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Safe management of wastes from former mining and milling activities in Kyrgyzstan

254, 4 million cubic meters of mining activity's wastes are accumulated in 92 sites on the territory of Kyrgyz Republic. 36 tailings and 25 dumps with total volume of 15,7 million of cubic meters were to responsibility of Ministry of Emergency Situations (MES) of KR by Governmental Decree of KR after collapse of Soviet Union including:

- ✓ 31 tailings with radioactive wastes and volume of 7,2 million. Cubic meters
- ✓ 5 tailings with toxic wastes and volume of 5,2 million cubic meters
- ✓ 25 mountain dumps of non-conditioned ores and volume of 3,3 million cubic meters

Long-term measures on protection against natural process effects (landslides, flood and mud stream) were not taken into account during designing and deposition of tailings. Many tailings were formed within the residential sites: Mailisu, Minkush, Shekaftarp, Sumsar, Kajisay, Aktyuz and Kan. All tailings and mountain dumps excluding tailings in Kajisay settlement are located in river basins of Narin, Mailusu, Sumsar, and Chu and have trans-boundary character.

In accordance with specialist's data currently there is a high risk of radiation and dangerous ecological catastrophe occurrence and territories of Kyrgyz Republic, Kazakh Republic, Tajik Republic and Republic of Uzbekistan are falling under contamination impact where approximately 5 million people are living.

Tailing on the territory of Mailusu city.

Uranium deposit of Mailuu-Suu operated from 1946 till 1967. Currently 23 tailings and 13 mountain dumps are located on the territory of former enterprises including those close to residential territories.

Total volume of uranium industry wastes deposited in tailings is approximately 1,99 million m³, wastes volume of non-conditioned ores is 940,5 thousands m³.

Tailing of Min-Kush settlement

Uranium deposit located in districts of Minkush settlement operated from 1958 till 1969.

Industrial complex consisted of the premises of basic and secondary industry and residential settlement.

Ore extraction carried out by underground and mountain operations. Ore-reprocessing industry included enriching plant, residue sector, and ore storages.

4 tailings ("Tyuk-Suu", "Taldi-Bulak", "Kak" and "Dalnee") with total volume of materials wastes 1,15 million m³ and 2 ore storages remained after decommissioning of enterprise's activity in districts of Minkush settlement.

Tailings are located in high-seismic and mud stream dangerous zone.

Tailing in AK-TYUZ settlement.

4 tailings with residue materials of semi-metal ores enrichment are located in district of AK-TYUZ settlement, where 5,7 million m^3 of residue material containing thorium are accumulated.

Average gamma-background on the tailing's surface is 60-100 microR/hour, on anomalous parts till 1500 microR/hour.

II. Orlovka, Chuysk oblast, Buurdinskiy tailing

- Extraction and enrichment of semi-metal ores;
- One tailing with volume of 3.20 million m^3 .
- Basic contaminated substances: zinc, lead, cadmium, thorium.

Tailing of Kaji-Say settlement.

Tailing in Kaji Say settlement with total volume of radioactive residue materials 150 thousands m^3 is located in 1,5 km distance to the south from unique Issik-Kul lake.

Radiation background on the surface of tailing is 30–60 microR/hour, locally up to 1500 microR/hour.

Shekaftar settlement.

8 dumps of non-conditioned uranium ores with volume of 700 thousands m^3 are located in the territory of Shekaftar settlement.

Gamma-emission dose rate: 60-150 microR/h.

Radionuclides contamination is taking place not only in Shekaftar settlement but on the territory of Ferghana valley as well.

Sumsar settlement.

- Period of operation: 1950-1978 yy.
- 3 tailings with volume of 2.65 million m^3 .
- Contaminated substances: salts of heavy metals.
- Tailing № 2. Gully in dam of tailing reaches the depth of 5m.

Tailing in Sovetskiy settlement (Kan)

Kanskiy ore management worked with lead-zinc ores from 1930 till 1971.

2,5 million m^3 of residue materials containing salts of heavy metals were accumulated in 2 tailings during operation which are located in very close distance to Sovetskiy settlement.

Tailings are not closed. Wind erosion, washout of residue materials by surface waters and contamination by heavy metals salts is taking place not only on the territory of Kyrgyz Republic but

territory of Uzbekistan Republic. Local residents spontaneously are making use of residue materials as construction materials.

The cost (orientation) for carrying out remediation and recultivation works only on tailings will be approximately 50 million USD dollars, namely:

1. Mailuu-Suu tailing, mud-stream -16,8 million USD dollars
2. Min-Kush tailing -16,9 million USD dollars
3. Ak-Tyuz tailing - 1,6 million USD dollars
4. Orlovka settlement (Burdinskiy tailing) - 3,0 million USD
5. Kaji-Say tailing - 3,7 million USD dollars
6. Mountain dumps of Shekaftar settle-t - 1,5 million USD
7. Sumsar tailing - 5,0 million USD dollars
8. Sovetskiy tailing -2,0 million USD dollars

Measures undertaken by MES on ensuring safe management of tailings:

MES developed complex program on top-priority activities with priority indication of remediation and recultivation works on tailings with the purpose of ecological safety ensuring in Central and Asian region against radioactive contamination by Governmental Decree of KR.

MES undertake active cooperation with international organizations with the purpose of investments and grants attraction for carrying out remediation and recultivation of preserved tailings, cooperation is carried out with neighboring republics and Russia.

Project proposal are submitted to donor countries and international organizations for consideration of possible technical assistance and grant means issuance for carrying out remediation works of tailings.

Projects funded by international organizations and donor countries were implemented and in the process of implementation in result of carried out works during the recent years on investments attraction for tailings:

- Project “Prevention of emergency situations” funded by the World Bank is implements starting from 2004 MES of Kyrgyz Republic for the purpose of problem solution related to uranium tailings in Mailuu-Suu;
- Project of International Science and Technology Center (ISTC) is implemented from 2004 till 2005 in Kaji-Say: works on initial stage of tailing remediation are fulfilled (systems on surface waters diversion are restored, cascade dampers are constructed, works on sheltering of abnormal areas are carried out, areas with high activity on Kajisay settlement territories are decontaminated;
- Project “Geo-ecological survey and assessment of ecological loadings and risks in surroundings of mining and milling complexes” funded by the Government of Czech Republic is implemented from 2004 till 2006;
- Works on assessment of radiation situation in Minkush and Shekaftar settlements are carried out within the regional project «Radioactive wastes management», funded by NATO from 2006-2007;

- Design and exploratory works on remediation (recultivation) of “Tuyuk-Suu” tailing in Min-Kush settlement are initiated in may 2009 by Federal Agency of Russian Federation, within the decision realization of EurAzES member-states,
- International forum on high official levels on assessment of Kyrgyz Republic possibilities in radioactive waste management in trans-boundary context and mobilization of donor assistance in solution of problems on safe management of radioactive wastes took place in Geneva from 29th till 30th of June 2009.