating plant are planned below the limit values defined by law. However, the operation of the new plant will inevitably increase traffic volume, due to the passing of 15-20 heavy trucks carrying biomass on a daily basis from the logistical centre to the biomass heating plant.</p> <p>No major risks for workers' health and safety during operation of the new plant are expected, as the operation process will be entirely automated and provided that all mitigation measures are properly implemented.</p>	<ul style="list-style-type: none"> ▪ Provide hygienic and technical measures for protection of workers, PPE, and other measures for personal and collective protection of workers ▪ Ensure personal and collective protection of workers and legally mandatory health care in competent healthcare institutions ▪ Fulfil legal requirements on reporting to the RS Ministry of Health and Social Protection if any negative impacts on human health and the environment occur ▪ Implement preventive OHS and fire protection measures ▪ Provide training for employees and appoint a responsible person for environmental protection ▪ During operation, inform local communities about the expected increase in traffic volume due to the passing of 15-20 heavy trucks carrying biomass on a daily basis from the logistics centre to the biomass heating plant, and the planned routes of the trucks

5.3.6 Flora and fauna

Description of impact	Planned mitigation measures
<p>Emissions that will occur during the operation phase (emissions of waste gases, noise) will have minor impacts on the flora and fauna in the vicinity of the site.</p> <p>The areas surrounding the site have already been built and there already exist anthropogenic influences. There are no recorded habitats of rare and valuable species of flora and fauna in the surrounding area.</p>	<ul style="list-style-type: none"> ▪ Prevent any pollution of soil, ground and surface waters which may have negative impacts on flora and fauna of the surrounding area ▪ Implement all measures for protection of air, surface and groundwater, soil and waste management to provide conditions for protection of flora and fauna

5.3.7 Landscape and visual values

Description of impact	Planned mitigation measures
<p>No impacts are expected during the operation phase.</p>	<ul style="list-style-type: none"> ▪ Following the completion of construction of all facilities, undertake landscaping of the free space at the site in accordance with the landscape design ▪ Undertake landscaping using autochthonous vegetation ▪ Regularly maintain green areas at the site ▪ Adequately manage all generated waste

5.3.8 Accidental situations

Description of impact	Planned mitigation measures
<p>The following accidental situations could potentially occur during the operation phase:</p> <ul style="list-style-type: none"> ▪ emission of large quantities of dust due to a malfunction in the filter plant for treatment of flue gases, which would endanger the quality of air and the health of the surrounding communities ▪ inadequate treatment of waste could potentially result in an incident that would endanger the quality of land, groundwater, surface water, and thus the health of the surrounding communities ▪ a fire in the heating plant and its facilities would lead to harmful emissions into the air and endanger the health of the population <p>The possibility of flooding of the Project site has been analysed since the site is located along the Vrbas River. Based on the review of the document "Hydrological and morphological analysis of the Vrbas watercourse in Banja Luka" and an analysis of the position of the planned location in relation to the elevation of large waters, with probability of occurrence once in a 100 years and once in 500 years, it has been assessed that the site is located outside the reach of such large waters.</p>	<ul style="list-style-type: none"> ▪ Permanently monitor the operation of the filter plant by monitoring all technological parameters through the associated processor unit ▪ Prescribe adequate measures to maintain and manage the operation of the filter system to ensure environmental protection against all possible impacts ▪ Regularly monitor the concentration of dust by continuous measurement after filtering through an automatic device. In case of any increases in the concentration, immediately take all corrective technical and technological measures to reduce dust emissions in line with permissible levels ▪ In case of any proven inefficiencies in the operation of the plant and equipment, plan additional protection measures ▪ Comply with all measures prescribed in the OHS Plan and Fire Protection Plan which form an integral part of project documentation

5.3.9 Maintenance of equipment and installations

Description of impact	Planned mitigation measures
<p>No specific impacts expected during the operation phase.</p>	<ul style="list-style-type: none"> ▪ Periodically inspect the standard mechanical and electrical installations which must be approved and tested by an authorized institution ▪ Regularly clean handling areas with water ▪ Allow only authorized and trained personnel to handle installations ▪ Place operating instructions, warnings and prohibitions in appropriate places ▪ To prevent possible accidents and to regulate the behavior of employees in cases of damage to installations and accompanying equipment and assets, comply with all protection measures and the procedures defined in the operating and maintenance instructions issued by the equipment and tools manufacturer, the internal instructions of the user, as well as the OHS and fire protection measures defined by legislation and internal rules

6 MONITORING

Environmental and social monitoring will be implemented both during construction and operation of the project. The parameters to be monitored are shown in the table below.

Table 1: Monitoring Measures

Parameter to be monitored	Purpose of monitoring	Where will monitoring be performed?	How will monitoring be performed?	When will monitoring be performed?
Existence of environmental permits for quarry, asphalt and concrete facilities from which materials are obtained	Ensuring that the DH plant complies with the environmental, health and safety requirements	Legal entities from which materials are obtained	Review of documentation	During the procurement of materials
Covering of trucks during transportation of powdered materials	Ensuring that there are no emissions of dust into the air and scattering of materials into the environment	At the construction site and transport routes	Visual supervision	During the transportation of materials
Degradation and pollution of land	Determining whether there has been a leak of liquid petroleum products, erosion of soil and landslides caused by construction works	At the construction site and its immediate vicinity	Visual supervision	Weekly
Does the construction site meet the conditions and guidelines for good construction practices?	Ensuring environmental protection and preventing the occurrence of incidental situations on the construction site	At the construction site	Visual supervision, review of documentation	During the execution of works
Appearance of noise and air pollution	Determining the levels of air pollution and noise, and comparison with the legal limit values Applying additional mitigation measures in case of deviations	At the construction site	Standard equipment for measuring air quality and noise levels	At the order of the environmental inspector
Control of working hours	Determining compliance with working hours and restricting noise emissions to day-time working hours	At the construction site	Visual supervision and comparison with the Construction Site Organisation Plan	Upon receipt of citizens' complaints
Waste management during the execution of works	Checking whether containers for collection of municipal waste have been installed, whether hazardous waste is disposed of in an adequate manner, preventing uncontrolled disposal of waste	At the construction site	Visual supervision and comparison with the Waste Management Plan.	Continuously
Number of recorded accidents, existence of hygienic conditions for workers, and use of PPE	Determining the implementation of OHS protection measures	At the construction site	Visual supervision, review of documentation	Continuously during the execution of works
Quality of works performed, and quality of materials	Preventing weak control and assessment of the quality of performed works which may cause damage to the environment, poor quality construction and use of low quality materials, thus leading to potential damage to the structures and exposing the local population to risks and possible accidents	At the construction site	Visual supervision and review of records	Continuously during the execution of works and after removal of construction sites
Waste remains and soil degradation	Determining whether all waste from the construction site has been removed and whether remediation has been carried out	At the Project site	Visual supervision	After the completion of construction works
CO, SO ₂ , NO _x , solid particles, blackness of flue gas	Measuring emissions of flue gases from the chimneys to determine the impact of the plant's operation on air quality	On the chimney of the heating plant	Once a year during operation (heating season) and at the order of environmental inspectors	

Parameter to be monitored	Purpose of monitoring	Where will monitoring be performed?	How will monitoring be performed?	When will monitoring be performed?
Physical and chemical parameters (basic indicators of the quality of wastewater – effluent)	Determining the quality of wastewater before its discharge into the public sewage system - identifying the impact of the effluent on the public sewage system; reduction of the required degree of purification %	At the location of the plant (at the outlet into the public sewage system)	Once a year after the annual overhaul of boilers, one sample of wastewater.	
Total noise levels at the site	Measuring noise levels to estimate the impact of the plant's operations on the total noise level at the site	At the border of the location with the nearest residential buildings	Once a year during operation (heating season) and at the order of environmental inspectors	

In addition, the Project Team will submit Annual Environmental and Social Reports to EBRD summarising environmental and social impacts, health and safety performance, disclosure and consultation performance and implementation of the external grievance mechanism. The Project Team will also be responsible for monitoring of all Project related stakeholder engagement activities, ensuring the fulfilment and updating of the SEP, and reporting to EBRD.

7 COMMUNICATIONS

The Company intends to disclose the following documentation and information regarding the Project:

- This Non-technical Summary;
- The Stakeholder Engagement Plan;
- Project Grievance Form and Public Grievance Leaflet (see Stakeholder Engagement Plan);
- Information on the risks and disturbances associated with construction and operation, and updates regarding the implementation progress of the Project; in particular information on the expected increase in traffic volume due to the passing of 15-20 heavy trucks carrying biomass on a daily basis from the logistics centre to the biomass heating plant, and the planned routes of the trucks;

The documents and information will be available in local language (as well as English where available) immediately upon their availability, on the website of the City of Banja Luka (www.banjaluka.rs.ba). The documents will also be made available in printed copies in the premises of the City and the Company at the following address

City of Banja Luka

Address: Trg srpskih vladara 1, Banja Luka

“EKO TOPLANE BANJALUKA” D.O.O.

Address: Petra Kočića no. 113a, Banja Luka

The Company will schedule and hold at least one public consultation meeting during Project preparation (but prior to putting the biomass heating plant into operation). All available Project information and documents will be disclosed to the public at least 7 days in advance of the meetings. If necessary, separate meetings will be held to ensure that the stakeholder engagement is gender responsive.

The meetings will be aimed at providing information to the public about the operations of the new plant, in particular information on the expected increase in traffic volume due to the passing of 15-20 heavy trucks carrying biomass on a daily basis from the logistics centre to the biomass heating plant, and the planned routes of the trucks. Participants will be able to present their opinions and remarks with regard to the Project, as well as suggest possible solutions of the issues raised.

The conclusions of the meeting will be agreed during the meeting and recorded. All justified comments and proposals will be considered and appropriately addressed. The Project Team will publish a summary report of all relevant issues raised, including explanations for inclusion or exclusion of proposals.

The timetable and the venue designated for the meeting will be precisely defined by the Company, and all stakeholders will be informed about the exact date, time and venue where the meeting will be held, at least 7 days in advance, through disclosure through the website of IEE and the City of Banja Luka, as well as local media (newspapers, online news portals).

In addition, individual consultation meetings for specific issues may be organized at the initiative of the Company, the City of Banja Luka or by any identified stakeholder groups/individuals.

Contact information for enquiries and grievances:

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