



Enhancing environmental radiation monitoring in Uzbekistan

The challenge

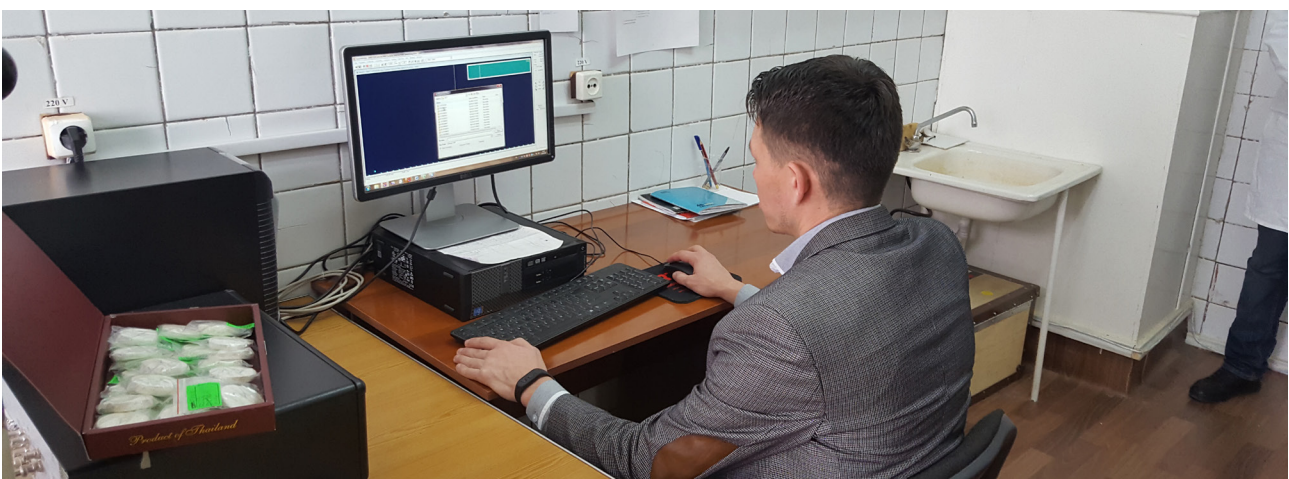
In Uzbekistan, the mining industry and uranium production legacy sites have the potential to significantly affect surrounding areas with radionuclides and potentially toxic elements associated with uranium production residues. The country had therefore in place a network of hydrological and meteorological observation stations, with many of them located within the affected areas. The central laboratory of UzHydromet, the Centre of Hydrometeorological Service, is tasked to conduct the environmental radioactivity monitoring activities in the country. It is a central point for collecting and analysing the data and samples from all national hydrological and meteorological observation stations. Although the UzHydromet laboratory received modern equipment under previous IAEA projects which allowed it to establish baseline monitoring of radioactivity in the environment, it still lacked some essential laboratory equipment for the analysis of alpha-emitting radionuclides, sampling and sample preparation. Uzbekistan needed to enhance the technical capabilities of the Uzhydromet observational network and to improve the analytical capacities of its laboratories in order to establish an adequate environmental radioactivity monitoring programme for the characterization and monitoring of the

environment and for minimizing the impact of radioactive mining residues on the population.

The project

The project was designed to improve technical and human capacities, as well as the quality of monitoring data collected through the environmental monitoring network. Uzhydromet laboratory staff were trained in Ukraine to conduct sampling and apply analytical techniques to measure radionuclides in soil, freshwater and bottom sediments. The laboratory staff also visited a laboratory in Belarus to learn more about modern techniques and equipment for environmental radioactivity analysis.

Alongside this training, the IAEA technical cooperation project provided Uzhydromet with equipment, further developing the analytical capacities of Uzbekistan's monitoring network. The newly-purchased sediment core sampler and water sampler, accompanied by necessary accessories and a freeze-drying system for solid sample processing (i.e. soil, sediment), increases laboratory capacity for sampling and monitoring of all environmental media (including soil, sediment and freshwater samples, which were not monitored before). This is particularly important because of the many observation stations located in areas



Analysing an air filter sample at Uzhydromet, Uzbekistan by gamma-ray spectrometry (Photo: Christoph Henrich, IAEA).

affected by the mining industry and in particular near uranium production legacy sites. An alpha spectrometric system was also purchased and installed, increasing the laboratory's capacity to measure alpha-emitting radionuclides at low level environmental concentrations. A portable air sampler allows the laboratory to perform regular and ad-hoc air monitoring at the country's borders and will also be useful in case of emergency situations. The level of radon (a natural radioactive gas in the uranium decay series) in dwellings, public buildings and environmental media such as soil and water in areas with enhanced uranium concentrations, can now be assessed with the new radon monitor.

These activities were accompanied by a series of expert missions to support the staff of the laboratory in using the new equipment and in applying new sampling and analytical techniques.

The impact

In 2017, the laboratory performed around 15 000 dose rate measurements, 1784 gamma measurements (air filters) and 55 alpha-beta spectrometric measurements (water samples). The new sampling and analytical equipment will increase the number of measurements to about 200 alpha spectrometric measurements/year and 500 gamma measurements/year, and will allow the monitoring of existing radioactivity levels in all environmental media including soil, sediment, freshwater and vegetation, which was not possible before. This will contribute to the establishment of a national database on terrestrial radioactivity.

The improved technical capabilities of the environmental monitoring network in Uzbekistan can now be used to support environmental impact assessments, verify environmental safety and prepare for the implementation of environmental remediation programmes. With the human and technical capacity established, the laboratory can play a future role as a regional centre for the control of contaminants in the environment. The laboratory is currently in the process of being integrated into the Analytical Laboratories for the Measurement of Environmental Radioactivity (ALMERA) network coordinated by the IAEA, as a national laboratory that would be expected to provide reliable and timely analysis of environmental samples in the event of an accidental or intentional release of radioactivity. This will also allow the staff involved to participate in the dedicated analytical trainings organized by the IAEA for the ALMERA network.

PROJECT INFORMATION

Project No: UZB1004

Project title: Enhancing the Capabilities of the Environmental Radiation Monitoring Network and Improving the Laboratories of the National Hydrometeorological Service

Duration: 2016-2017 (2 years)

Budget: €152 200

Contributing to:



Partnerships and counterparts

The project counterpart was the Centre of Hydrometeorological Service (Uzhydromet), Uzbekistan. The Hydrometeorological Scientific Research Institute in Ukraine and the Republican Center for Radiation Control and Environmental Monitoring in Belarus supported Uzhydromet throughout the project to achieve its goal of increasing the number and quality of measurements. Exchange of information and best practices between the laboratories has continued beyond the project lifetime.

Facts and figures

- The new analytical equipment will now allow the determination of activity concentrations of low level alpha-emitting radionuclides –only gross alpha-beta measurements could be performed before;
- With the new sampling equipment, it is now possible to monitor the existing radioactivity levels in all environmental media including soil, sediment, freshwater and vegetation;
- Ad-hoc air monitoring at country borders and emergency situations can now be performed using the portable air sampler;
- Radon levels in closed spaces and environmental media can now be assessed with the new radon monitor.