CONSIDERATIONS ON THE EVOLUTION OF THE ŞOMUZU MARE RIVER WATER QUALITY IN THE DOLHEŞTI MONITORING SECTION

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ABSTRACT. – Considerations On The Evolution Of The Şomuzu Mare River Water Quality In The Dolheşti Monitoring Section. The paper deals with changes in indicators of quality physical - chemical, selected to present the main environmental impact of existing pressures in the river Siret. The main sources of pollution in the Siret basin are ranked according to: the impact of the pollutant toxicity and the maximum permissible value set for the evacuated pollutants. The study looked at water quality monitoring Siret River and it's tributaries in different sections of the monitoring study period was from 2009 to 2010. Based on the monitoring indicators agreed levels, grade falls into water courses. For knowing the quality of water flowing from the Siret River Basin during the years 2009 and 2010 were collected from river water samples Şomuzu Mare Dolheşti city. The main sources of pollution in the catchment area have influenced the state of its river water quality. After analyzing the variation in quality indicators increased physical - chemical river water quality Şomuzu Mare Dolheşti monitoring section in 2010, decreased compared with 2009, due to nitrite indicator, inducing a weak class quality Şomuzu Mare River , falling in the fourth grade of quality. Objectives and guidelines for water management strategy of the Siret River Basin aimed at achieving good water quality status, as required by the WFD.

Keywords: monitoring, quality parameters, accidental pollution, pollution sources.

1. INTRODUCTION

The geographical areas with surface or subterranean mine exploitations present multiple risk factors on the environment. The co-working of negative natural factors – landslides, inundations, and earthquakes – with the artificial ones – especially, those due to the exploitation deficiencies- can trigger the initiation and maintaining of some destructive phenomena on the environment.

Depending on economic development in the river Siret have outlined major sources of water pollution. These sources of pollution have led in time to create major problems on water quality. Siret basin specific issues are: flooding, accidental pollution, pollution of repeated users and the eutrophic sectors.

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There is the situation of mine exploitations from the sterile burrow placed in the mountain areas. The oil exploitation through the extraction points and intermediary deposits placements, present a high risk for ecological disasters triggering.

The decantation from the flowing and used water treatment ponds from the ore preparation factories represents negative phenomena that can be transformed into ecological disasters.

Between 1993 - 2003 there were 184 pollution incidents, with a minimum of 10 pollution in 1996 and a maximum of 28 in 2001. of the total pollution accidents occurring in this period 46.2% were recorded Trotuş River and its tributaries, 26.1% were recorded on Bistriţa River and its tributaries, and 9.8% were registered on the Siret River [6].

The pollutants affecting streams in most cases were 51.2% and petroleum products 21.4% organic substances, the remaining 27.4% being represented by ammonium, ammonia, hydrogen sulfide, heavy metals, cyanides, detergents, phosphorus suspension, ash, urea [6].

2. BACKGROUND ON THE SIRET RIVER BASIN

Romanian Siret River Basin is a system of 1013 water-course, having a total length of 15,157 kilometers, which represents 19.2% of the total network length encoded in the country [12].

Siret River Basin is located in the east - north-east is the largest river basin in Romania. Siret River is the largest tributary of the Danube, with an annual average flow at the mouth, approx. 250 m3 / s and is the largest river basin in Romania. Siret River Basin has a total area of 44,811 km2 of which 42,890 km2 and 28,116 km2 in Romania in the administration of Directorate of Water Siret River Area as [6].

Siret River Basin, the river sections, the situation is as follows: total length of 4228 km monitored, 1499 km (35.5%) were classified as class I, 1658 km (39.2%) in class II , 681 km (16.1%) grade III, 172 km (4.1%) grade IV and 218 km (5.2%) in the fifth grade [12].

Evolution of water quality in rivers Siret basin, according to STAS 4706/1998 is shown in the table. Figure 1 and table 1, including years of monitoring from 1998 to 2002.

Table 1. ***Evolution of tow categories of water in the river Siret***

Quality class	Year (km River)				
	1998	**1999**	**2000**	**2001**	**2002**
I	1141	779	1063	1320	1515
II	521	846	658	309	206
III	59	96	-	60	-
Degraded	139	139	139	171	139
Total	1860	1860	1860	1860	1860

Compared to the total water courses coded 78,905 km, not taking into account the pollution due to natural background and considering the length of the watercourses have water quality unattended I ° II shows that 1.2% of total falls in class V, 2.4% in class fourth, 7.1% in grade III and 89.2% fall in class I and II.

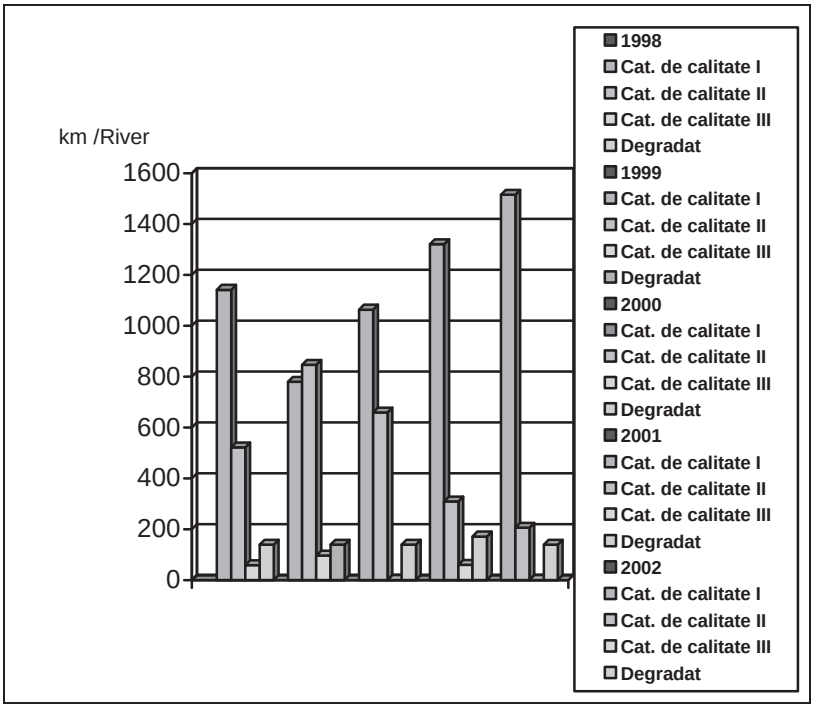

Fig. 1. ***Evolution of tow categories of water in the river Siret 1998 -2002***

3. POLLUTION ACCIDENTS OCCURRING ON THE RIVER ŞOMUZU MARE

Water is a natural source, renewable, vulnerable and limited, an important element for life and society, raw material for productive activities, Sure Energy, railway transport, important in maintaining ecological balance [5].

Great quality of the River was severely affected Şomuzu Mare in january and february 2001, following the accident recorded on deactivation platform METADET SA , Fălticeni profiled on the production of detergents.

The phenomenon of pollution recorded Şomuzu Mare River downstream of deactivation and the neighboring platform METADET SA, Siret River to the confluence with the Bistriţa River downstream of Bacau [7].

Given the dangerous toxic leak Şomuzulu Mare River, Siret River were large variations in the concentrations of cyanide and ammonia.

Contamination was caused by chemical waste landfill, located at the district Tarna Mare - Fălticeni ramp where they were in a state of conservation in 1988 four tanks of 250 tons of cyanide and three tanks with 200 tonnes of ammonia solution contaminated deactivation METADET SA Falticeni. The chemicals were stored in unsuitable conditions; the reservoirs are extremely worn [7].

Fig. 2. ***Fălticeni Platform - S.C. METADET S.A.***

By making large quantities of pipe stripping of pollutants (cyanide) have come into the River Siret, Şomuzu Mare and then, leading to fish mortality in people who ate fish poisoning infested, and human effort, materials and money to stop the phenomenon and mitigation.

Figure 3 presents the maximum values recorded of cyanide on the rivers Siret indicatoruli and Şomuzu Mare, from 18 to 27. 01. 2001, following the accident recorded on the platform METADET SA Fălticeni deactivation [7].

4. MONITORING THE STATUS OF WATER QUALITY PARAMETERS ŞOMUZU MARE RIVER, IN SECTIONS MEASURING DOLHEŞTI 2009 – 2010

Between 2009 - 2010 was made an assessment of river water quality Şomuzu Mare Dolheşti section by conducting surveys and measurements of general water quality parameters. Samples were collected to determine the pollutant concentration in Dolheşti section, represented by ammonium nitrogen,

nitrate, chloride, calcium sulfate, sodium, iron, suspensions, turbidity, detergents, and total nitrogen [11].

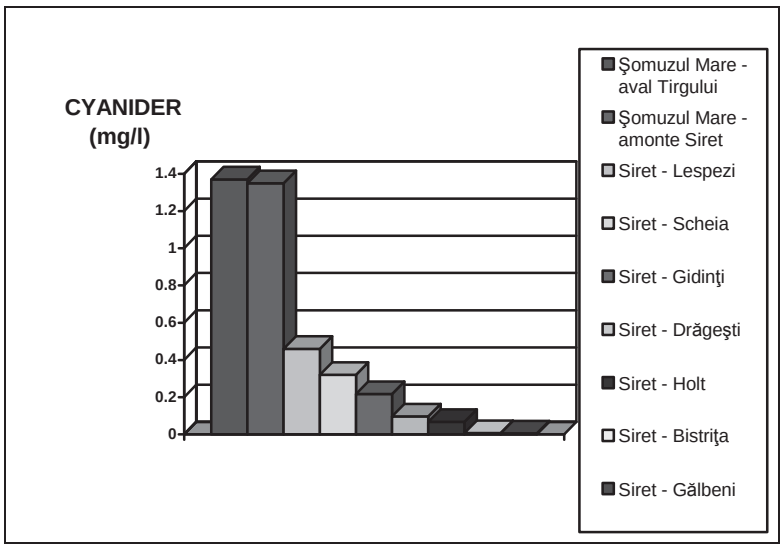

Fig. 3. ***The levels of cyanide in the river Siret River Great and Şomuzu Mare River from 18 - 27/01/2001***

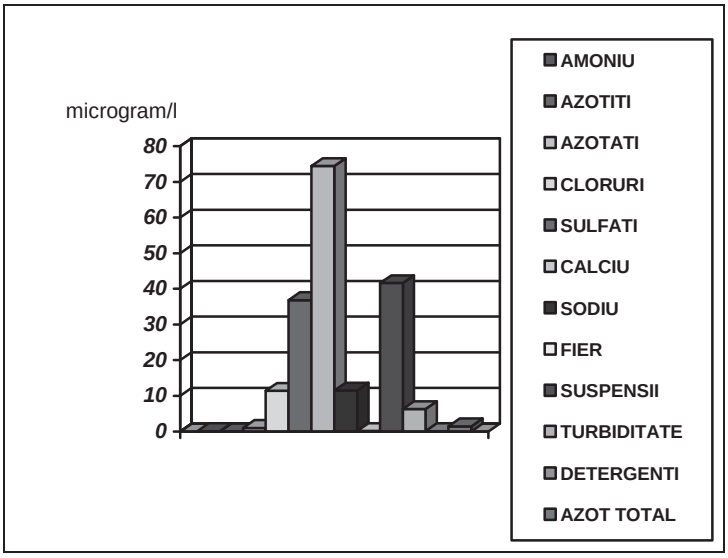

Fig. 4. ***Average concentrations of physical - chemical in 2009, Şomuzu Mare River section Dolheşti.***

Physical and chemical analysis conducted in 2009 for indicators: ammonium nitrogen, nitrate, chloride, calcium sulfate, and sodium, iron, suspensions, turbidity, detergents, total nitrogen were compared to relevant standards for each part [11].

In figure 4 are presented the indicators mean values for: ammonium nitrogen, nitrate, chloride, calcium sulfate, sodium, iron, suspensions, turbidity, detergents, total nitrogen, under the monitoring Dolheşti [11].

After analyzing the variation in quality indicators increased physical - chemical river water quality Şomuzu Mare Dolheşti monitoring section in 2009 is influenced by the presence of calcium ion, slightly exceeding the permissible limit, which frames the water quality class II [11]. In terms of iron ion quality Şomuzu Mare River water Monitoring Section Dolheşti fall in quality class III, the other class I parameters surrounding water quality.

After analyzing the variation in quality indicators increased physical - chemical river water quality Şomuzu Mare Dolheşti monitoring section in 2010, decreased compared with 2009, due to nitrite indicator, inducing a weak class quality Şomuzu Mare River , falling in the fourth grade of quality [11]. In terms of iron ion quality Şomuzu Mare River Water monitoring Section Dolheşti fall in the second class of quality.

In figure 5 are presented the indicators mean values for: ammonium nitrogen, nitrate, chloride, calcium sulfate, sodium, iron, suspensions, turbidity, detergents, total nitrogen, under the monitoring Dolheşti [11].

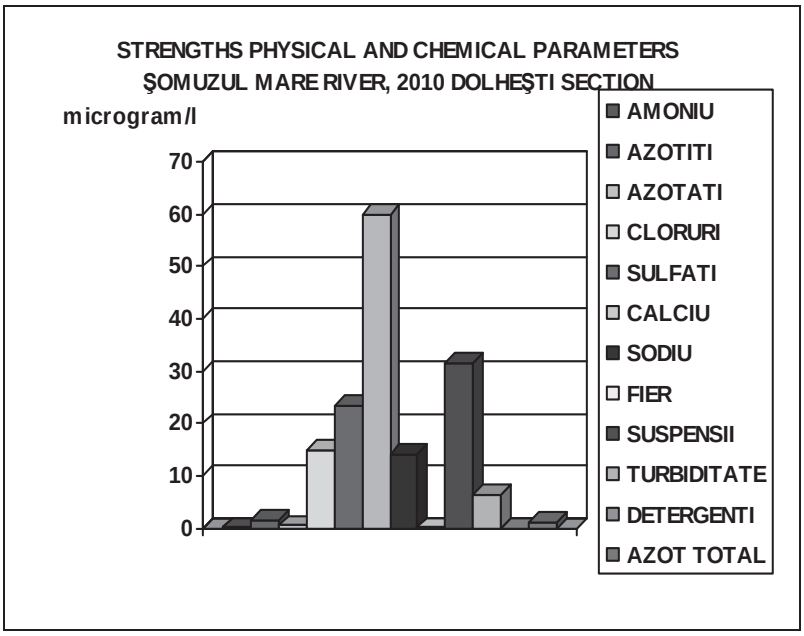

Fig. 5. ***Average concentrations of physical - chemical in 2010, Şomuzu Mare River section Dolheşti.***

5. CONCLUSIONS

Şomuzu Mare River has good water quality in the monitoring section Dolheşti, sporadic exceedances were recorded indicators, nitrates, total nitrogen, iron and calcium. Note that calcium indicator in one case leading to degradation of water quality to Class IV. Most times, they induce status as "very good" class I. The only thing to mention is that in certain situations, there is little value exceeded the calcium indicator, water moving from a state of "very good" state "good.

The central objective of the Water Framework Directive (Directive 2000/60/EC) is to achieve "good status" for all water bodies, both the surface and those of groundwater, except bodies and heavily modified artificial, which defines "good ecological potential."

Acknowledge

This works was supported by project POSDRU, CUANTUMDOC, ID 79407.

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