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| Item No. | Name of Project | Introduction of the inductively coupled plasma atomic emission spectrometer (ICP-AES) into activities of the chemico-bacteriological laboratory of the Minskvodoprovod Production Facilities (chemico-bacteriological laboratory) |
| 1 | Term of implementation of the project | 2023 |
| 2 | Applicant organisation proposing the project | MINSKVODOKANAL UE |
| 3 | Objectives of the Project | Reducing the labour intensity of the process of determining a number of metals, improving the accuracy, reproducibility of test results, reducing the costs due to the possibility of determining the groups of indicators when performing the production control of underground, surface and drinking water in the city of Minsk |
| 4 | Tasks planned to be performed within the framework of the project implementation | 1. Purchase (hereinafter referred to as AES) for testing of drinking and natural water in Minsk for the determination of metals2. Introduction of the Inductively coupled plasma atomic emission spectrometer into the activities of the chemico-bacteriological laboratory  |
| 5 | Target groups | Minskvodoprovod Production Facilities |
| 6 | Brief description of the measures within the project | 1. Purchase of the AES2. Installation and set-up of the AES3. Introduction of the procedure for testing the water samples in the AES4. Training of the personnel |
| 7 | Total volume of financing | Approximately 168,000 US dollars |
| 8 | Source of financing | Volume of financing (in US dollars) |
|  | Donor’s funds | 168,000 US dollars |
|  | Co-financing | 1% for training the personnel that is 1,680 US dollars |
| 9 | Project implementation place (region/district, city) | City of Minsk |
| 10 | Contact person: Initials, surname, position, phone, e-mail address | N.K.Roman, head of the chemico-bacteriological laboratory of Minskvodoprovod Production Facilities+375 445857328himbaclabmvp@gmail.com |
| 11 | Justification  | The composition of natural and drinking water as well as water of the centralised water supply systems in Minsk is monitored by the chemico-bacteriological laboratory in accordance with the requirements of the Working Programs of the in-process control of natural and drinking water in the water intakes, Sokol Water Service Department and the distribution network of Minsk for the years 2021-2025 developed on the basis of the requirements of Sanitary Rules and Regulations 10-124 RB 99 and Hygienic Standard “Drinking water safety indicators” with the frequency established by the said regulatory documents. The quality of drinking and natural water as well as sources of drinking water supply is tested for the content of 19 heavy metals (zinc, copper, lead, aluminium, cadmium, nickel, beryllium, molybdenum, selenium, antimony, manganese, arsenic, mercury, etc.). They are present in water in dissolved forms of salts and to insignificant extent – in the form of poorly soluble oxides and hydroxides. The elements to be determined are present in a wide range of concentrations (from a few nanograms to milligrams per litre). Due to its capabilities, the AES allows determining metals even in trace amounts. At present, the determination of metals is performed in the chemico-bacteriological laboratory by various methods: photometry, atomic absorption spectrometry with thermal atomisation and using the capillary electrophoresis system. In so doing there is a number of negative disadvantages: high labour intensity of the process (constant monitoring of the boiling process during the photometric determination of manganese), as well as use of mercury-containing reagents in determination of manganese and, as a result, formation of laboratory drains containing mercury salts, the discharge of which into the sewer is not regulated by the legislation in force in the country.Acquisition of the AES will make it possible to:1. determine the water quality indicators in accordance with Sanitary Rules and Regulations and GN for determining metals to the full extent; eliminate the risks of non-fulfilment of the Working Programs in case of failure of the laboratory's equipment;
2. optimise the determination of arsenic, mercury, barium, strontium, manganese and iron in water intakes and wells;
3. exclude the use of mercury-containing reagents and, therefore, formation of laboratory drains containing mercury salts during the determination of manganese.
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| 12 | Results of implementation of the project | The AES will increase the productivity of the determination process, ensure the rational organisation of work, minimise the use of mercury-containing reagents and therefore formation of laboratory drains containing mercury salts; it will also remove the risks of non-fulfilment of the work programs for in-process control of underground, surface and drinking water for the needs of the city of Minsk. |