

Brief outline of the report: “Waste Water Quality Control”

Presented by Maria V. Pautova

Head of Department for Analysis and Control of Water Resources and Soil Pollution and Wastes under FSE “Center of Laboratory Analysis and Technical Metrology for Arkhangelsk Region”

## **Waste Water Quality Control**

### **Introduction**

Human activity poses a threat to water. By degrading the quality and reducing the amount of water resources, we endanger the safety of water supply. The main threat to water bodies is caused by municipal, industrial and agricultural waste waters, as well as by the overuse of water resources.

One of the major sources of water pollution (among the main pollutants are easily and hardy oxidizable substances, suspended matter, ammonium ions, phosphates, ammonium surface active agents) are housing and utility services organizations. The causes of environmental law violation boil down to inadequate condition of their technical facilities. Many purification installations today require major overhaul and rehabilitation. It is due to operating services' effort that these 40-50 year old facilities work to their designed capacity.

### **1. Production analytical control. Basic concepts**

Water quality control is a process of comparing water quality indices with the set norms and requirements.

The production analytical control over the pollutants discharged by industrial businesses into water bodies is based on the officially approved norms and standards required for production control performance; approved regulatory and procedural control guidelines; schemes of laboratory control over the efficiency of treatment facilities, waste water discharge and river water quality.

The waste water quality control, thus, includes:

- control of compliance with the set standards for discharge of pollutants into water bodies;
- control of efficiency of treatment facilities;
- control of the state of water bodies;
- control of pollutants discharge in emergency situations and clean-up.

Form-wise, the analytical control of waste water quality can be scheduled or unscheduled.

Purpose-wise, the analytical control is classified into operative and decade.

### **2. General information on the activities of CLATI (Center of Laboratory Analysis and Technical Metrology) for Arkhangelsk Region**

“Arkhangelsk Region CLATI”, a branch of FSE “Center of Laboratory Analysis and Technical Metrology for North-West Federal District of Russia”, is one of the leading laboratories in charge of water quality control. It has been duly accredited for technical competency and independence according to GOST R ISO/IEC 17025 standard. “Arkhangelsk Region CLATI” is also licensed by Federal Service for Hydrometeorology and Environmental Monitoring to perform environmental monitoring and associated activities.

### **3. Procedure of analytical control.**

The waste water quality control includes:

- waste water sampling;
- waste water quality control;
- processing of results.

The control results are used in

- development and implementation of measures to reduce the amount of pollutants discharged;
- adjustment of the operational mode of treatment facilities;
- development and implementation of measures to enhance the efficiency of treatment facilities and reduce the negative impact on the water body;
- completion of statistical reporting forms, charging fees for negative impact on the environment;
- development of regulatory and design documentation; issuing permits for discharge of pollutants.

**Thus, the qualitative description of waste waters is essential when selecting treatment method, controlling the operation of treatment facilities and waste water discharge, as well as when deciding whether it is possible to re-use wastes, extract and dispose of water pollutants.**

#### **4. Challenges in waste water quality control**

One of the major factors inhibiting the efficient water management is the ambiguity of quality coefficients selected.

How many water quality coefficients are standardized in Russia? The current system of norm-setting for pollutants maximum permissible discharges (MPD) requires all substances present in waste waters to be controlled. MPD will be calculated on the basis of pollutants maximum permissible concentrations (MPC). Drinking and recreational water bodies are monitored for over 1625 pollutants MPC; fishery bodies – for over 1204 substances.

How many pollutants can be found in waste waters? Annually, the world produces 400 million tons of various chemical compounds. They will sooner or later appear in waste waters and, consequently, enter surface water bodies.

One should recognize that the process of water quality control cannot cover the composition of all the pollutants present and that the actual fraction of substances determined is much higher and annually grows.

**The quality of waste waters environmental control can only be enhanced by using unified, group, integral indices, which can give us water status description (among the recommended integral indices are COD, suspended matter, total phosphorus, total nitrogen). Water toxicity, with further identification of toxic substances, must also be determined.**