MANAGEMENT OF WATER QUALITY MONITORING IN THE WESTERN REGION OF ROMANIA

MAMAGEMENTUL MONITORIZĂRII CALITĂȚII APELOR ÎN REGIUNEA DE VEST A ȚĂRII

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Abstract: *The role and importance of water in the movement and ecological balance is reflected in the biogenesis, resulting in water quantity and quality structure. Water pollution is the alteration of normal physical, chemical, biological and bacteriological, after which is inappropriate and harmful for population, vegetation and soil use. Overall, water pollution is caused by three major groups of agents: biological, chemical and physical. This is usually the result of human influences, and foatre rarely the result of natural phenomena.*

Key words: *water, environment, econimic prosperity, green energy*

INTRODUCTION

In many industrial installations resulting wastewater to be purified before being reintroduced into the natural cycles. The problem of such waste water purification or waste is not simple, because these waters contain various pollutants, solid, liquid or gaseous, dissolved or not in different concentrations, pollutants that can interact with each other, and may produce synergistic effects. Your treatment plants are placed end process technology, it works most times continuously and purification costs add up the costs of production, thereby increasing product cost.

Therefore, the correct choice of a technological process as simple as removes pollutants below maximum allowable concentration standards, with low consumption of reagents and energy, with recovery (where possible) of

valuable substances, should be primary concern who are concerned about industrial wastewater. If the concentrations of pollutants in wastewater are reduced, they can empty into urban sewer network, following their treatment to that station out of the city sewage plant.

MATERIALS AND METHODS

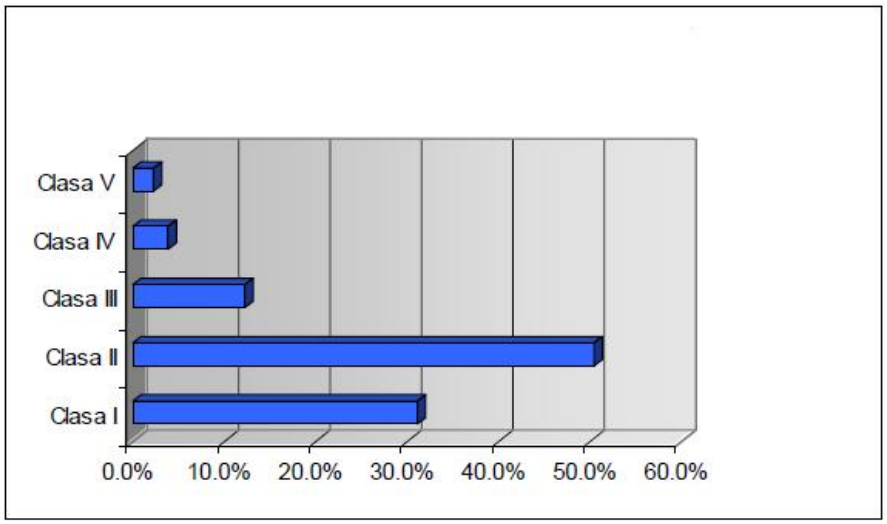
Water quality monitoring system, through standardized measurements and observations continue long term, implemented and managed the Western Region of Banat Water Directorate Timisoara, Targu Mures Water Department, Water Department and the Department of Oradea Craiova Water Integrated Monitoring System of National Water Quality (SNMCA) and aims: knowledge and assessment of water quality, assessing the status and trend of development of resources for development decisions in the management of water quantity and quality.

Further important issues are dealt with regarding the quality of the following components: surface water, groundwater, water resources potential, but also sewage and waste.

RESULTS AND DISCUSSIONS

Surface water quality

Mures Crişul White, Black Crişul, Jiu, Bega-Timis-Caras, the Nera-Cerna, Danube. In the West, of the total 2082 km of river basin belonging Mures Crişul White, Bega-Timis-Caras, the Nera-Cerna, in terms of quality grading in classes, the situation is as follows:
Quality Class I - 648 Km
Quality Class II - 1053 Km
Quality Class III - 256 Km
Quality Quality IV - 80 Km
Quality Class V - 45 Km



Graphic no. 1 Distribution of quality grades on the rivers of Western Region
Source: Regional Environmental Action Plan 2006-2013

In general, the upper courses of rivers covered in class I quality. The middle and lower classes, interest rates for the economy and the environment, river quality changes passing grade III of quality. In the West, the largest share is held by sections of rivers that fall into Class II quality, while quality grade, corresponding to very degraded river sections, the lowest percentage recorded.

West Lakes Region have been grouped by river basins and global employment are as mesotrophic. Trophic status of lakes in the catchment Bega-Timis-Caras and Nera-Cerna are shown in the tables below. Trophic status of lakes refers to the nutrients contained in water. Thus, trophic status can be defined by the following terms: oligotrophic, mesotrophic, eutrophic and hypertrophic. An oligotrophic environment is characterized by low levels of nutrients at the levels mesotrophic environments, and the hypertrophic by excessive amounts of nutrients. Eutrophication of lakes is caused by increasing chemical nutrients in the ecosystem in general compounds containing nitrogen and phosphorus and is often the result of water pollution in lakes and municipal wastewater discharges.

Centralised trophic status of lakes in the Basin Bega – Timiş – Caraş

Table no. 1

NO. CRT.	NAME ACCUMULATION AND STREAM	CRITERIA (INDICATORS) FOR ESTABLISHMENT TROPHIC STATUS				Framing Global
		Oxygen dissolved / oxygen saturation	Biogenic substances		Biomass phytoplankton	
			N tot	**P tot**		
1.	Trei Ape r. Timiş	Oligotrophic	Oligotrophic	hypertrophic	mesotrophic	mesotrophic
2.	Gozna r. Bârzava	Oligotrophic	Oligotrophic	hypertrophic	mesotrophic	mesotrophic
3.	Poiana Mărului r. Bistra Mărului	Oligotrophic	Oligotrophic	hypertrophic	mesotrophic	mesotrophic
4.	Zerveşti r. Sebeş	Oligotrophic	Oligotrophic	hypertrophic	mesotrophic	mesotrophic
5.	Secu r. Bârzava	Oligotrophic	Oligotrophic	hypertrophic	mesotrophic	mesotrophic
6.	Buhui r. Buhui	Oligotrophic	Oligotrophic	hypertrophic	mesotrophic	mesotrophic
7.	Dognecea Mică	Oligotrophic	Oligotrophic	hypertrophic	mesotrophic	mesotrophic

Source: Regional Environmental Action Plan 2006-2013

Centralised trophic status of lakes in the Basin Nera – Cerna

Table no. 2

NO. CRT..	NAME ACCUMULATION AND STREAM	CRITERIA (INDICATORS) FOR ESTABLISHMENT TROPHIC STATUS				Framing Global
		Oxygen dissolved / oxygen saturation	Biogenic substances		Biomass phytoplankton	
			N tot	**P tot**		
1.	Tăria r. Tăria (Nera)	mesotrophic	mesotrophic	mesotrophic	mesotrophic	mesotrophic
2.	Valea lui Iovan r. Cerna	mesotrophic	mesotrophic	mesotrophic	mesotrophic	mesotrophic
3.	Herculane r. Cerna	mesotrophic	mesotrophic	mesotrophic	mesotrophic	mesotrophic

Source: Regional Environmental Action Plan 2006-2013

Groundwater Quality

For the monitoring of groundwater quality in the West Region, there is drilling in the order I and II, a component of national surveillance network. Add to this the monitoring wells located within range of phenomena of pollution sources of environmental pollution, and some wells located around the landfill

Groundwater quality monitoring network included in national surveillance is conducted by the Departments of Water in Targu Mures,

Timisoara, Oradea and Craiova. Monitoring wells to monitor the phenomena of pollution is made in specialized laboratories for Local Environmental Protection Agencies.

The most serious cases of pollution - critical areas - the aquifer, in excess of the maximum permitted in exceptional (according to STAS 1342/91), there are indicators: organic substances, ammonia, phosphates, nitrates, nitrites and phenols.

Degradation of quality of phreatic water layer is produced by:

 discharge of untreated or insufficiently treated wastewater and low-grade network equipment with sewage;

 sewage discharged to the complex livestock and poultry;

 deposits of sludge and garbage in undeveloped areas;

 Chemical fertilizers and pesticides on agricultural lands administered incorrectly.

Potential water resources

Water resources can be a limiting factor of economic development in an area especially if those resources are insufficient, needed to be in deficit.

Surface water reserve in the Western Region is 8,072,704 thousand m³ / year. This quantity is represented in most of the river Mures (6,345,043 thousand m³ / year), but being head of river basin and containing pollutants, only water is used in agriculture and industry.

Poor quality of raw water from surface sources, involves finding new water sources for drinking. It also requires upgrading of water distribution networks to ensure the quantity and quality of drinking water for the population.

And domestic wastewater

In the West wastewater is discharged as follows:

Table no. 3

Wastewater distribution in the Western Region

County	Wastewater Volume **(mil. m³)**	Share
Arad	16.1	2.6%
Caraş-Severin	40.1	6.5%
Hunedoara	496.8	81.1%
Timiş	59.3	9.7%
Regiunea Vest	612.2	100.0%

Sursa: Planul Regional de Acțiune pentru Mediu 2006-2013

CONCLUSSIONS

Because neutralizing carbonari and bicarbonates present in soil and alkaline water by the acid ions, reduce their quantity and capacity of surface soils and to counteract the effect of acid rain.

At country level, some policy actions necessary for the protection of the atmosphere, namely:

 decrease emissions of main pollutants (sulfur dioxide, nitrogen oxides, volatile organic substances, ammonia);

 reduction in emission limits, the discharges of pollutants into the atmosphere, based on the principle of "polluter pays"

 setting emission levels of greenhouse gases to allow the prevention of dangerous anthropogenic interference with the climate system.

Mapping the regional wastewater sources has the following characteristic elements: efficiency of treatment, quantity and toxicity of pollutants discharged pollutants. From this point of view is highlighted: inefficient urban treatment plant requires upgrading and refurbishment; Lack of wastewater treatment plants in some urban and rural; Wastewater pre-treatment of inefficient industrial activities.

REFERENCES

1. **ANGELESCU A., PONORAN 1., CIOBOTARU V.**, *Mediul ambient şi dezvoltarea durabilă,* Ed. A.S.E., Bucureşti 1999;
2. **DUMESCU F.**, *Evaluarea impactului asupra mediului,* Editura Risoprint, Cluj Napoca, 2006;
3. **HEINSOHN R., KABL R.**, *Sources and control of air pollution,* Editura Prentice Hali, New Jersey, 1999;
4. **HELD D.**, *Transformări globale,* Editura Polirom, Iaşi, 2004;
5. **LESTER BROWN** ş.a., *Probleme globale ale omenirii - Starea lumii,* Editura Tehnică, Bucureşti, 1996;
6. **VIŞAN S.** ş.a., *Mediul înconjurător, poluare şi protecţie,* Editura Economică, Bucureşti, 2000;
7. **OUG 195/2005** privind protecția mediului, aprobată prin L.265/2006, modificată şi completată prin OUG 114/2007 şi OUG 164/2008;