

# NON-TECHNICAL SUMMARY

## Construction of Regional Waste Management Centre “Kalenic”

Serbia

August 2021



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## Abbreviation List

Abbreviation	Full name
AFD	Agence Française de Développement
CESMP	Construction Environmental and Social Management Plan
CLO	Compost Like Output
E&S	Environmental and Social
EBRD	European Bank for Reconstruction and Development
EIA	Environmental Impact Assessment
ESAP	Environmental Social Action Plan
EU	European Union
H&S	Health & Safety
HR	Human Resources
MBT	Mechanical Biological Treatment
MoEP	Ministry of Environmental Protection
MoF	Ministry of Finance
MRF	Material Recovery Facility
NTS	Non-Technical Summary
NWMS	National Waste Management Strategy
OESMP	Operation Environmental and Social Management Plan
PAPs	Project Affected Persons
PIU	Project Implementation Unit
PUC	Public Utility Company
RDF	Recovery of Waste Derived Fuel
RWMC	Regional Waste Management Center
RWMS	Regional Waste Management System
SEP	Stakeholder Engagement Plan
SRF	Solid recovery Fuel
WtE	Waste to Energy

# 1 Introduction

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The European Bank for Reconstruction and Development (EBRD) and the French Development Agency (AFD) are each considering providing a sovereign loan to the Republic of Serbia to finance critical improvements in the solid waste management system across several secondary cities in the country.

The program aims to support the development of an integrated and modern solid waste management system in Serbia, via:

- The establishment of Regional Waste Management Systems (RWMS) articulated around a Regional Waste Management Centre (RWMC) covering several municipalities (particularly for the sanitary landfill), a solution identified as the most economically viable in the National Waste Management Strategy (NWMS);
- The establishment of primary sorting / recycling systems; and
- Treatment and recovery of biodegradable waste,
- Infrastructure necessary for collection (waste bins, containers, vehicles and transfer stations).

The borrower for the Programme will be the Republic of Serbia (RS), represented by its Ministry of Finance (MoF) as a signatory to the AFD and EBRD's Loan agreements. The MoF will then allocate the funding to the Ministry of Environmental Protection who will establish the Project Implementation Unit (PIU) and be the project owner of the Programme.

The Project aims at provision of modern solid waste infrastructure compliant with EU standards, contribute to higher service levels, and address pressing environmental challenges in the solid waste sector in line with the National Waste Management Strategy.

## Company Eko-Tamnava d.o.o. Ub

Eko-Tamnava d.o.o. Ub was founded in 2012, with main function to organize and coordinate the delivery of regional waste management services which were founded by 11 municipalities (Valjevo, Obrenovac, Lazarevac, Ub, Barajevo, Vladimirci, Lajkovac, Mionica, Koceljeva, Osecina, Ljig). All 11 municipalities have committed themselves through the inter-municipal agreement to dispose their waste at the

proposed RWMC, once it is operational. Joining of four new municipalities to the Kolubara region (Loznica, Mali Zvornik, Krupanj, Ljubovija) will be regulated through commercial contracts with Eko Tamnava d.o.o Company. Collection of waste at the local level will remain the responsibility of individual municipalities and local Public Utility Companies (PUCs).

During the project's operational phase, the general function of "Eko-Tamnava" d.o.o Ub will be to organise and coordinate the delivery of regionalised waste management services, on behalf of its members and other municipalities within the region, on a commercial basis.

## Current waste collection practices in the Region

In all municipalities PUCs are responsible for collection, transport and disposal of waste. Waste collection is generally limited to urban centres and percentage of coverage by waste collection in most municipalities corresponds to the percentage of people who live in urban areas. Recycling procedures and other treatment options are not fully utilized, so a large amount of valuable secondary raw materials ends up in landfills. Common difficulties that all municipalities are facing in day-to-day operations include outdated or insufficient mechanisation or lack of waste containers.

Educations of the residents in the region on the importance and manner of the adequate separation and collection of waste are needed. Those are required for the population to developed awareness and knowledge of sustainable waste management, respect for the hierarchy of waste management and implementation of environmental protection measures.

Non-regulated landfills have already been closed in municipalities Barajevo and Ljig, part of the landfill in the City of Loznica, as well as 2 out of 5 non-sanitary landfills in Municipality Ljubovija. Non-regulated landfills are still operating in the remaining 9 cities and municipalities, in addition to the remaining three landfills in Ljubovija and part of the landfill in City of Loznica. These are planned to be closed and rehabilitated as soon as the Regional Waste Management Centre (RWMC) starts operation. The closure of non-sanitary landfills and dumpsites will be essential for minimising the environmental impacts.

## 2 Project description

### Location of the Project

Regional Waste Management Centre (RWMC) will be located in municipalities Ub and Lajkovac, in the immediate vicinity of thermal power plant Kolubara B. The future regional landfill will be located on a terrain that has suffered a significant anthropogenic impact. The largest part of the considered location is currently a degraded area that served as a borrow area first and tailings dump from surface mines later. There is a pre-existing degradation of the quality of certain segments of the environment in the analysed area, mostly as a result of mining activities and the work of thermogenetic plants.

Works on the construction of a Regional Waste Management Centre (RWMC) "Kalenić" are not expected to further degrade the area, with the possibility for of rehabilitation and re-cultivation of the area, i.e. arranging the space and improving its visual effect.



### Project Purpose

The Project aims at provision of modern solid waste infrastructure compliant with EU standards, contribute to higher service levels, and address pressing environmental challenges in the solid waste sector in line with the National Waste Management Strategy (NWMS). The Project aims to ensure facilities for adequate waste management as well as strengthening of the local municipalities' capacity for waste collection, separation and transfer.

The part of the Project of Regional Waste Management Centre (RWMC) "Kalenic" which will be financed by the EBRD and AFD consists of the following components:

- construction of a Regional Waste Management Centre (RWMC) including a sanitary landfill according to EU standards;
- a Material Recovery Facility (MRF) and a composting facility;
- funding for 4 transport trucks for waste between transfer stations and the regional centre;
- establishment of a primary and secondary waste sorting system including domestic composting throughout the region.

### Project Implementation Phases

**Phase I** – Construction of infrastructure - roads, plateaus, facilities (administrative building, vehicle washing facility, workshop), as well as first cell of the landfill body.

**Phase II** – Disposal of waste in sanitary way, while in parallel, works will be performed on expansion to second cell. It is also expected that the construction works on gas utilisation facility, leachate treatment facility, composting plant and Material Recovery Facility (MRF) will be performed in this Phase.

**Phase III** – Construction of the MBT facility.

## Project alternatives

Six different scenarios were envisaged as the alternatives for regional waste treatment and focused on comparison of different waste treatment technologies. Conclusion of the Feasibility Study is that Option 4 in the Table below is the best option.

Analysed scenarios	Advantages	Disadvantage
<b>Option 1:</b> Sanitary landfill only (with no waste treatment)	Satisfies the immediate needs of region and is a necessary element for disposal of residuals regardless of the future treatment option	Does not contribute to diversion of biodegradables Landfill volume is maximum
<b>Option 2:</b> Construction of a simple Mechanical Biological Treatment (MBT) plant without any recovery of recyclables, aiming only to biostabilisation and production of a Compost-Like Output (CLO) product	Waste mass loss about 35% of input to composting. Satisfies the minimum requirements of Landfill Directive due to lower environmental impact of Compost-Like Output (CLO) disposal compared to mixed waste	Recovery of metals only Stabilised output or Compost-Like Output (CLO) may have minimal uses in restoration of brownfields or old dumpsites and will be mainly landfilled (due to impurities content)
<b>Option 3:</b> Construction of an Mechanical Biological Treatment (MBT) plant with recovery of recyclables, followed by tunnel composting in a closed building and production of compost like output	Recovery of a range of recyclables through separators and hand-picking Recovery of a waste derived fuel, Refuse Derived Fuel (RDF), suitable for industrial kilns Production of a stabilised output with reduced mass but landfilled (due to impurities content)	Higher operating cost The market of Refuse Derived Fuel (RDF) is fluctuating but developing, mainly with a negative cost.
<b>Option 4:</b> Construction of an Mechanical Biological Treatment (MBT) plant, with configuration to produce secondary fuel Solid Recovered Fuel (SRF) (biodrying)	SRF is a more valuable commodity and is preferred to Refuse Derived Fuel (RDF) when a constant level of energy is desired Solid Recovered Fuel (SRF) output is of higher added value.	European Commission demands separate contract for Solid Recovered Fuel (SRF) utilisation to proceed to co-financing as end product depends on private sector Low recycling rate

<b>Option 5:</b> Mechanical Biological Treatment (MBT) with anaerobic fermentation and energy recovery	Targets the high organic content in waste It caters for biogas production and is a source of renewable energy There is a track record of dry Anaerobic Digestion (AD) plants across Europe	It is a relatively expensive method Investment is sensitive to kWh price
<b>Option 6:</b> Waste to Energy (WtE) plant	Last generation Waste to Energy (WtE) plants are more efficient and provide for significant reduction of waste mass and negligible emissions Very low emissions and flexibility to treat potential Refuse Derived Fuel (RDF) streams from other regions	High gate fees. Authorities are bound by strict contracts “bring or pay” and need to be highly skilled during tendering process Uncertain co-financing of the Waste to Energy (WtE) plant Possible hazardous residue

However, when financial parameters were taken into account, the Municipalities forming the Regional Association have agreed to adopt Option 1 for the Phase I of the Project.

Through implementation of the Phase II and Phase III of the Project, it is planned that future waste treatment is aligned with the Option 4, which will be reassessed and adjusted in line with the National Waste Management Strategy (NWMS), current market capacity needs and best available treatment technology.

### 3 Environmental and Social Impacts

#### Environmental Impact Assessment Process

The environmental assessment of the Project has been done through the Environmental Impact Assessment (EIA) which was updated in 2020. EIA complies with latest EU EIA requirements, national legislation and Regional Plan for waste management developed and adopted for period 2019 – 2029. Ministry of Environmental Protection (MoEP) issued a Consent on revised EIA in July 2020. Additional E&S assessment of the Project has been undertaken in 2021 with the aim to identify gaps between the existing documentation, national legislation requirements and requirements of Lenders and EU Directives.

According to the EIA, construction of new regional landfill “Kalenic” will lead to improvement of waste management in the region. The landfill is designed and is planned to operate in compliance with the national and international (EU) standards and regulations. EIA addressed negative impacts during construction and operation phase as well as mitigation measures.

#### Project benefits

In general, the Project is expected to have positive environmental impact on users, waste management in the region as well as to the environment. Use of sanitary landfill will ensure reduced environmental impact (low odours, animals, and risk of fire), health risks and better control over waste compared to non-regulated landfills.

Following key benefits of the Project have been identified:

- Expand the collection system in urban and rural areas,
- Develop selective collection system,
- Upgrade and modernize existing waste collection and transportation equipment (vehicles, bins, etc.),
- Envisage suitable measures for special waste streams via sufficient available collection points and “take back schemes” in accordance with specific EU Directives and local regulations,
- Optimise waste transfer to the regional landfill via use of transfer stations in municipalities of Valjevo, Lazarevac and Koceljeva and transfer point in Obrenovac,

- Recovery/ recycling of packaging waste, according to the provisions of the national and international legislation,
- Construction of a regional sanitary landfill in the municipality of Ub, compliant to EU Landfill Directive,
- Promote home-composting and biowaste composting,
- Closure and rehabilitation of non-sanitary landfills and dumpsites.

#### Potential impacts and mitigation measures

As a part of the additional environmental and social assessment of the Project undertaken in 2021, key risks, impacts and mitigation measures have been identified. Based on the findings, Environmental and Social Action Plan has been developed as well as Stakeholder Engagement Plan and Land Acquisition and Resettlement Framework. These will be later used by the Eko-Tamnava d.o.o. Ub and the future Contractor to prepare detailed Project specific Construction Environmental and Social Management Plans (CESMPs) which will be implemented during the construction phase. Eko-Tamnava will be responsible for preparation of the Operation Environmental and Social Management Plans (OESMP) which will cover all risks and ensure implementation of relevant mitigation measures.

Through implementation of these plans Eko-Tamnava and the future Contractor will ensure that any future impact of the Project is adequately managed, and Project is implemented in line with relevant national legislation, EU and Lenders requirements.

Identified potential impacts of the yet to be defined solutions for additional facilities of the Regional Waste Management Centre (RWMC) “Kalenic” are presented in the table below:

Supplementary Environmental and Social Impact Assessment	
Possible Impacts	Proposed Mitigation Measures
<p><b>Environmental impacts of the project components planned for the next phase(s) of development of the Regional Waste Management Centre (RWMC) “Kalenic” have not yet been assessed.</b></p> <p>(Material recovery Facility (MRF), Mechanical Biological</p>	<p>In parallel with developing the design documentation for all landfill components that are planned to be constructed (and not yet fully defined), <b>supplementary E&amp;S impact assessment</b> is required to be undertaken and approved prior to start of construction of each component.</p> <p>EIA will be revised/ updated accordingly in order to inform overall impact, assess adequacy of mitigation measures and define additional if deemed necessary.</p>

Treatment (MBT), composting facility, leachate treatment facility))	
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Identified potential impacts and proposed mitigation measures relevant for the construction and operation phase of the Project are summarized in the following tables:

Construction phase	
Possible Impacts	Proposed Mitigation Measures
Impacts and nuisance during the construction <b>works on the landfill</b> – that can <b>impact on soil, water and groundwater</b> (noise, impacts, air quality, dust, fuel spills, generation of construction and communal waste)	Construction E&S Management Plans which includes Waste Management Plan (including wastewaters) will be developed before the start of construction to ensure minimal pollution as a result of construction works.  Future Contractors (and subcontractors) will need to submit certificate of compliance with the regulations on the maximum noise of construction mechanisation and to also perform regular maintenance of the vehicles.
<b>Employment and working conditions</b> - EBRD requirements and Serbian national conditions regarding personnel policy, labor relations, non-discrimination and equal opportunities, organization of workers, salaries, benefits and working conditions, and accommodation of workers.	The Contractor will need to establish a personnel policy and procedures (HR) for the implementation of EBRD requirements and Serbian national conditions.  The Contractor will be obliged to develop and implement a grievance mechanism for workers in accordance relevant requirements.  The Contractor and subcontractors will ensure that workers are aware of and have access to the grievance mechanism of the Eko-Tamnava d.o.o. Ub.
Although no registered <b>cultural heritage</b> sites will be affected by the execution of the works, chance findings are still possible.	The Contractor will develop Chance Finds Procedure to prepare for any chance findings and ensure that no cultural heritage sites are affected.
<b>Health and Safety</b> - Impact on workers, community, traffic and existing structures.	The Contractor will be responsible to develop and implement Project Specific Construction H&S Management Plan to ensure adequate mitigation measures relevant for health and safety of workers, community, traffic and existing structures in the areas affected by construction works.
<b>Stakeholder Engagement</b> - People affected by the Project and other stakeholders not adequately informed and consulted about the risks and impacts of the Project.	Stakeholder Engagement Plan will be implemented by the Eko-Tamnava d.o.o. Ub to manage consultations and communication with the Project affected people and other relevant stakeholders.
Operation phase	

Possible Impacts	Proposed Mitigation Measures
<b>Community Health and Safety</b> – Risk from spreading waste, by birds, rodents, insects or wind. Uncontrolled access of people and animals. Risk of fires.	Eko-Tamnava d.o.o. Ub will implement measures for protecting the community by covering waste with inert material in order to stop the spread of disease by animals and to protect from the risk of fire. Also, placing the fence will prevent spreading the waste by wind and it will control the access to the landfill.
<b>Operational Safety Management System</b> All risks associated during the operation phase of the Project	Eko-Tamnava will establish the Operational Safety Management System to ensure that all safety risks relevant to operational phase (occupational, community, traffic, hazardous waste, flooding, emergency situations etc.) are assessed and adequate mitigation measures developed and adequately implemented.
<b>Performing regular inspections</b> – Is needed in order to control potential adverse impacts on the environment, and to timely identify potential risks on environment.	Regular, daily control – In order to adequately keep records, Eko-Tamnava will control parameters such as quantity and composition of the unloaded waste; regular maintenance of facilities for waste disposal, access roads and the entire waste receiving zone; maintenance of the equipment and work hours, quantity of used and available material for covering; changes in the surrounding area, the presence of infectious agents; monitoring the groundwater level in wells and measuring the amount of rainwater in the area of landfill.
<b>Potential soil and water contamination</b> <b>Air quality / emission</b>	The Project envisages installation of the waterproof layer, controlled collection of wastewater and landfill gas to prevent soil and air contamination.  Leachate treatment facility will be constructed as a part of the complex to prevent any possible contamination from waste waters.
<b>Controlling of compliance</b> – Comparison of the generation of waste from the project design and from conditions on site during operation.	Comparison of real data on site with the data from design in order to timely undertake measures, if needed and to harmonise project design with actual conditions on the landfill during operation.
<b>Education of the public</b> - know-how of the new waste management system.	Eko-Tamanava in cooperation with Ministry and local municipalities will develop a Community Awareness Program/Campaign which will introduce two waste bins separation system, raise awareness and provide practical guidelines for the use of new system.

## Generic E&S impact assessment of the facilities planned for the Phase II and Phase III

Assessment provided in the Table below represents generic benefits, impacts and mitigation measures relevant for the operation phase.

Phase II facilities			
Facility	Benefits	Possible Impacts	Proposed Mitigation Measures
<b>Material Recovery Facility (MRF)</b>	<ul style="list-style-type: none"> <li>- Sorting of recyclable waste and its preparation for further placing on the market,</li> <li>- Reducing the share of waste that can be recycled or reused in landfilled waste,</li> <li>- Smart waste management and enabling the reuse of certain types of waste.</li> </ul>	<ul style="list-style-type: none"> <li>- Nuisance from animals that can carry disease – vermin (mostly mice, rats and birds),</li> <li>- Air quality impacts, odours and dust,</li> <li>- Wastewaters from the facility can be polluted due to the impact of waste and if not collected adequately can lead to soil and water pollution,</li> <li>- Waste scattered by wind or accumulation of waste outside the facility.</li> </ul>	<ul style="list-style-type: none"> <li>- Consider involving appropriate nets, traps, and the organization of the facility itself in design phase. Good housekeeping and hygiene maintenance,</li> <li>- Smart facility planning which will include adequate ventilation and dust extraction system helping in odours and dust reduction and control,</li> <li>- Provision waterproof surfaces in and around the facility and dewatering to be undertaken through drainage system for contaminated wastewater ending up in the leachate collection ponds,</li> <li>- There will be no storage of waste or recyclable materials outside the MRF building at any time unless it is in sealed waterproof shipping container. The container seals are the subject of daily inspection and maintenance,</li> <li>- Regular monitoring of environmental parameters and implementation of the procedures in case of exceeding the limit values.</li> </ul>
<b>Composting Plant / Facility</b>	<ul style="list-style-type: none"> <li>- Reduction of the biodegradable waste in landfill,</li> <li>- Reduction of greenhouse gas (GHG) emissions, particularly CO<sub>2</sub> emission,</li> <li>- Composting enriches the soil with nutrients, which reduces the need for fertilizers and pesticides. Compost can be used for improving structure of the soil by adding important nutrients, balancing PH levels, and allowing for better moisture infiltration and retention.</li> <li>- Composting can help sequester carbon, meaning that composting can help remove carbon from the atmosphere. Studies have shown that plants grow more rapidly in soil supplemented with compost, meaning they can pull more carbon dioxide out of the air.</li> </ul>	<ul style="list-style-type: none"> <li>- Gases released by composting, such as NH<sub>3</sub>, CH<sub>4</sub> and N<sub>2</sub>O and other, can impact air quality,</li> <li>- Air quality impacts, odours and dust,</li> <li>- Contamination of water and soil by wastewaters from the plant which contains organic polluters,</li> <li>- Surface water run-off from composting facility can cause unacceptable loads of sediment and suspended solids in receiving waters,</li> <li>- Presence of vermin,</li> <li>- Uncontrolled biogas emissions may create an explosion or fire risk and impose risks to humans,</li> <li>- Increased noise levels from equipment.</li> </ul>	<ul style="list-style-type: none"> <li>- Design of the facility, coupled with the proposed operating procedures, must ensure that the predicted and expected impacts are addressed to the possible extent at the design stage,</li> <li>- All plant used for processing (e.g. pre-treatment, decomposition, aeration and maturation) and the storage and or movement of raw organics and products must always be maintained and operated in an efficient manner to prevent air pollution from the premises,</li> <li>- Working surfaces, including the incoming organics and product storage areas must be waterproofed and dewatering to be undertaken through drainage system for contaminated wastewater ending up in the leachate collection ponds,</li> <li>- Establishment of procedures and training of staff to meet the requirements of the OHS standards,</li> <li>- Regular monitoring of environmental parameters and implementation of the procedures in case of exceeding the limit values.</li> </ul>
<b>Leachate Treatment Plant / Facility</b>	<ul style="list-style-type: none"> <li>- Reducing serious environmental threats posed through discharge of high-strength polluted leachate.</li> </ul>	<ul style="list-style-type: none"> <li>- Possible pollution of the water, soil and groundwater due to the leakage of leachate and other categories of wastewater,</li> </ul>	<ul style="list-style-type: none"> <li>- Design of the facility, coupled with the proposed operating procedures, must ensure that the predicted and expected impacts are addressed to the possible extent at the design stage,</li> </ul>



Phase II facilities			
Facility	Benefits	Possible Impacts	Proposed Mitigation Measures
		<ul style="list-style-type: none"> <li>- Leachate infiltrations as result of the damage of the waterproofing system,</li> <li>- Accidental discharge of insufficiently treated waste waters,</li> <li>- Air quality impacts, odours and release of toxic gases.</li> </ul>	<ul style="list-style-type: none"> <li>- Control of the effluent for relevant parameters,</li> <li>- Waterproofing layer monitoring system,</li> <li>- Regular monitoring of environmental parameters and implementation of the procedures in case of exceeding the limit values.</li> </ul>
<b>Gas collection and utilisation system</b>	<ul style="list-style-type: none"> <li>- Generating energy and reduce methane emissions,</li> <li>- Overall reduction of greenhouse gas (GHG) emissions,</li> <li>- Producing energy from offsets the use of non-renewable resources, such as coal, oil, or natural gas,</li> <li>- Destroying most of the non-methane organic compounds (including hazardous air pollutants) which reduces possible health risks from these compounds,</li> <li>- Gas collection can improve safety by reducing explosion hazards from gas accumulation in structures on or near the landfill,</li> <li>- Generating electricity from landfills is also a relatively cost-effective way to provide new renewable energy generation capacity to supply community power needs.</li> </ul>	<ul style="list-style-type: none"> <li>- Flaring process adds to GHG emission, however overall impact of the system when compared to “no use” option is still beneficial.</li> </ul>	<ul style="list-style-type: none"> <li>- Regular monitoring of environmental parameters and implementation of the procedures in case of exceeding the limit values.</li> </ul>

**Materials recovery facility (MRF)** is a specialized plant that receives, separates and prepares recyclable materials for marketing to end-user manufacturers. There are two types of Materials recovery facilities (MRFs): 'dirty' and 'clean'. A 'dirty' materials recovery facility (MRF) receives mixed waste material that requires labour intense sorting activities to separate recyclables from the mixed waste. A 'clean' materials recovery facility (MRF) is a facility that accepts source separated or commingled recyclable materials. A 'clean' Materials Recovery Facility (MRF) reduces the potential for material contamination. Based on estimation that about 20% of the generated waste will be separated by primary selection (bulky waste, recycles, organic waste for compost, etc.) expected quantity of waste that will be delivered to material recovery facility is 63.789 t/year, or 245 t/day. Based on the required daily capacity of 245 t/day, the material recovery facility (MRF) of 20 t/h, or 280 t/day, was adopted.

**Composting plants** are designed to utilize organic waste materials from slaughterhouses, meat and fish processing, as well as food waste, paper, timber, garden waste and animal manure. Composting plants are an important step in minimizing the landfilling of organic waste and, in reaching environmental goals for a given area. Capacity and technology of future composting plant that will be part of the Regional Waste Management Centre (RWMC) “Kalenic” is still to be defined. They will be conditioned by data on the amount of waste that is primarily allocated for composting and the amount that is processed at pilot composting plants. According to the data within the Regional Waste Management Plan for the Kolubara region, the capacity is not expected to be less than 20.000 t/year.

On-site **leachate treatment** is an alternative to the increasing costs associated with hauling leachate to a local wastewater treatment plant. **Leachate treatment facilities** are designed to fulfil the specific needs of individual landfill sites and allow discharge to a sanitary sewer or water body without any hauling or disposal costs. Design for building

permit envisages leachate recirculation system for the future landfill, with an option to discharge treated surplus leached into the city sewerage network. The **future solution will include biological treatment of leachate**, in accordance with the technologies available at the time on the market. **Biological leachate treatment** is a proven technology for organics and ammonia removal in young and mature leachate. The anoxic/aerobic processes achieve nitrification and denitrification and reduce the oxygen demand for landfill leachate treatment. According to the Design, based on the calculation for phase I, the maximum amount of leachate in the ponds is 6.401 m<sup>3</sup> cassette 1, 5.920 m<sup>3</sup> cassette 2 and 6.455 m<sup>3</sup> for cassette 3. The maximum amount of leachate that will be recirculated is 2000 m<sup>3</sup> per month for all three cassettes was adopted. Phase I comprises one cell divided into three cassettes.

**Landfill gas** is a natural by-product of the decomposition of organic material in landfills. Landfill gas is composed of roughly 50 % methane (the primary component of natural gas), 50 % carbon dioxide (CO<sub>2</sub>) and a small amount of non-methane organic compounds. Instead of escaping into the air, landfill gas can be captured, converted, and used as a renewable energy resource. **Capturing / collection of the landfill gas** helps to reduce odours and other hazards associated with landfill gas emissions and prevents methane from migrating into the atmosphere and contributing to local smog and global climate change. **Chosen option for landfill gas management is controlled discharge by a degassing system and then its flaring.**

**Mechanical biological treatment (MBT)** system is a type of waste processing facility that combines sorting facility with a form of biological treatment such as composting or anaerobic digestion. MBT plants are designed to process mixed household waste as well as commercial and industrial wastes.

As anticipated, all the facilities will be part of Regional Waste Management Centre (RWMC) “Kalenic” and will be located on the Cadastral Parcel 800 Cadastral Municipality Kalenic.

Table below lists minimum relevant National and EU legislation.

EU Directive / Standard	National Law and Regulations
Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe	Law on Waste Management ("Official Gazette of RS", No. 39/09, 88/10, 14/16 and 95 / 18-other law)
The Water Framework Directive (2000/60/EC, 2008/32/EC)	Regulation on landfills waste disposal (Official Gazette RS, no. 92/2010)
Groundwater Directive (2006/118/EC, 2014/80/EU)	Law on packaging and packaging waste ("RS Official Gazette" No. 36/09 and 95/2018)
Waste Framework Directive (2008/98/EC amended by Directive 851/2018/EC)	Law on Transport of Dangerous Goods ("Official Gazette", No. 104/2016, 83/2018, 95/2018 and 10/2019)
Landfill Directive (Directive 1999/31/EC, 2003/33/EC)	Waste Management Strategy for the period 2010 - 2019 ("Official Gazette of RS", no.29/10)
Directive 2009/28/EC on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC	Water Act (Official Gazette RS, no. 30/2010, 93/2012, 101/2016, 95/2018)
Directive 2010/75/EU on industrial emissions	Regulation on discharge limits of pollutants in water bodies and deadlines for compliance (Official Gazette RS, no. 67/2011, 48/2012 and 1/2016)
Urban Wastewater Treatment Directive (91/271/EEC)	Law on Air Protection: 36 / 2009-60, 10 / 2013-30, 26 / 2021-3 (other law)

## 4 Engagement with stakeholders

Information on the company's operations, relevant news and company contacts are displayed on the official website (<http://www.ekotamnava.rs/>). The website is still being built, and it is planned to contain segment "Eco Culture" which will present educational content on waste management and recycling.

To ensure ongoing communication with the public a Project-specific Stakeholder Engagement Plan (SEP) was developed and includes a grievance mechanism.

### Grievance Mechanism

The main objective of the grievance mechanism is to assist Project Affected Persons in efficient and outcome effective resolution of grievances related to the Project activities. Furthermore, it will act as a mediator in disputes arising from Contractor's activities and acts of other parties involved in implementation of the Project with the aim to minimize residual impacts and avoid, whenever possible, initiation of lengthy and costly judicial processes.

Any person or organisation may send comments, complaints and/or requests for information in person or via post, telephone or email using the grievance form and contact information provided on Eko-Tamnava d.o.o. Ub, website, on the local municipalities notice board and website, at the site offices. The reception of grievance should be formally acknowledged through a personal meeting, phone call, email or letter as appropriate within 7 working days from submission. If the grievance is not well understood or if additional information is required, clarification will be sought from the complainant at this time. The person/organization that submitted the grievance should be provided with contact information of the person responsible for its resolution and the estimated time for completion. If any grievance cannot be addressed or if action is not required, a detailed explanation / justification will be provided to the complainant on why the issue was not addressed. The response will also contain an explanation on how the person / organization that raised the complaint can proceed with the grievance in case the outcome is not satisfactory.

All grievances will be responded to within 30 working days from submission. In case of delay, complainants will be notified about the reasons for the delay and the expected timing for when their grievance will be addressed. The proposed resolution

should be confirmed with the complainant before implementation to minimise unnecessary/unwarranted actions. If they agree with the approach required actions are implemented to deal with the issue. Completion of actions is recorded in the Grievance Log Register. The response is signed off by the appropriate manager. This includes either signing off the Grievance Log Register or confirming in official correspondence (which will then be filed with the grievance to indicate agreement and referenced in the register).

A grievance form is at the end of the document.

### Contact Information

Regional centre for waste management 'Eko-Tamnava' d.o.o. Ub Regionalni centar za upravljanje otpadom "Eko-Tamnava"d.o.o. Ub	
Department for Public Relations Služba za odnose sa javnošću	
Address	Veljka Vlahovica br 8, 14210 Ub
Telephone:	+381 14 412 415
E-mail address:	<a href="mailto:office@ekotamnava.rs">office@ekotamnava.rs</a>
Web	<a href="http://www.ekotamnava.rs">http://www.ekotamnava.rs</a>

Contact details of the contractor(s) will be added once the contractor(s) have been identified.

## Public Grievance Form

<b>Reference No:</b>	
<b>Full Name</b>	
<b>Contact Information</b>	<input type="checkbox"/> <b>By Post: Please provide mailing address:</b> _____ _____ _____
Please mark how you wish to be contacted (mail, telephone, e-mail).	<input type="checkbox"/> <b>By Telephone:</b> _____ <input type="checkbox"/> <b>By E-mail</b> _____
<b>Description of Incident or Grievance:</b>	What happened? Where did it happen? Who did it happen to? What is the result of the problem?
<b>Date of Incident/Grievance</b>	<input type="checkbox"/> <b>One-time incident/grievance (date _____)</b> <input type="checkbox"/> <b>Happened more than once (how many times? _____)</b> <input type="checkbox"/> <b>On-going (currently experiencing problem)</b>
<b>What would you like to see happen to resolve the problem?</b>	