WATER SAMPLING PROCESS AT CITY OF BATUMI CHAISUBANI WATER SUPPLY HEADWORK FROM SURFACE SOURCES AND CENTRALIZED WATER SUPPLY SYSTEM, Q UALITY RESEARCH AND EVALUATION OF RESULTS (FROM WATER SUPPLY SOURCE TO CUSTOMER)

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INTRODUCTION

LLC "Batumi Water"s Centralized water supply system supplied with both: surface water and groundwater. Surface water sources are following rivers: water of Chakvi; Koroli and its left tributary – river Lecha.

City Batumi Chaisubani's centralized water supply system consists with: water intake structures of the rivers Korolistkali and Lecha, water treatement plant of Chaisubani (headwork of Chaisubani), Repository reservoir of drinking water (Injalo, Salibauri and Todogauri).

To ensure safe, continuous and reliable supply of drinking water to customers from water supply of Chaisubani was conducted: Field, laboratory and cameral (office) works. Aim of this work was Water sampling process at city Batumi Chaisubani water supply headwork from surface sources and centralized water supply system, quality research and evaluation of results.

METHODOLOGY

Was reviewed existing literature, identified potential sources of pollution and studied normative documents in force in the country. A group of specialists involved in sampling was formed to carry out the planned work and developed water sampling plan from surface and centralized water supply systems, also from water catchement system. Surface and drinking water sampling points were selected for fieldwork. Water samples were taken in accordance with the requirements of the legislation[3]. The list of organoleptic, physico-chemical, microbiological and parasitological parameters to be tested in the surface source of water supply and drinking water of centralized water supply has been determined according to following normative documents: Resolution N 425 of the Government of Georgia of December 31, 2013; "Technical Regulation of Drinking Water". (Resolution N58 of the Government of Georgia of January 15, 2014) [1]. Research methods and quantities of samples required for the study were selected. Determined the parameters (temperature, pH, turbidity, dissolved oxygen, TDS, Residual Free Chlorine etc.) [4] measured at the time of sampling on the spot and a list of indicators which require sample pre-conservation with appropriate preservatives.

Containers meeting the requirements of ISO standards were prepared for water sampling.

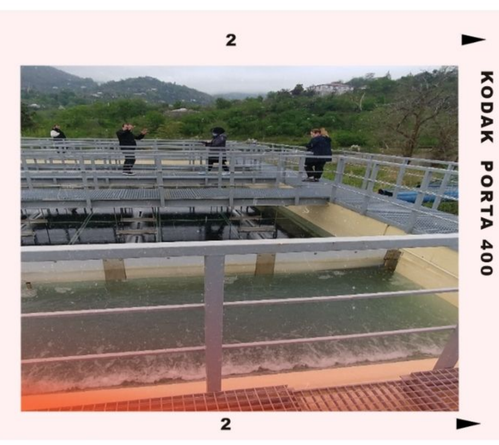
Portable tools were prepared prior to the start of the excavation work. The appropriates were calibrated on site before sampling.On the waterproof labels used for marking the bottles, the relevant information was entered (sample number, research parameter, date of sampling, etc.).

PROBLEMATIC ISSUES

Some sort of problematic issues arosed during the sampling:

1. The normative document (Technical Regulation (Resolution of the Government of Georgia No. 425 of December 31, 2013) provides for the taking of test water samples from the water supply source up to 100 meters upstream and 100 meters downstream. When taking water samples from a surface water supply source, this was not possible due to the geographical location (narrow valley, difficult terrain), which was mentioned in the water sampling act.[2];
2. Due to the changing climatic conditions of the city of Batumi, there was a sudden change in the weather, at the scheduled time of sampling was determined the turbidity of the water, because of high turbidity the field work was postponed until the improvement of the weather.
3. Two field brigades were involved in the study to ensure the timely transportation of microbiological samples. One was taking samples while the other was transporting the aforementioned.

CHAISUBANI WATER TREATMENT PLANT



PARAMETERS MEASURED DURING FIELD WORK IN THE WATER OF THE RIVER KOLOLISWKALI AND RIVER LECHA
TABLE 1

Parameter	Unit	Surface water from Chaisubani headworks	Surface water from Chaisubani headworks
pH	-	7.65	7.73
Turbidity	NTU	0.33	0.40
TDS	mg/l	68.19	60.32
Temperature	^{0}C	14	14

Laboratory test were provided at Ltd "Scientifical-Research Institute of Sanitary, Hygiene and Medical Ecology", Laboratory Research Center of the Ministry of Agriculture of the Autonomous Republic of Adjara and LLC "Batumi Water"-Chemical Micro-biological Laboratory.

During the field works, Korolistskali and Lecha rivers samples were taken from the Chaisubani headwork's water intake structures arranged on rivers. Water flows from the Chaisubani headworks to the water treatment plant, where it goes through the treatment stages. The treated drinking water from the Chaisubani headworks flows into the Injalo, Salibauri and Todogauri reservoirs, from where it is distributed to the city of Batumi through water supply network in different districts. Samples of drinking water entering and leaving the reservoirs were taken from the inlet and outlet pipes of the tanks installed on the reservoirs.

RESULTS AND DISCUSSION

The water of the river Korilistavi and Lecha, taken from the Chaisubani headwaters, belongs to the low mineralization. The surveyed indicators comply with the requirements of the "Technical Regulation on Protection of Surface Water Pollution of Georgia" approved by the Resolution N425 of the Government of Georgia of December 31, 2013. The treated drinking water entering and leaving the Chaisubani water supply reservoirs belongs to the soft mineralized, hydrocarbonate-calcium type soft water. The defined organoleptic, microbiological, physico-chemical, radiological and parasitological parameters comply with the requirements of the "Technical Regulation of Drinking Water".

PARAMETERS MEASURED DURING FIELD WORK IN THE CITY OF BATUMI CENTRALIZED WATER SUPPLY FROM THE CHAISUBANI
TABLE 2

Parameter	Unit	Treated water from Chaisubani headworks
pH	-	7.60
Turbidity	NTU	0.80
TDS	mg/l	91.83

DRINKING WATER ENTERING AND LEAVING TO THE SALIBAURI STORAGE RESERVOIR
TABLE 3

Parameter	Unit	Entering	Leaving
pH	-	7.61	7.79
Turbidity	NTU	0.52	0.71
TDS	mg/l	75.86	83.42

CONCLUSION

According to the research results, the study waters of the Korolistskali and Lecha rivers belong to the low mineralized waters. The impact of supply reservoirs on the quality of water leaving the reservoirs was not revealed. The quality of water from all storage reservoirs complies with the requirements of the "Technical Regulation of Drinking Water".

The water quality of City of Batumi Chaisubani water pipeline is harmless for the health of the population, complies with the established norms and ensures safe, uninterrupted and reliable supply of drinking water to consumers.

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