

Radiological risks from uranium tailing.

A. K. Tynybekov, J. E. Kulenbekov, M. S. Aliev

Kyrgyz Russian Slavonic University

We had conducted investigation to ascertain radiological situation in Issyk-Kul region for 2 years (1997-1998) for project named "Radiological Monitoring of Issyk-Kul region" financed by CRDF (USA). It was obtained data of radiation background level of the territory and drawn up maps with indices of radiation level in region.

The methods of measurement represented simultaneous removal of values of coordinates of a site from the help of satellite device GPSR and measurement of a radiating background by exponometer-detector Eberline. During expeditions the parameters of a radiating background were saved in the memory of exponometer-detector. The satellite device with regular frequency automatically fixed a longitude and breadth of a deposit, and also kept these data in the memory.

The objects of conducted investigation were southern coastal area of Issyk-Kul lake including 7 settlements and 5 rivers (fig.4). in Djety-Oguz and Ton districts. It was studied natural radiation background of locality, as well as defined content of radioactive elements: Thorium (Th), Radium (Ra). 2000 measurements were made and 400 probes were selected.

Soil probe selection and preparation them for analyzing according common method: the probes were selected with envelope method on the expectation to every works represents themselves part of soil, which typical for layer of this soil type. In case of controlling pollution soil of Kadji-Sai tailing dump; the probe areas were outlined along the vectors "wind rose". It was withdrawing 5 points probe of one probe area. Common probe mass of one area is consisting of no more 1 kg. All taken probe transported in glass container (the weight is 200 grams) until process of analyzing. After probes delivery at laboratory we separated big clods of soil with pistil, cleaning up from the roots, insects, stones, glasses ect. and sifted through sieve with 1 millimeter of hole diameter.

Analysis of soil probe was conducted in radiometric laboratory of Physics Institute, National Academy of Science, Kyrgyz Republic with maintenance of scintillation gamma spectrometer.

This device is aimed at measurements activity and concentrations of radioactive isotopes, which are decaying with accompany gamma radiation and allow defining content of gamma active radionuclides. It was defining the quantity radioactive elements. Under the analyzing results and other data were worked out the common picture of radioactive element (thorium, radium) content inside of soil in this region.

Distribution and processing of obtained data were conducted with using personal computer and special softwares.

Also it was conducted selective measurements of radiation level inside of dwelling in different settlements of Issyk-Kul province. The selection of investigating houses was casual character, though trying to cover both relatively new and old buildings. On table1 represents indices radiation level of inside and sort of dwellings including that the measurements conducting daytime in fall-summer period, when in air in the dwelling due to often ventilation marked minimum content of radon. Therefore in coastal area of Issyk-Kul lake was conducted radiological survey of radiation background inside of dwelling including coordinate characteristics for longitude and latitude, date and time measuring as well as sort of buildings.

Drawn up detailed map including coordinate characteristics and indication of inside and outside radiation level. To present the received results as radio-ecological map.

During scientific-researching works was conducting several expedition on southern coastal of Issyk-Kul lake while were measuring radiation background and selected water and soil probs. Obtained measurement results of locality were analyzed including coordinate characteristics and for these data drawn up map, which visually demonstrated common radio-ecological situation in researching areas and locality nearby rivers mouth inflowing lake .

While implementing the investigation were conducted selected measurements of gamma background inside of dwelling in different settlements of Issyk-Kul province. The analyzing result showed significant difference of exposure dose of inside of studding settlements. On fig.2 represents average indices inside

and outside radiation and difference in their level. The analyzing result showed significant difference of radioactivity level inside of dwelling.

It was defined locality with high radioactivity volumes, which are on beach nearby Djenish village, and in the territory of former producing lot No.7 near by Ton village. The high radioactivity level in different places was interpreted with higher content of radioactive element of thorium.

The results of fulfilled work showed that on investigated territory common outside radiation is in standard limit, but inside radiation level exceed in several times the natural standard.

There is the necessity to conduct detailed further investigation to find out reasons high contents of radon in air of dwellings.