THE IMAPCT OF A DOMESTIC WASTES WAREHOUSE FROM THE CITY OF TG-JIU ON THE JIU RIVER

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The development of the City of Tg - Jiu similar to any urban agglomeration, determined a significant increase in the quality of wastes which need to be stored.

Energetic industry, agriculture and domestic activities are important sources for wastes generation qualitatively, as well as from the point of view of the impact on the environment. The domestic wastes dump of the city of Tg – Jiu is placed outside the city, on the right shore of the Jiu River. The main pollution source for the water is the levigat resulting from the percolation of the wastes dump towards the waters coming from precipitations.

In order to investigate the water quality, there were taken two surface water samples from the river Jiu. Until this moment, the monitoring drillings execution was not completed; this is why the underground water samples could not be taken and analysed as well. The experimental determinations were done according to STAS 1342-92: pH, azotates, total nitrogen, fixed residue, dissolved oxygen, oil products, sulphates, phosphates, chlorides, heavy metals.

The water of the River Jiu near the domestic wastes warehouse is in the second class of quality in most of its indicators except for NO_3^-, Cu and PO_4, which by the determined values, under classes it to the third quality class. Generally, the water from the River Jiu comes with a higher load of certain compounds. It is also noticed a very good oxygenation of the water near the wastes warehouse, corresponding to the first quality class.

***Keywords**: Jiu River, polluation, wastes, Tg – Jiu, levigat.*

One of the environment problems of the city of T Jiu from the Gorj County is the lack of valorization of the wastes that are un-appropriately managed and are disturbing the main environment factors. Un-recovered wastes are generally stored and each step in their management could be a potential risk for the environment. Mining, energetic industry, agriculture and domestic activities are important sources for wastes generation quantitatively, as well as from the point of view of the impact on the environment. The domestic wastes dump of the city of Tg Jiu is placed outside the city, on the right shore of the Jiu River. The main pollution source for the water is the levigat resulting from the percolation of the wastes dump towards the waters coming from precipitations.

The levigat quality resulted following the functioning of a wastes' storage house is dependant on:

- the area weather conditions where the warehouse is placed (the quantity and distribution of the precipitations, the thermal regime and the evapo-perspiration);
- the active surface of the warehouse;
- composition and quantity of the stored wastes;
- the age of the warehouse.

According to this model, the levigat volume generated on the surface unit is:

$$V = S_d \bullet \left(C_p - E_t \bullet c\right)$$

where:

V – the volume resulted on the surface unit in the time unit;

S – the active surface of the warehouse;

C_p – the precipitations quantity in the placement area;

E_t – evapo-perspiration.

The specialty literature indicates three categories of pollutants present in the levigat, namely:

- conventional pollutants: the oxygen consumption, the total content of dissolve salts, alkalinity, hardness;
- toxic pollutants:
- heavy metals: Pb, Cd, Hg, Cu etc.;
- organic pollutants; solvents, vinyl chloride;
- unconventional pollutants (95% of the organic pollutants from the levigat), toxic and dangerous substances. [1]

In the paper it is presented the pollution level with metals and organic compounds of the surface water in the neighborhood of the domestic wastes warehouse belonging to the city of Tg-Jiu.

MATERIAL AND METHOD

In order to investigate the water quality, there were taken two surface water samples from the river Jiu. Until this moment, the monitoring drillings execution was not completed; this is why the underground water samples could not be taken and analyzed as well. The experimental determinations were done according to STAS 1342-92: pH, azotates, total nitrogen, fixed residue, dissolved oxygen, oil products, sulphates, phosphates, chlorides, heavy metals.[4]

RESULTS AND DISCUSSIONS

In Table 1 are presented the experimental determinations made for the samples of the two sampling points which had as purpose the study of the potential pollution level with metals and organic compounds of the river Jiu in the neighboring area of the domestic wastes warehouse belonging tot the city of Tg Jiu.

Table 1

Quality indicators of the River Jiu

No.	Quality Indicator	M.U	Analyzed values		Admitted values	
			P1 - upstream	P2 - downstream	Order 1146/2002 (mg/L)	NTPA 001/2002 (mg/L)
1.	pH	-	7.21	7.29	6.5 – 8.5	6.5 - 9
2.	NO_3	mg/L	3.8	3.8	3	25 (37)
3.	NO_2	mg/L	0.20	0.20	0.06	1 (2)
4.	SO_4^{2-}	mg/L	0	0	150	600
5.	NH_4	mg/L	0.13	0.13	0.3	2 (3)
6.	PO_4	mg/L	0.37	0.10	0.1	-
7.	Cl	mg/L	7.1	7.1	100	500
8.	Fixed residue	mg/L	186	183	500	2000
9.	Total N	mg/L	1.01	1.04	4	10 (15)
10.	Dissolved oxygen	mg/L	8.95	8.75	Min.6	-
11.	Oil products	mg/L	0	0	0,1	5
12.	CCO-Mn	µg$KMnO_4$ 00.1 N	7.6	10.7	5-10	-
13.	CCO-Cr	µg/L	2.2	2.2	10-25	70 (125)
15.	Cu	µg/L	146	43	20	0.1
16.	Cd	µg/L	0	0	1	0.2
17.	Cr	µg/L	0	0	50	1
18.	Fe	µg/L	0.107	0.019	0.1	5
19.	Mg	µg/L	4.980	5.050	25	100
20.	Mn	µg/L	0.03	0	0.05	1
21.	Zn	µg/L	0	0	100	0.5
22.	Ni	µg/L	0	0	50	0.5
23.	Pb	µg/L	0	0	1	0.2

According to the determined values, it is noticed the agreement with all the maximum allowed limits according to NTPA 001/2002 „Used waters overflown in natural receptors" for all indicators.[2]

As compared to the already established values by the Order No. 1146/2002, the water of the River Jiu near the domestic wastes warehouse is in the second class of quality in most of its indicators except for NO_2, Cu and PO_4 which, by the determined values, under-classes it to the third quality class.[3] Generally, the water from the river Jiu comes with a higher load of certain compounds. It is also noticed a very good oxygenation of the water near the wastes warehouse, corresponding to the first quality class.

CONCLUSIONS

The experimentally determined values indicate an insignificant impact on the river Jiu. The evaluation of the pollution levels, the location of the dump and the surrounding areas was done based on the following:

- the technical analysis of environment aspects;
- investigations on the location;
- regulations, methodological norms an valid standards regarding the maximum allowed values for the pollutant concentrations in the environment and in the speciality literature.

BIBLIOGRAPHY

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4. STAS 1342 - 92 Potable water