State of the Nation Report

Landfilling Practices and Regulation in Serbia

Contents

SERBIA

1. Summary of Solid Waste Management Sector

The overall policy of the Serbian government is to develop a new, more sustainable waste management system trough regionalization. Until recently waste management in Serbia was based only on collection and waste disposal at not strictly sanitary landfills, but often on small open dumps. In order to change existing practice the main goals of waste management in Serbia are increase in selection and separation of recyclables, especially of packaging waste, and disposal of remaining waste at sanitary (regional) landfills.

At the moment, most of the landfills in Serbia are public owned. There are no waste combustion plants (incinerators) or other waste to energy facilities. Selection of waste and its separation is on very low level.

Table 1. Overview of existing landfilling practice in Serbia

Existing Sanitary landfills	Number of citizens / waste (t/year)	% of total waste generated
Kikinda	67.002 (16480)	**3,95%**
Lapovo (Lapovo, Batočina, Despotovac, Velika Plana, Rača)	99.698 (14480)	
Leskovac (Leskovac, Bojnik, Lebane, Medveđa, Vlasotince, Crna Trava, Vladičin Han, Surdulica)	240.621 (50421)	
Sanitary landfill under construction, EU funding, 2010		
Sremska Mitrovica (Sremska Mitrovica, Šabac)	209.057 (46905)	**7,24%**
Pirot (Pirot,Babušnica,Bela Palanka, Dimitrovgrad)	100.133 (19676)	
Užice (Užice, Arilje, Bajina Bašta, Čačak, Čajetina, Ivanjica, Kosjerić, Lučani, Požega)	371.010(82366)	
Total (comparing to entire country)	**14,5%**	**11,19%**

*Other generated waste is deposited into uncontrolled landfills

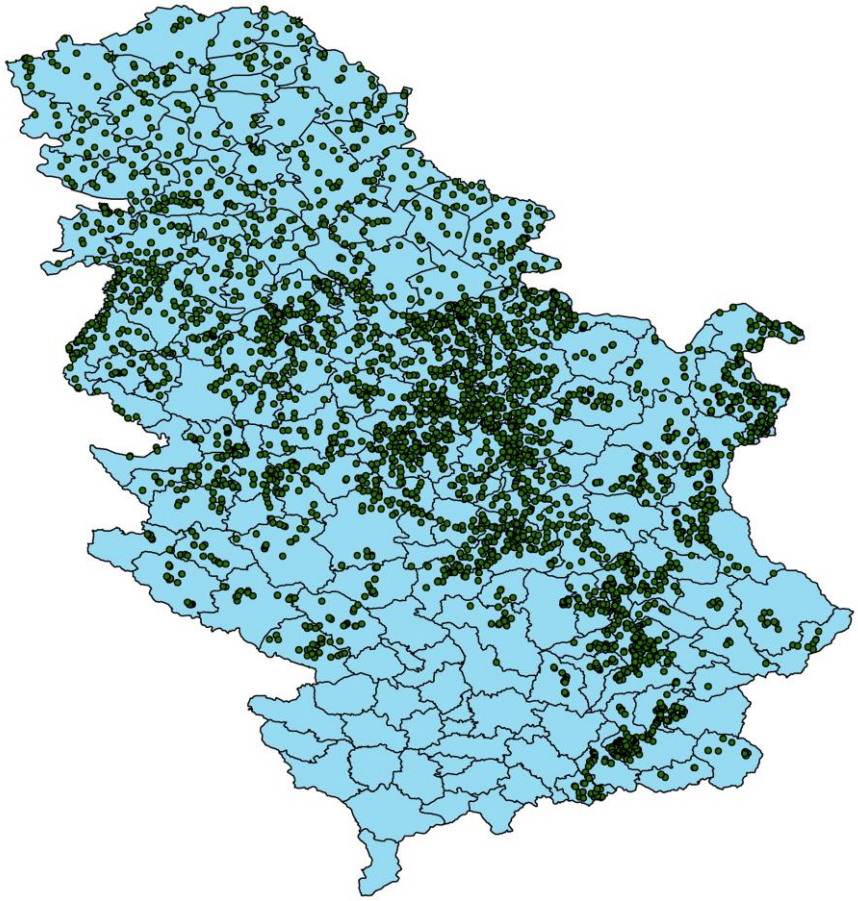

Figure 1: Location of landfills in Serbia /4/

Recent investigation of landfill shown than there is more than 3000 landfills in Serbia, where majority are small open dumps (Table 1.)

Table 2. Data on Landfills in Serbia /4/

Criteria [m^3]	Numeber of Landfills	Total Area [ha]	Total Volume[m^3]
do 1.000	2.702	154,50	604.628,93
od 1.001 do 10.000	698	480,04	2.251.995
od 10.001 do 100.000	131	313,11	4.087.590
od 100.001 do 500.000	37	199,24	8.693.492
od 500.001 do 1.000.000	7	62,59	5.296.214
preko 1.000.000	7	131,98	23.123.124
Ukupno	3.582	1.341,46	44.057.045

2. Overview of Landfill Practices

Republic of Serbia general policy of waste management is described in The Act on Waste Management and The Waste Management Strategy which is described in the following text.

Landfill management practices

Until 2009, landfill sites have not been constructed according to European standards and they do not meet minimum technical requirements which protect the environment and public health. They have been built without bottom liner and leachate treatment systems, often located on a location outside the city where some sort of excavation was done. Also, there are no systems for landfill gas collection and treatment so far.

In 2009, Serbia started building regional sanitary landfills. These landfills are designed to operate to strict technical standards in order to reduce environmental effects and protect public health.

When waste is received it is weighed and checked to ensure it is compliant with the landfill operating licence. The waste is sorted, and rest of it is deposited, compacted and covered to prevent odour and litter. Waste covering frequency is variable and it is not based on daily basis. Leachate is removed through a system of pipes and is being sent to wastewater treatment.

All the gas generated will be removed through a collection system of pipes. It is likely the gas will be utilised and any residual gas combusted in an open or enclosed flare. There are no landfill gas plants in Serbia at the moment.

On landfill closure waste is levelled, compacted and covered completely with bentonite carpet or HDPE foil, after which comes 1 m of clean soil. This is called the final cover, and its purpose is to prevent the landfill gas from escaping freely into atmosphere and prevent atmospheric waters from infiltrating into the landfill body. Accumulated leachate is being re-circulated to maintain the optimum moisture of disposed waste. The gas collection and treatment system needs to be supervised in next 20 to 30 years.

Current Status and Trends for Landfill Design

Landfill design in Republic of Serbia consists of an HDPE bottom liner, a final cover, a leachate collection and treatment system, and landfill gas collection and treatment system. The depths of waste depend on the location of the landfill and availability of space. Landfills are typically designed with a slope steepness of 3 to 1.

To use the available landfilling space at sanitary landfills as best as possible, there is a primary separation of waste or a separation line at the landfill site. At the moment the organic waste is disposed at landfills rather than turned into compost.
Landfill gas is a greenhouse gas which is generated as a result of anaerobic degradation of organic waste inside the landfill body. To collect this gas a network of vertical gas wells is installed on landfill body and connected to a pipeline. The pipeline is connected to a blower station and subjected to negative pressure thus creating an active gas extraction system. Depending on the purpose intended for the collected gas, it is purified, and sent to a flare station, IR heaters, boilers or electric generators for final use.

3. Key Stakeholders in the solid waste disposal sector relating to Landfill

Some of the key Stakeholders connected to Landfills in Serbia include: Ministry of Environemnt, Mining and Spatial Planing, SEPA – Serbian Environment Protection Agency, SeSWA – Serbian Solid Waste Associoation, Local Authorities and Public and Private Waste Management Companies.

4. Legal and Policy Frameworks for Landfill

Ministry of Environment, Mining and Spatial Planning issued an Low on Waste Management and Waste Management Strategy, which regulate waste management, waste reuse, recycling, and landfills in Republic of Serbia.

The Republic ministry of environment, mining and spatial planning, provincial secretariat for education, administration and national communities, and local government are the permit authority regarding environmental permits on landfills. All new landfills are as a main rule equipped with liners and leachate collection systems.

In the case of inspection authority this task is handled by government's and local Environmental Inspection as regarding all public owned landfills; whereas the municipalities, in general, are the inspection authority regarding private owned landfills. There are several levels of inspection in Serbia. First there is municipal inspection, then provincial inspection and finally republic inspection.

The competent body of local authorities:
- Adopts a local waste management plan, provides conditions and takes care of its implementation;
- Regulates, provides, organizes and implements management of municipal, that is inert and non-hazardous, waste on its territory;
- Regulates the process of collection services in the areas of municipal, that is inert and non-hazardous, waste;
- Issues licenses, permits and other documents in accordance with the law, keeps records and passes information to the Ministry;
- At the request of the Ministry or the competent authorities of the autonomous province provides opinion in issuing permits;
- Supervises and controls the implementation of waste management actions in accordance with law, as well as other activities stipulated by law./1/

The competent authority of the autonomous provinces:
- Participates in the development of waste management strategies and individual national waste management plans;
- Adopts the Waste Management Plan for certain important types of waste for autonomous region in accordance with The Strategy and National Plan;

- Coordinates and carries out waste management activities of importance to the autonomous province and monitors the situation;
- Approves the regional waste management plans at its territory;
- Issues licenses, approvals, certificates and other documents in accordance with the law, maintains records and delivers data to the Ministry;
- Supervises and controls the implementation of waste management actions in their territory;
- Performs other tasks stipulated by law.

Two or more units of local government adopt a regional waste management plan which defines the common goals of waste management. Development and adoption of regional waste management plan shall be regulated by agreement of assemblies of local authorities. The regional waste management plan is approved by the Ministry or the competent authority of the autonomous province within its territory./1/

Policies or mandates that may affect waste streams (e.g., organic waste diversion, recycling)

There are goals in government policy regarding reduction of biodegradable waste in Republic of Serbia, and they are stated in The Regulation of Waste Disposal, but their application will start in year 2016.

In period from 2012 to 2016, at least 25% less (in weight) of biodegradable waste will be disposed at landfills. By 2019 this number needs to be at least 50% and by 2026 this number needs to rise at least to 65%. /2/

With Regulation Establishing a Plan to Reduce Packaging Waste national goals for recycling and reusing of waste are determined and the goals are 25% of recycled waste and 30% of waste to be reused by the year 2014. /3/

5. Domestic Country Strategy

The long term policy of Serbian government is raising the quality of living through protection of environment and sustainable environmental management. Waste Management Strategy represents basic document which provides the terms for reasonable and sustainable waste management at national level. /1/

The Serbian waste management policy consists of 5 elements:

1. Reducing the generated waste amounts,
2. Reducing the waste amount deposited at landfills through selection of useful waste,
3. Reduction of biodegradable waste deposited at landfills,
4. Reduction of deposited waste influence on environment, climate and human health,
5. Waste management with sustainable development principles.

Although Republic of Serbia still does not have obligation to implement goals from EU directives regarding waste treatment, inclusion of these requirements and establishment of integral waste management system is one of the priorities for government of Republic of Serbia.
In accordance with National Strategy for Sustainable Development, for reaching of national goals it is necessary to rationalize consumption of raw materials and energy, to use alternative fuels derived from waste, to reduce the risk to future generations from improperly disposed waste, to ensure stable financial sources and incentive mechanisms for investments and implementation of activities according to principles "Polluter pays" and/or "User pays", establishment of unified waste information system, increase in population included in municipal waste collection system, establishment of standards and capacities for waste treatment, reuse and recycling of waste, raising public awareness regarding waste problems at all society levels, etc.

List the elements the country is using and plans to use to overcome the barriers and promote methane emission reductions from landfills.

In Republic of Serbia methane emission reduction is not regulated through obligatory landfill gas collection and burning at flares or usage in energy projects.

Republic of Serbia ratified Kyoto Protocol but it is not a member of Annex I countries so there is no obligation for methane emission reduction plan development.

6. References and Sources

/1/ Waste management strategy for period 2010 – 2019, Ministry of Environment, Geology and Spatial Planing, 2010.

/2/ Regulation of waste disposal at landfills ”Official Gazette RS”, No. 92/2010

/3/ Regulation establishing a plan to reduce packaging waste for the period 2010 – 2014, October 2009

/4/ Project of indetification of small landfill in Serbia, Faculty of Technical Sciences, University of Novi Sad, Serbia