

CONSIDERATIONS REGARDING THE QUALITY INDICATORS OF INDUSTRIAL WASTE WATER FROM THE EXIT OF THE PRE-TREATMENT STATION

Florica Morar, Cosmin Petra

„Petru Maior” University of Tg. Mures
morar.florica@engineering.upm.ro, petracosmin@yahoo.com

ABSTRACT

Depending on the nature and concentration of substances pollutant effects of water pollution are complex and varied, therefore, requires the problems posed by water pollution, are carried out by treatment, thus ensuring the necessary conditions for consumption. The study is concerned the quality control of wastewater resulting from processes at a food drive profile. Since wastewater from milk processing impurities consisting mostly of components of whole milk or its derivatives is required, before being discharged into the drains of the city, they are passed through pre-treatment station, the unit meeting so EU recommendations on the existence and operation of wastewater pre-treatment plants, the technology for those units whose waters do not meet the quality indicators of sewage to be discharged into the drains of the city, to be conducted on the treatment plant. According to the survey could find that wastewater from milk processing units and in advance by pre-treatment station meet the quality indicators of technological wastewater pre-treated.

Keywords: industrial waste water, wastewater, water quality parameters of waste pre-treatment station, admitted and determined values of wastewater

1. Introduction

It is known that water is a central component of the living world and the environment simultaneously. Almost all molecules adopt a certain form, a certain arrangement, in response to chemical and physical properties of water. Also, water is actively participating in numerous chemical reactions that constitute life support. Reactants and products of metabolic reactions, nutrients, and residual by products depend on water to be transported within cells and between cells [1, 2].

In most countries in the world is used as drinking water from lakes or rivers and groundwater. As a rule, before the water is pumped into the distribution network, they must undergo purification in special facilities, in order to bring its quality up to standard. [4].

It is said that water is a central component of the ambient, as such, water is an important factor in the ecological balance and its pollution is a current problem with consequences more or less serious people.

Since areas of water use takes the different forms (water, water industry, water supply to agriculture, fisheries, urban and recreational purposes), its possibilities are very high pollution [1].

The effects of water pollution are complex and varied, depending on the nature and concentration of

pollutant substances. Solving these problems posed by water pollution is done by treatment, thus ensuring the necessary conditions for consumption [2].

Pollutants found in water as suspension or multi-component solutions fall into the following categories: organic, inorganic, biological waste, radioactive substances, petroleum products, pathogens, hot water.

The volume of industrial wastewater is generally 70% higher than municipal wastewater and loading and their harm is much greater. Currently, "range" of pollutants greatly diversified, industrial growth as a result of spectacular in decades [3].

Heavy pollution with organic compounds leads to imbalance of oxygen and is often accompanied by severe pathogenic contamination. Industrial wastewater can be discharged either drains or the receiver, of course when appropriate, after pre-treatment or prior treatment.

Small flows of industrial waste water are discharged, most often in urban sewer network, their treatment being made jointly with municipal wastewater. This solution, recommended for all literature can be applied only when industrial wastewater not degrade or impede the proper functioning of the sewerage network and treatment plant [7].

There are regulations governing how the evacuation prohibits the discharge of suspended matter, a quantity, size and nature are factors that can corrode aggressive sewers, which can cause deposits and clogging channels or hinder the normal flow of water through the channels [8].

If you cannot respect the limitations imposed by the regulations in force is necessary to treat these waters, in advance of pre-treatment facility called stations, within the enterprise, to arrest these substances and their use in manufacturing, as which the partially treated wastewater and can be discharged into the sewer system [8].

Thus, in most medium and large units of milk processing-unit subject of our study - there are stations industrial wastewater pre-treatment (as recommended by the EU).

Wastewater from milk processing

Contaminants in waste water consists mostly of components or derivatives of whole milk diluted in varying proportions and come either from washing vessels and installations, whether accidental or intentional discharge of sewage produced. The main components of milk and its derivatives are fats, proteins and carbohydrates.

Flow of wastewater from milk processing companies is not constant; usually wastewater is discharged in the first half of the day, between 7 and 14, but peak flow recorded at the end of processing, the cleaning equipment, tanks, ducts and rooms. Besides the daily variations of flow are recorded and seasonal (maximum in summer, may occur when the flow increases by about 30% of average). Parallel to flow fluctuations and fluctuations occur in the composition, so sometimes almost pure water is discharged at night.

Containing balanced proportions of microorganisms easily assimilated substances (proteins, fats and carbohydrates), wastewater from milk processing negatively affects the quality of surface waters are discharged by rapid oxygen consumption, the reports against dilution, and this is accompanied by the release of odours and deterioration of the appearance of the watercourse.

In terms of biochemical waste water from dairies occupies a special position, because they can move quickly through acid fermentation stage of their lactose content. In this process, lactose is converted into lactic acid, butyric acid, propionic acid and gases: carbon dioxide, hydrogen. Waste water becomes acidic, the pH decreased to below 3, where there is a precipitation of proteins. Fermentative processes are accelerated wastewater temperature (28 ... 35 ° C) [3].

S.C. SANLACTA S.A pre-treatment station.

For pre-treatment of wastewater from S.C. SANLACTA S.A. was necessary to install in 2008, the unit of flotation type SWL 10 (Figure 1).

From the characteristics of pre-treatment station we mention a few:

- Rated capacity-10mp/hour
- Noise level - 74.5 dB (in the recirculation pump) - 84.4 dB (the power);
- Wastewater temperature-5-300C;
- pH-level entry into the flotation units, 6-8;
- Solid particles in waste water at the entrance to the station, not more than 1mm;
- Station dimensions -3613x1373x1580mm;
- Nominal weight-750kg;
- Operational weight-2750kg.

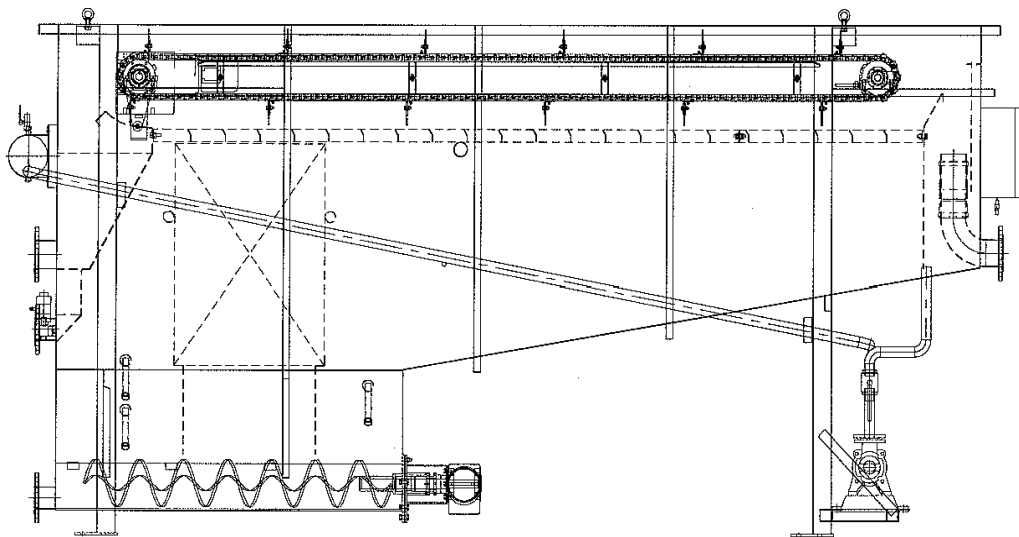


Fig.1. Flotation unit SWL 10

2. Experimental procedures

Mainly, waste water from the company resulting from processing milk sanitation facilities, the toilets and the car wash ramp.

Due to the specific unit, the wastewater must be treated first pre-treatment station to this unit.

Quality indicators of technological wastewater discharge pre treatment to the city sewer system must fall within the limits set out in Government no. 188/2002 (NTPA002) as amended or other limits imposed by the administrator of the sewage (Table 1).

Table 1.

Wastewater quality indicators of technological preepurate

Indicators	Values allowed	Monitoring Frequency	Observations
pH	6,5 – 8,5	momentary quarterly sample (4smp/year)	- Water sampling point: exit treatment plant - Sewerage network administrator has the right to change / Full list of quality indicators, their values and the frequency of monitoring
Total suspension	350 mg/l		
CBO ₅	300 mg/l		
CCOCr	500 mg/l		
Extractable	30 mg/l		
Total phosphorus	5 mg/l		

And technological waters from car wash pad, leaving the oil separator should have quality indicators as detailed in Table 2.

Table 2.

Quality indicators of technological wastewater from car washing pad

Indicators	Values allowed	Monitoring Frequency	Observations
pH	6,5 – 8,5	momentary quarterly sample (4smp/year)	- Water sampling point: exit treatment plant - sewerage network administrator has the right to change / Full list of quality indicators, their values and the frequency of monitoring
Total suspension	350 mg/l		
CCOCr	500 mg/l		
Extractable	30 mg/l		
Oil	5 mg/l		
Detergents	25 mg/l		

Waste water resulting from the execution processes SC SANLACTA SA, after being passed through the station pre-treatment unit are managed by the city's sewerage network, sludge and grease are collected in a pool, where they are taken regularly by AQUASERV, whose responsibility it is to treat them.

Quarterly LABQUACONSULT SRL evidence of water raises pre treatment, oil separator and the ramp washes, to do the necessary analysis.

Oil products are collected in separate barrels and taught specialized units for collection / neutralization.

3. Resultants and discussions

Following the data from the test reports issued SC Sanlacta SRL by Labquaconsult SRL I could do this study on water quality indicators have emerged from pre-treatment station and therefore undrinkable.

The data analyzed for the period 2009 - first quarter of this year are found in Tables 3 and 4.

Table 3.

Admitted indicators and determinants of wastewater pre-treatment out of the station in 2009-2011

N°	Indicators	UM	Values allowed	Average values determined			Method of analysis
				2009	2010	2011	
1	Materials in suspension	mg/l	350	67,2	97,1	124,0	STAS 6953/1981
2	Chemical oxygen (CCO-Cr)	mg/l	500	350,6	343,9	186,4	SR ISO 6060/1996
3	Biochemical oxygen (CBO ₅)	mg/l	300	164,7	140,9	74,8	SR EN 1899/2003
4	Hydrogen ion concentration (pH)	pH	6,5-8,5	6,79	7,06	7,0	SR ISO 10523/2001
5	Substances extractable with organic solvents	mg/l	30	4,31	6,57	7,6	SR 7587/1996
6	Total phosphorus	mg/l	5	1,6	1,71	1,4	SR 7277/1-1995

From Table 3 we see that was not exceeded at any of the accepted indicators determined.

The difference of values in 2011, the first three calculations reason is that milk made for processing

has the same composition throughout the year and the data are, as mentioned, only the first quarter of this year. Out of the oil separator, technological water

from car wash pad must have quality indicators as detailed in Table 4.

Table 4.

Indicators determined of preepurate water resulting from the oil separator and wash pad in 2009-2011

Nr. crt.	Indicators	UM	Average values determined			Method of analysis
			2009	2010	2011	
1	Materials in suspension	mg/l	402,6	226,5	184,0	STAS 6953/1981
2	Chemical oxygen (CCO-Cr)	mg/l	242,0	207,3	168,4	SR ISO 6060/1996
3	Hydrogen ion concentration (pH)	pH	6,82	7,07	7,1	SR ISO 10523/2001
4	Substances extractable with organic solvents	mg/l	48,0	16,7	10,2	SR 7587/1996
5	Oil	mg/l	traces <0,1			SR 7277/1-1995
6	Detergents	mg/l	7,4	3,0	1,8	SR ISO 7875/1-1996

Waste water resulting from wash pad is collected separately in oil separator, where they are taken by AQUASERV and sent for storage and treatment. There haven't been exceeded values determined indicators of wastewater from washing ramp. Therefore, to date, there hasn't been a situation that makes SC Sanlacta SRL to not eliminate water drains pre treatment in the city.

4. Conclusions

Following determinations are made by specialized companies, in order to establish quality indicators of wastewater resulting from the processing of milk have been found indicators excess of values provided by legislation. The indicators values, recorded oscillations from one quarter to another, depending on the characteristics of processed milk, which in turn depend on the general feeding of animals in those periods. Until now, there haven't been situations that make unable SC Sanlacta SRL to eliminate pretreated water drains in the city.

5. References

- [1] Bogdan Popa - *Gospodarirea apelor* - Editura tehnică, București, 2003;
- [2] Ciplea, L.I., Ciplea, Al. - *Poluarea mediului ambiant* - Editura tehnică, București, 1978;
- [3] Gavrilescu Elena, Gavrilescu B.F. - *Caracterul și proveniența apelor uzate și influența lor asupra emisarului*, Ed. SITECH, Craiova, 2009;
- [4] Lupea Alfa Xenia , Alina Gharibeh Branic, Ardelean A., Dorina Ardelean - *Fundamente de chimia mediului* - Ed. Didactica si Pedagogica, R.A., 2008;
- [5] Morar Florica- *Monitoring the quality of residual water resulted from the food industry* "Urban Planning and Environmental Protection Policies, 2010;
- [6] Negulescu, M. și colectivul - *Protecția mediului înconjurător* - Editura tehnică, București, 1995;
- [7] Negulescu, M. și colectivul - *Epurarea apelor industriale uzate* - Editura tehnică, București, 1968;
- [8] Rusu T., *Tehnologii și echipamente pentru tratarea și epurarea apelor*, U.T.PRESS, Cluj –Napoca,2008;
- [9] Library of SC SANLACTA S.A.
- [10] <http://www.unimed.ro>
- [11] <http://www.mrda.md>
- [12] <http://www.mediu.ro>.