

Appendix 11.2 – Surface Water Quality



Report from physico-chemical analysis of surface water

Client:	GEING Krebs und Kiefer International & others Ltd, Boris Trajkovski No. 111, Skopje
Subject installation:	Surface water close to section Bukojchani – Kichevo, for the construction of route Gostivar - Kichevo
Report number:	030-B/19
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Date of issue:	20.02.2019

1. Introduction

On February 13th, Pharmachem - Environmental Laboratory took two samples of surface water from an open channel south of Strogomishte and Zajaska Reka.

2. Description of measurement points

Measurement point 1, MP1 – The surface water sample is collected from the channel south of village Strogomishte. The sample is taken at a location marked by the Client as Bridge 1, km2+874.08; L=20.0m. The measurement point coordinates are N 41°35'46" and E 20°57'56". The sample is collected around 1 PM.

Measurement point 2, MP2 – The sample is collected from Zajaska Reka, at a location marked by the Client as Bridge 2, km8+750.00; L=60.0m. The measurement point coordinates are N 41°32'41" and E 20°58'18". The sample is collected around 12 PM.



Figure 1. MP1



Figure 2. MP2



Figure 3. Satellite images with marked measurement points

3. Surface water sampling and analysis

The surface water sampling and transportation is performed in accordance with the MKC EN ISO 5667-6:2017 standard - Guidance on sampling of rivers and streams.

Subject of analysis in the surface water samples are the following parameters: fogginess, chemical consumption of oxygen and kalium bichromicum ($\text{COD}_{\text{K2Cr2O7}}$), biochemical consumption of oxygen for 5 days (BOD_5), nitrates, phosphates, dissolved oxygen, oxygen saturation, zinc, lead, total fat and grease and suspended material.

4. Results from the physico-chemical analysis of the surface water

The results from the performed physico-chemical analysis of the surface water samples are given in Table 1.

Table 1.

Measuring parameter	Method of determination	Unit	MP1	MP2
Fogginess	Photometrical, unaccredited	FAU	1	2
$\text{COD}_{\text{K2Cr2O7}}$	Merck Spectroquant COD Cell test 1.14541, analogous to ISO 15705:2002	mg/L O ₂	< 25	< 25
BOD_5	MKC EN 1899-1:2007, unaccredited	mg/L O ₂	1,9	1,3
Nitrates	Spectroquant NO ₃ -N test 1.09713; Analogous to DIN 38405 D9:2011	mg/L N	3,3 (± 0,3)	< 1,0
Phosphates	Spectroquant PO ₄ -P test 1.14848; Analogous to MKC ISO 6878:2013	mg/L P	< 0,05	< 0,05
Dissolved oxygen	MKC EN ISO 5814:2012, unaccredited	mg/L O ₂	9,6	9,5
Oxygen saturation	MKC EN ISO 5814:2012, unaccredited	%	102	102
Zinc	Merck 1.14832, unaccredited	mg/L Zn	< 0,05	< 0,05
Lead	Merck 1.09717, unaccredited	mg/L Pb	< 0,10	< 0,10
Total fat and grease	SM 5520, unaccredited	mg/L	< 2	< 2
Suspended material	MKC ISO 11923:2007	mg/L	4,0 (± 0,9)	3,0 (± 0,7)

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