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Study of Wastewater mixing in Sewage System and Wastewater Treatment in Slobozia

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Abstract

The new building system can't be concept without sewage system. In this paper analysed the capacity of sewage system and treatment plant after mixing different wastewater in Slobozia sewage system. Was analyzed the technical characteristics of systems, inconvenient of pump station incapacity, biological treatment. With specific algorithms was solved the wastewater distribution flow problems.

Keywords: *sewage systems, wastewater treatment, wastewater indicator.*

Introduction

The economic activities and population number increase significantly in Slobozia city. The important wastewater quantity contained a wide variety of contaminants [1]. Was produced change in sewage systems like flow wastewater, pressure fluctuation, different wastewater composition, biological treatment improperly. The wastewater plant from Slobozia has a 750 l/s capacity.

Experimental

The experimental study has two steps:

1. Established wastewater quality by sample every day, one month. In paper was presented only medium value. The sample was tacked from end point sewage systems.
2. Established surface water quality by sample two times per day during one month, every day.

The wastewater quality was appreciated with indicators presented in table 1. The samples collected respect SR-ISO 5667. All the analyses were done in laboratory and respected standard analysis [4, 5].

Table 1. Wastewater quality

Sample	NH4, mg/l	Extractible compounds, mg/l	BOD,mg/l
1	40.564	83.354	386.55
2	41.799	108.516	377.2
3	101.174	60.745	273.966
4	32.975	73.241	335.785
5	46.132	84.641	324.244
6	92.77	78.208	330.5
7	37.19	83.33	428.772
8	109.328	185.333	456.422
9	109.328	185.333	456.422
10	109.338	185.333	456.422
11	43.549	34.2	488.88
12	782.525	527.167	2581.8
13	130.933	115.158	487.157
14	220.46	118.54	420.56
15	224.93	120.14	280.56
16	100.55	55.26	280.65
17	120.14	88.44	410.56
18	88.96	220.14	320.56
19	99.55	99.44	230.56
20	65.42	226.99	280.87
21	43.56	440.51	260.58
22	75.69	115.44	253.89
23	77.98	218.32	376.57
24	96.54	330.14	397.23
25	99.66	320.44	253.96
26	63.82	208.56	335.99
27	111.46	209.14	324.95
28	665.44	223.66	320.58
29	84.66	332.51	425.44
30	96.95	308.44	466.53
31	66.32	310.52	356. 22

Because the capacity of sewage system is lower than normally and in wastewater treatment plant doesn't work biological stage, the Ialomita river quality showed by BOD in principal was affected (fig.1)

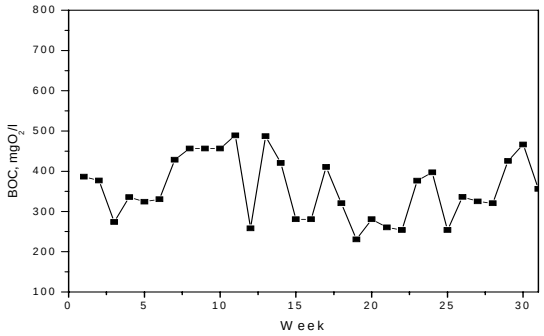

Fig 1. BOD –Ialomita river

Results and discussion

For the Slobozia sewage system was analyzed capacity with modern algorithms. Those algorithms are based to the section methods. That methods cut system in many sections, and the capacity of cut pipes is compared to the downstream demand. The curved who cut line is necessary to intercept the flow (figure 2)[2]. Was calculated the hydraulic gradient and difference between the required and the existing capacity. The results indicate available 190.24 m^3/d and necessary 240.44 m^3/d.

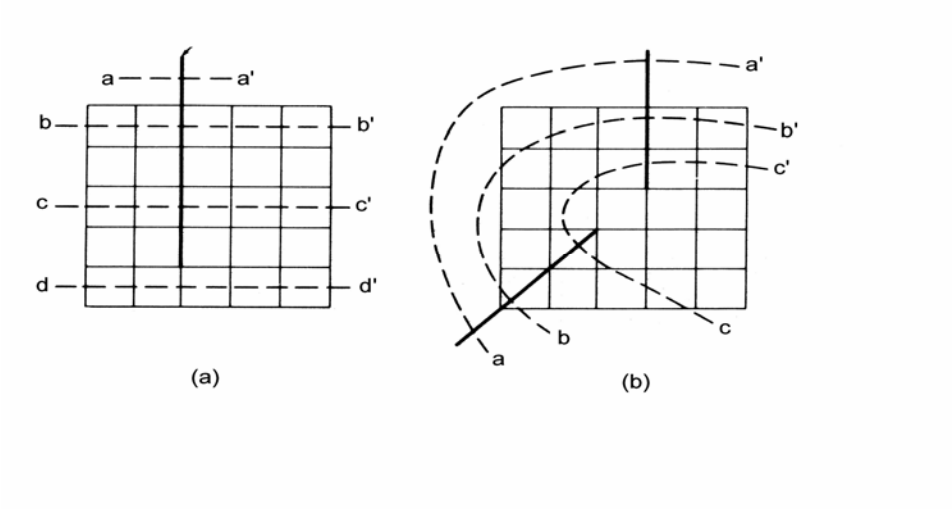

Fig. 2.Sections method [2,3]

Available hydraulic gradient was calculated with equation (1):

$$s = \frac{\frac{P_1}{A} - \frac{P_2}{A}}{L} \qquad (1)$$

where: P_1 represent pressure in start distribution system point, Pa;

P_2, minimum pressure required in end distribution system point, Pa;

L, length of main pipe system; A, 9810 N/m^3.

Table 2. Hydraulic gradient

P_1, Pa	P_2, Pa	L, m	s, m/m
$420*10^3$	$180*10^3$	10020	0.0024

Conclusions

This study noted that certain indicators of quality were recorded sometimes higher values than the exit at the entrance of the cleaning station. These results indicate a poor aeration and lower capacity of sewage system; don't have conditions unfolding in optimal conditions aerobes biological processes of oxidation and synthesis. In normal condition is necessary to re-evaluate wastewater system, sewage and treatment, and take properly decision.

References

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Studiul amestecării apelor uzate în sistemul de canalizare şi epurarea acestora în Slobozia

Rezumat

Noile construcţii nu pot fi concepute fara sisteme de canalizare. In aceasta lucrare se analizeaza capacitatea sistemului de canalizare existent si epurarea apelor uzate dupa amestecarea diferitelor tipuri de ape uzate in sistemul de canalizare al orasului Slobozia. Au fost analizate caracteristicile tehnice ale sistemului, inconvenientele statiei de pompare existente referitoare la incapacitatea acestora şi epurarea biologica. Cu algoritmi specifici s-a rezolvat problema distributiei volumelor de ape uzate in sistem.