

SOIL POLLUTION WITH HEAVY METALS IN MITROVICA, KOSOVA

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ABSTRACT

The region of Mitrovica as an industrial region has numerous environmental problems. As a result of mining-industrial processes which are applied in industrial Combine "TREPÇA", the region of this city has been resulted with soil pollution and with high concentrations of heavy metals above the permitted rates of EU limited and allowable values that were recommended by 86/278/EEC. During these processes, specifically obtaining raw materials and finalizing them are created industrial trash, which are stored in industrial landfills: in Mitrovica's Industrial Park, and in the villages Kelmend and Zveqan. As a result of rainfall and strong winds erosive, these landfills, generate pollutants which constantly pollute the soil environment. This project focuses on the investigation and determination of soil contamination (soil) with heavy metals (Pb, Zn, Cd and Cu). The research is supported on the analysis of soil samples by determining the concentration of heavy metals in ten country samples. The determination of the heavy metals concentration was done with atomic absorption of analytical method type (AA 6300 SHIZMADZU). From the research, we conclude that contamination with heavy metals, in this area of study, is very present, and especially the concentration of lead and zinc in this region is at a high level. This situation is very worrying for ecosystems and public health.

Keywords: *soil pollution, heavy metals, concentration, Atomic Absorption Spectrometry.*

STUDY AREA

The study was conducted in the city of Mitrovica, and respectively in the northern part of the city, in Kroi i Vitakut, in Suhodoll village, in the city center along the bed of river Iber, in the Roma Mahalla and the south-western part of the city, in the neighborhood of Ilirida and in the village of Zhabar. The contaminated soil area was divided into ten locations which were polluted by tailings, mine drainage and dust.



Figure 1. Sampling locations in the area of Mitrovica town.

METHODS

The study area covers a surface of approximately 10 km². In total 100 top samples (0-20 cm depth) were collected through the area. Each top sample was a composite sample consisting of three sub samples collected in ten selected locations.

Soil was digested by aqua-regia method (mixture 3:1 HCl/HNO₃).

The determination was made by Atomic Adsorption Spectroscopy (AAS) for Pb, Zn, Cd and Cu.

Threshold values for heavy metals in soil coming from 86/278/EEC and the maximum concentration of heavy metals(HM)in ten locations are reported in Table1.

RESULTS AND DISCUSSIONS

Table1 reports the maximum concentration of Pb,Zn,Cd and Cu measured in Mitrovica town. This study found significant high level of heavy metals in Mitrovica that exceeded the EU limited values.

Locations	Nr.of samles	Maximum concentration of HM in soil (mg/kg)			
		Pb	Zn	Cd	Cu
L1	10	5188.8	301	6.58	128.2
L2	10	2904.9	634	3.06	220.1
L3	10	451.99	563	2.54	214.9
L4	10	716.7	417	2.62	115.7
L5	10	1691.4	839	4	220.9
L6	10	2560.9	5372	8.3	233.9
L7	10	1280.5	581	13.98	235.7
L8	10	1796.5	1248	6.91	279
L9	10	3908.3	6380	11.81	333.6
L10	10	2283.8	752	7.1	261.6
86/278/EEC		300	300	39	140

Table 1. Maximum concentration of heavy metals in soil.

According to the study of land in the area of research, we have noticed that it has a high content of heavy metals, particularly lead and zinc concentrations exceed many times the permissible limits for the presence of heavy metals in soil. The concentrations of Pb and Zn varied from 716.7 to 5188.8 mg/kg, respectively 301 to 6380 mg/kg. Industrial landfills are created as a result of industrial processes, which pose a potential threat to the health of the population in the region of Mitrovica.

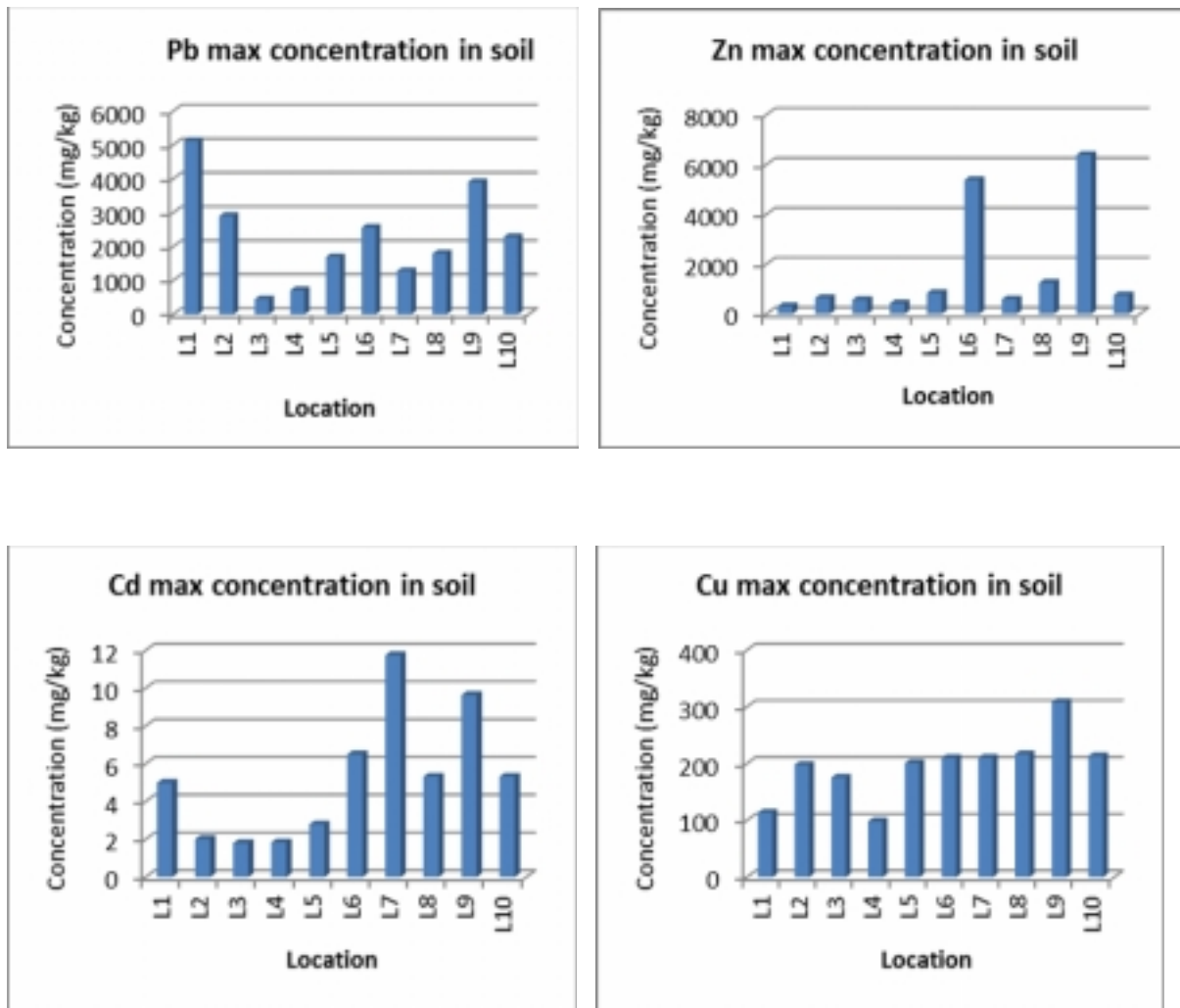


Figure2. Results of the AAS analysis for Pb,Zn,Cd and Cu extracted from soil.

RECOMMENDATIONS

- Continuous monitoring of the level of soil contamination
- Assessing the impact of landfills on the environment
- Construction of embankment around the landfill, in this case would eliminate erosion of industrial waste that cause precipitation and wind.
- Construction of drainage channel around the landfill
- Covering of the tailing with special material,the ground should be pro vegetable
- Rehabilitation of contaminated land by any of the methods of rehabilitation

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