

MONITORING USED WATERS IN MATASARI LOCALITY

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ABSTRACT. The paper describes the results of water quality monitoring at the Mătăsari wastewater treatment plant and Jilţ River. To establish the quality class of Jilţ river have been realized physical – chemical analyses for the following quality indicators: pH, substances in suspension, fix residues, chemical oxygen consumption, oxygen chemical consumption, ammoniac azoth, nitrates and chloride.

МОНИТОРИНГ НА КАЧЕСТВОТО НА ВОДИТЕ В ПРЕЧИСТВАТЕЛНА СТАНЦИЯ" МАТАСАРИ"

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РЕЗЮМЕ. Статията описва резултатите от мониторинг на водите в пречиствателна станция" Матасари" и р. Жиу. За да се установи качеството на водите, са извършени физико- химични анализи на някои качествени индикатори, по- важните от които са: рН, утайки, химична консумация на кислород, нитрати, хлорид и т.н.

Introduction

Water purification represents the ensemble of measures and procedures through which the impurities of chemical or bacteriological nature, contained in the used waters are reduced under certain limits so that these waters should not affect the receiver in which are exhausted.

Preventing pollution is realized especially through measures of supervision and control and fighting against pollution is realized through the agency of decontamination techniques (grills, desanders, decanters, etc).

The wastewater treatment plant of residual waters from Mătăsari locality has into their composition several parts, namely:

- pumping station;
- fix grills;
- desander,
- aeration basin,
- secondary decanter (Antoniou, R and collaborators, 1983).

Pollutants monitoring

To accentuate if residual waters are framed into the norms specified by the legislation in force, as well as the modality in which these waters influence the water quality of the emissary, have been sampled tests and realized physical – chemical analyses from 3 different points:

- Exhaustion waste water treatment plant

- Jilţ river (upstream exhaustion waste waters)
- Jilţ river (downstream exhaustion waste waters)

A series of chemical indicators, specific for the contamination of household nature, have been analyzed. Regarding the indicators analyzed for water exhausted from the waste water treatment plant, the interpretation of the results was realized according to the provisions of the NTPA 001/2002 Normative, regarding the assessment of the limits of loading with pollutants of the industrial and urban waste waters at the exhaustion in the natural receptors.

For the indicators analyzed from water of Jilţ River in the two sampling sections, interpretation was made according to the provisions of the Order of Ministry of Environment and Water Management regarding the classification of surface water quality, in order to establish the ecological status of water streams.

Results and discussions

Based on the results obtained for the analyzed indicators, can be realized some conclusions. The values of the analyzed indicators, regarding exhausted water from the waste water treatment plant are presented this way:

- the pH of the exhausted water presents values as part of the limits admitted by the Normative regarding the exhaustion of urban residual waters in the natural receivers
- for the indicator suspension substances, NTPA 001/2002 foresees an exhaustion limit of 35 mg/l. The analyze of the measurements results indicates the fact that during June and November, this limit has

been exceeded, in the first case, the value obtained being of 1.2 times over the admitted limit, and in the second case of 1.31 times (fig.1).

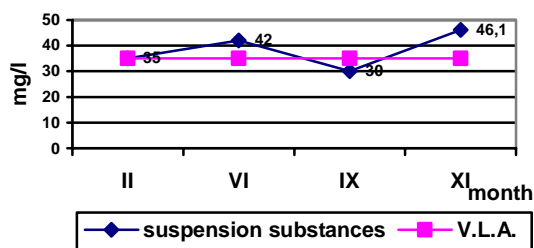


Fig.1. Variation of the concentration of suspension substance

- fix sediment. Values obtained for this indicator are much under the limits admitted by the normative in force. These represented between 5.75% and 14.1 % from the limit admitted value.
- Biochemical consumption of oxygen at 5 days, indicates the degree of lcharging water with biodegradable organic substances. Even in this case, the values obtained are situated under the admitted limit. These values have been 4.0 times smaller in September and 3.2 time in November (fig. 2).

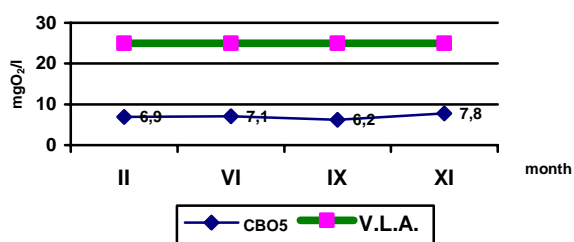


Fig.2. Variation of the CBO₅ concentration

- Oxygen chemical consumption (CCO_{Mn}). Even if NTPA 001/2002 does not present a limit concentration for this indicator, the measures values indicate a low degree of charging water with organic substances. The chemical consumption of oxygen, together with the biochemical consumption of oxygen, expresses the concentration of organic substances contained in the used water. From the residual waters biological treatability point of view, the rapport CBO₅/CCO is important. The values of the CBO₅/CCO <0,4 rapport indicates waters with high content of organic substances, difficultly biodegradable. In the present case, this rapport was contained between 0.82 and 0.91.
- Ammoniac azoth. For this indicator NTPA 001/2002 foresees a limit admitted concentration at the exhaustion in the emissary of 2.0mg/l. The highest value for the ammoniac azoth was registered in month June (1.2mg/l). This increase might be correlated with the fact that under the influence of the increased periods from this period takes place an intensification of the organic substance decomposition processes, but also a defective functionality of the purification biological stage [2].
- Nitrates (N-NO₃). Nor at this indicator the values obtained does not exceed the limit value, admitted by NTPA 001/2002 (fig. 3).

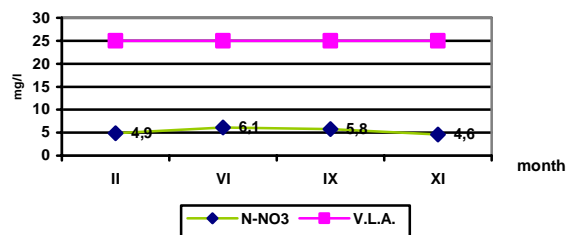


Fig.3. Variation of the N-NO₃ concentration

Its presence in higher concentrations in comparison with the ones of the ammoniac azoth indicates the fact that in the biological or secondary stage, represented by the aeration basin, under the influence of the oxygen contribution, takes place the oxidation of the ammoniac at nitrites which are oxidized further to nitrates. Nitrates are not toxic for humans or animals, from where their limits in deep waters. They become toxic in the moment when, reached in the organism, under the influence of reducing micro flora, can be reduced to nitrites, which are toxic.

- Chloride. The values of the concentrations which are measured for this indicator are positioned under the admitted limit, being 12.6 times, namely 14.7 times smaller than this.

In Jilț river, except for the residual waters from the waste water treatment plant of the Mătăsari localituy, are exhausted residual waters from the administrative headquarters of the two lignite quarries in the area. Residual waters from the administrative headquarter of these two quarries do not have a continuous debit and are passed through a preparation installation, formed from a decanter.

To underline the influence of these used waters on the quality of Jilț river water, have been sampled tests and realized physical - chemical analyses from two sections, one positioned upstream and one in downstream from this exhaustion.

The results interpretation, according to Order M.M.G.A., no. 161/2006 for the approval of the Normative regarding the classification of surface waters to establish the ecological status of the water bodies. [3]

Analyzing the results obtained in the two sampling sections, in the two sampling sections can be observed that in the upstream section of residual waters, for the NO₃ indicator, this is registered in the second class of quality (fig.4).

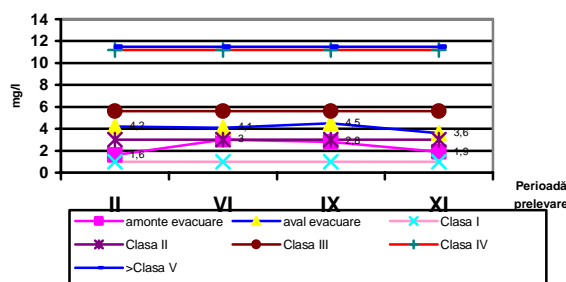


Fig.4. Variation of the NO₃ concentration in Jilț River

The analyzed water in the downstream section of the exhaustion of the waste water treatment plant, as last exhaustion point of the waste water treatment plant in Mătășari area, water corresponds to the third quality class, for ammoniac azoth as well as for nitrates.

Conclusions

- Biological treatability of household waste water is given by the rapport CBO5/CCO. Values smaller than 0.4 of this rapport indicates waste waters having an increased content of organic water, hardly biodegradable.
- Among the indicators measured at the exhaustion of waste waters, after their passage through the waste water treatment plant, have not been registered exceeding but at total substances in suspension.
- The other analyzed indicators have been registered in the limits foreseen by NTPA 001/2002 indicator, regarding the exhaustion of used waters in the surface waters.

Recommended for publication by Editorial board

- Jiț River in the downstream section of exhaustion of waste waters is positioned in the second quality category, the chemical indicators with specific values being the same with the ones indicating a defective functionality of the biological stage of the waste water treatment plant.

Bibliography

Antoniou, R and collaborators, 1983 *Purification of industrial waste waters*, Technical Publishing House, Bucharest, p. 138

The NTPA 001/2002 Normative regarding the establishment of the limits for charging with pollutants the waste industrial and urban waters at the exhaustion in the natural receptors.

Order M.M.G.A. no. 161/2006 for the approval of the Normative regarding the classification of surface waters to establish the ecological status of the water bodies.