

THE NEED FOR AN ECOLOGIC WASTE STORAGE IN THE MUNICIPALITY OF TÂRGU-JIU, FROM GORJ COUNTY

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Abstract: Waste ecologic storage is the main domestic waste treatment channel in EU. The paper describes the impact of a non-ecological warehouse existing in the municipality of Târgu-Jiu, upon the soil and the need for controlled storage of domestic waste and industrial waste. The necessary field for waste storage has to be mutually agreed upon with the local, sanitary, and environmental protection authorities, based on hydro-geological, topographic studies that allow to set the measures to be taken in order to avoid underground or surface waters, through waters and/or soil infiltrations or surface leaks. The location of the ecologic warehouse was chosen by taking into consideration the distance from urban crowding, the dominant winds direction, the position from water sources and other objectives for which a sanitary protection area has to be preserved. High density clay and polyethylene ecologic warehouse was water-proofed in order to prevent the pollution of underground waters. In conclusion, we can say that the ecologic warehouse built near the municipality of Targu-Jiu from Gorj County complies with EU legislation and prevents the negative impact that the closed warehouse has upon the environment.

1. INTRODUCTION

The development of Tg-Jiu has caused the extension of the residential area to the neighbourhood of the current storehouse which is currently close to the final stage of being filled. The location of this storehouse of the right shore of Jiu river has major disadvantages from the point of view of landscape and may alter the quality of Jiu waters [4].

The types of collected and stored wastes on the waste storehouse platform are:

- Garbage - resulting from household related activities or assimilated to them;
- Street waste - resulting from the traffic lanes of the municipality, from green spaces, animals, etc.
- Urban waste - waste of any kind and of any origin (garbage and related to it, street, commercial waste, etc), which occurs and is managed in the incorporated area of the locality.
- Mud from the treatment station
- Waste related to garbage - waste resulted from trade, industry, public field or administrative ones, with similar composition and properties to garbage.
- Reusable waste - substances, materials or products resulted from industrial, agricultural, constructions, transports, services related activities and to other fields of activity, as well as from population consumption whose characteristics and properties allow them to be reintroduced as such or as secondary raw materials in the active circuit.

The paper describes the negative impact of garbage storehouse from Tg-Jiu municipality upon Jiu River and the need for ecological storage of waste.

2. EXPERIMENTAL

In the case of the analyzed location, the superficial soil constitutes a receptor of atmosphere pollutants or of the contaminations resulting from wastes storage, also becoming a pollution source for the subsoil.

The soil samples were taken from the following areas:

- Point P₁ - the southern extremity of the location, near the access road;

- Point P₂ - central area, the eastern limit of the River Jiu, between the access road and the storage area;
- Point P₃ - the northern extremity of the analyzed location.

The sampling of the soil had as purpose the determination of the potential pollution level with organic synthesis compounds and metals of the superficial soil due to the activity of storing the domestic wastes on the Domestic Wastes Platform, according to the Order No. 756/1997 of MAPPM regarding the regulation of environment pollution.

The soil samples are passed through solution with the help of the mineraliser by oxidation with concentrated sulphuric acid and perhydrol 50%.

The samples are then subjected to flame spectrometry, using the spectrophotometer, an analytical technique used for the qualitative and quantitative determination of an element from a sample. In this method, the sample, in the form of a homogeneous liquid, is introduced in a flame where the chemical reactions create free atoms, capable to absorb, emit or present fluorescence at characteristic wavelengths. In order to excite the free atoms formed in the flame, it is used a radiation source that emits a narrow spectral line with the same wavelength as the one of the transition on an excited energy level.

3. RESULTS AND DISCUSSIONS

The results of the laboratory analyses regarding the metals pollution of soil around the Domestic Wastes platforms Tg-Jiu were compared to the normal values of the soil to the alert and intervention limits for soil a less sensitive usability category and are presented in table 1.

Table 1

The results of the analyses for Cu, Pb, Zn, Co, Cd, Cr, Mn, Ni from the superficial soil samples from the analyzed location compared to the reference values for the less sensitive usability category according to the Order No. 756/1997 of M.A.P.M.M.

| No. | Sample Symbol | Cu ppm | Pb ppm | Zn ppm | Cr ppm | Ni ppm | Mn ppm | Cd ppm | Co Ppm |
|-------------------------------|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Reference values (mg/kg s.u.) | Normal | 20 | 20 | 100 | 30 | 20 | 900 | 1 | 15 |
| | Alert limit | 250 | 250 | 700 | 300 | 200 | 2000 | 5 | 100 |
| | Intervention limit | 500 | 1000 | 1500 | 600 | 500 | 4000 | 10 | 250 |
| 1 | S1/1 | 280 | 200 | 420 | 200 | 60 | 1200 | 0 | 8 |
| 2 | S1/2- | 150 | 3000 | 380 | 270 | 35 | 800 | 0 | 6 |
| 3 | S2/1 | 40 | 300 | 20 | 100 | 30 | 2100 | 0 | 3 |
| 4 | S2/2 | 170 | 1500 | 400 | 150 | 40 | 900 | 0 | 15 |
| 5 | S3/1 | 220 | 600 | 600 | 350 | 35 | 1200 | 0 | 6 |
| 6 | S3/2 | 250 | 950 | 1000 | 600 | 30 | 1000 | 0 | 3 |

The general feature for all soil samples is the high value of metal content, which is over the normal limits in almost all samples close to the alert limit, and in some samples (S2/2) the analyzed values exceeding even the intervention limit.

- **Zinc**

All samples, except for S2/1, exceed the normal value, without reaching the alert limit.

- **Copper**

All samples exceed the normal value without reaching the alert limit, except for the sample S1/1 which exceeds the alert limit value 1.12 times.

- **Chrome**

All samples exceed the normal value without reaching the alert limit.

- **Manganese**

Sample S1/1 exceeds the value of the normal limit, but is under the alert limit values, and the S2/1 sample reaches the alert limit.

- **Lead**

Sampling point P, southern extremity of the location

- Samples S1/1 superficial soil, depth 0,00-0,05 m, exceeds the normal values, not reaching the alert limit

- Sample S1/2 depth 0.05-0.30 m, exceeds the normal values, not reaching the alert limit.

Sampling point P₂ central area of the warehouse, eastern limit towards the access road and the River Jiu.

- Sample S2/1 - superficial soil (depth 00-0.05 m) exceeds the normal values, not reaching the intervention limit.

- Sample S2/2 - superficial soil (depth 0.05 - 0.30 m) exceeds 1.5 times the values of the intervention limits.

The area proposed for building the storehouse for Târgu Jiu has the following neighbours:

- North: beech and hurst beech on the side of Dealul Calului, belonging to the Forest Tour of Târgu Jiu, SC Lafarge Romcim;

- East - the field belonging to CL Târgu Jiu, CF Barsesti technical station'

- West, beech and hurst beech on the side of Dealul Calului, belonging to the Forest Tour of Târgu Jiu

- South, beech and hurst beech on the side of Dealul Calului, belonging to the Forest Tour of Târgu Jiu

The total surface occupied by the future storehouse for waste is 379 000 m², of which 35 550 m² shall be occupied in the 1st stage.

Access to the future storehouse from Târgu Jiu shall be made on the asphalted road DN67 Târgu-Jiu - Baia de Arama and further on a granite paved road, that also provided access for the former clay quarry. The distance to DN67 is almost 2000 m.

The storehouse shall be placed on a thick layer of clay, and the ground resulting from excavating and modeling of the storehouse base shall be used for making the perimeter and division embankments [1-4]

Division embankments shall be made from big used tyres filled with sand and located on 2-3 rows under the form of pyramid trunk, covered by geo-membrane.

4. CONCLUSIONS

Uncontrolled storage of waste has a negative impact upon soil. Ecologic storage of waste in the municipality of Târgu-Jiu complies with the European regulations for protecting environment factors and people's health.

5. REFERENCES

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