

Characteristics of the physical and chemical parameters of water in pools of port in Świnoujście in 2009

Emil Cyraniak¹, Piotr Daniszewski^{2,*}, Beata Draszawka – Bołzan³

¹The Board of Marine Ports of Szczecin and Świnoujście S.A.,
Environment and Health Research Laboratory, 7 Bytomska Street, 70-603 Szczecin, Poland

²Department of Invertebrate Zoology and Limnology, University of Szczecin,
13 Wąska Street, 71-415 Szczecin, Poland

³Department of Chemistry and Protection of the Aquatic Environment, University of Szczecin,
3C Felczaka Street, 71-412 Szczecin, Poland

*E-mail address: daniszewski@univ.szczecin.pl

ABSTRACT

The aim of this work was to be traced during the summer and autumn of 2009 the level and dynamics of changes in the waters of the port the port Świnoujście general parameters pools water quality. In the work of the General indicators of water temperature, were numbered: pH, BOD₅, COD-Cr, Cl⁻. All the markings and the calculation was performed according to the methods recommended by Polish Standards, applying analytical procedures described in. by Dojlido, Elbanowską, Hermanowicz. Port of Świnoujście is a sea port located on the Gulf of Pomorską, on the southern coast of the Baltic Sea, on the islands of Usedom and Wolin. The Port is located at the Świna, in Świnoujście, West Pomeranian Voivodeship. The port can be placed on ships with a maximum length of 42.0 m and width 260,0 m, draught 12.8 m. The tides in the Harbor, but the water level fluctuations are possible with sudden currents entering and outgoing, which depending on the direction of prevailing winds and reaching speeds of up to 1.5 knots. At the entrance to the port at the West breakwater, It is Western. The primary function of the port of Świnoujście is the transshipment of cereals, ores, oil, paper, cellulose, general cargo, coal, iron. Trying to test water were collected by PN/C-04632.03 with a depth of about. 2 m below the water surface. The temperature at the place of sampling were numbered, pH. Collected water samples were fixed in accordance with the recommendations in the Polish Standard-PN/C-04632.04. Other indicators for the quality of the waters have been tagged within 24 hours from the moment of download attempts. The quality objectives was evaluated according to the criteria recommended to evaluate inland surface waters referred to in regulation of the Minister of the environment of 11 February 2004 on the classification for the present status of surface water and groundwater, how to conduct monitoring and how to interpret the results and presentation of these waters. Due to the exposure of the docks the port Świnoujście on the pollution associated with cross-what are the cereals, ores, oil, cellulose, carbon, iron, general research evaluation of the water quality of these pools, you can assess the status of water in order to keep these waters.

Key words: swimming pools port; natural water quality; pH; BOD₅; COD-Cr; Cl⁻

1. INTRODUCTION

The water framework directive imposes the obligation on all Member States of the European Union, to 2015 all water, including the waters of the port facilities, have a good ecological status [1, 3, 6-9, 12, 15, 16, 19-21].

Docks are among the areas, which are particularly vulnerable to water pollution in connection with cross-what may place on their site [4 -6, 8, 9, 11, 13, 16, 17, 20, 21, 24-29, 32, 33]. The primary function of the port of Świnoujście is the transshipment of cereals, ores, oil, paper, cellulose, general cargo, coal, iron [5, 6, 16, 17, 31, 33-40].

2. PART OF THE EXPERIMENTAL

Tests have been carried out in the 3 docks Port Świnoujście (Pools: Baltic, Atlantic and Western) during the summer and autumn of 2009. Port of Świnoujście is a sea port located on the Gulf of Pomorska, on the southern coast of the Baltic Sea, on the islands of Usedom and Wolin [5, 6, 16, 17, 33, 39, 40]. The Port is located at the Świna, in Świnoujście, West Pomeranian Voivodeship [33, 39, 40]. The port can be placed on ships with a maximum length of 42.0 m and width 260,0 m, draught 12.8 m [33, 39, 40].

The tides in the Harbor, but the water level fluctuations are possible with sudden currents entering and outgoing, which depending on the direction of prevailing winds and reaching speeds of up to 1.5 knots [5, 6, 16, 17, 33, 39, 40].

At the entrance to the port at the West breakwater, It is Western [5, 6, 16, 17, 33, 39, 40]. During the winter, the port is usually free of ice. Freezing docks and only after long periods of freezing weather occurs rarely [5, 6, 16, 17, 33, 39, 40]. On a map No 1 and 2 shows the location of the port of Świnoujście.

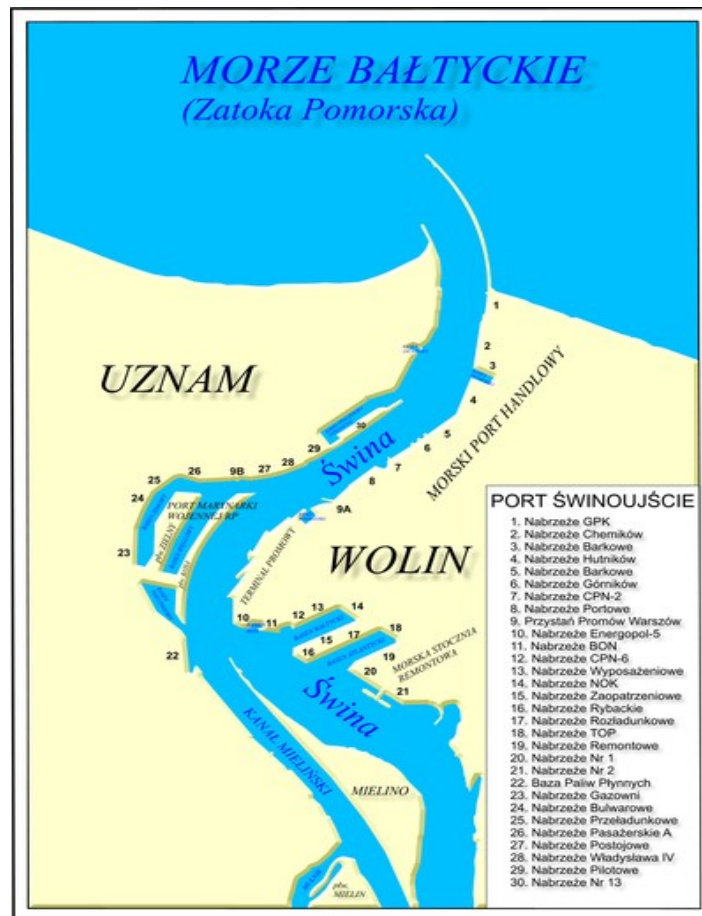


Map 1. Location of the port of Świnoujście. Source: The Sea in Szczecin



Map 2. Location of the port of Świnoujście. Source: The Sea in Szczecin

On a map No 3 shows the distribution channels and wharfs of the port of Świnoujście.



Map 3. Distribution channels and wharfs of the port of Świnoujście. Source: Port Szczecin-Świnoujście Board

Trying to test water were collected by PN/C-04632.03 with a depth of about 2 m below the water surface. The temperature at the place of sampling were numbered, pH. Collected water samples were fixed in accordance with the recommendations in the Polish Standard-PN/C-04632.04. Other indicators for the quality of the waters have been tagged within 24 hours from the moment of download attempts. In this work of physico-chemical indicators assessed waters marked concentration: BOD₅ in accordance with PN-EN 1899-2:2002, COD in accordance with PN-ISO 15705:2005, chloride in accordance with PN-ISO 9297:1994. The individual indicators of water quality was evaluated according to the criteria recommended to evaluate inland surface waters referred to in regulation of the Minister of the environment of 11 February 2004 on the classification for the present status of surface water and groundwater, how to conduct monitoring and how to interpret the results and presentation of these waters.

3. DISCUSSION OF THE RESULTS

The results of the quality of surface water docks the port Świnoujście during the summer and autumn of 2009 together with the test value indicators according to the classification criteria of the regulation of the Minister of the environment of 11 February 2004, are presented in tables 1 and 2.

Table 1. The results of the quality of surface water docks the port Świnoujście with the test value indicators according to the classification criteria of the regulation of the Minister of the environment of 11 February 2004, during the summer of 2009

The test pool	Water quality indices (units)			
	pH	BOD ₅ (mgO ₂ ·dm ⁻³)	COD-Cr (mgO ₂ ·dm ⁻³)	Cl ⁻ (mg Cl ⁻ ·dm ⁻³)
Atlantycki	8,38(I)	3,00(II)	22,00(III)	3215(V)
Bałtycki	8,48(I)	3,11(III)	26,50(III)	2741(V)
Trymerski	8,04(I)	2,55(II)	26,80(III)	3946(V)

Explanation: I, III, V - test indicator value according to the classification criteria of the regulation of the Minister of the environment of 11 February 2004.

Table 2. The results of the quality of surface water docks the port Świnoujście together with the test value indicators according to the classification criteria of the regulation of the Minister of the environment of 11 February 2004, during the autumn of 2009

The test pool	Water quality indices (units)			
	pH	BOD ₅ (mgO ₂ ·dm ⁻³)	COD-Cr (mgO ₂ ·dm ⁻³)	Cl ⁻ (mg Cl ⁻ ·dm ⁻³)
Atlantycki	8,06(I)	2,22(II)	20,10(III)	2222(V)
Bałtycki	8,06(I)	2,32(II)	26,00(III)	2296(V)
Trymerski	8,04(I)	1,94(I)	24,30(III)	2823(V)

Explanation: I, III, V - test indicator value according to the classification criteria of the regulation of the Minister of the environment of 11 February 2004.

Water pools in the port of Świnoujście port studies conducted have pH values were slightly alkaline-research have been included throughout the period and water quality class according to the criteria of the regulation of the Minister of the environment of 11 February 2004. Aquatic ecosystems studied pools tested the value of BOD₅ developed mainly at the level of the waters from the II to III class quality during the autumn of 2009, and during the years the value of this index was at the level I and II class water quality according to the criteria of the regulation of the Minister of the environment of 11 February 2004. The level of COD throughout the research developed at the level of the class III water quality. The concentration of chloride was at the level of the water quality criteria Regulation V class by the Minister of the environment of 11 February 2004.

Throughout the period of the test water docks the port Świnoujście had water quality assessment indicators of quality and class V class.

4. CONCLUSIONS

Due to the exposure of the docks the port Świnoujście on the pollution associated with cross-what are the cereals, ores, oil, cellulose, carbon, iron, general research evaluation of the water quality of these pools, you can assess the status of water in order to keep these waters.

POLISH STANDARD

PN/C-04632.03. General rules for sampling for the study of the physical, chemical and biological. Sampling technique.

PN/C-04632.04. General rules for sampling for the study of the physical, chemical and biological. Recording and storage of samples.

PN/C-06504. The preparation of buffer solutions.

PN-90/C-04540/01 – determination of pH.

PN-EN 1899-2:2002 – determination of BOD₅.

PN-ISO 15705:2005 – determination of COD.

PN-ISO 9297:1994 – determination of chlorides.

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