

FIFTH NATIONAL REPORT FROM
TAJIKISTAN

Nuclear and Radiation Safety Agency
(State Regulatory Authority)
Republic of Tajikistan
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SECTION A: INTRODUCTION:

Young independent state (1991), socio-economic conditions affected by civil war (1992-1997), rich and bright history and culture, developing political system. Mountainous environment 93% mountain, only 7% arable land, world's third water resources per head and 50% glaciers of CA. Population is close to 9 million in 2020. Cotton the most important crop, fragile economy/ unstable growth, need for roads, future export of hydro electricity to bring revenue (3 stations under completion), production and export of cement is growing.

Tajikistan deposited an instrument of accession to the Joint Convention on 12 December 2007. There were no declarations or reservations attached to the instrument of accession. The Convention entered into force for Tajikistan 11 December 2008.

The Republic of Tajikistan is not a nuclear country, but it uses achievements of nuclear science and technology in a number of manufacturing branches, medical and research sectors. That is why the important problems for us are treatment with radioactive wastes which are occurred in result of these activities. Since there are no any nuclear industry, research reactor*, or other facility generating radioactive substances in Tajikistan, many of the requirements of the Joint Convention do not apply to Tajikistan. There is no nuclear fuel in the country. There are high level wastes - 4 Radioisotope Thermoelectric Generators (RTG's) which are temporary stored in the Republican Waste Disposal Site (50 km distance from Dushanbe) and uranium tailing dumps located in the North of Tajikistan. During 45 years in the territory of 6 regions of Soghd oblast (North of Tajikistan) there are 55 million uranium wastes are accumulated in 10 uranium tailing dumps with total area 170 hectares. Total activity is more than 6,5 thousands Curie.

Radioactive waste in Tajikistan originates mainly from the use of radioactive sources in medicine but also from uses in research, education and industry. There is central facility for long-term storage of radioactive waste that serves the whole country.

The Republic of Tajikistan is a young member of IAEA. The established regulatory authority is functioning for 11 years. Currently 5 Laws and more than 30 regulations are worked out for ensuring the radiation safety/security in Tajikistan and new regulations are under the process of development. Radiation safety in Tajikistan is based on the Law on Radiation Safety (June, 2003); the Law on Utilisation of Atomic Energy (November, 2004), the Law on Licensing of separate kinds of activities (May 2004) and Law on radioactive waste management (July, 2013)

The present report is the fifth Tajikistan national report. The report was prepared by the regulatory authority of the country – Nuclear and Radiation Safety Agency (State Regulatory Authority).

The report is prepared in compliance with requirements contained in the IAEA Information Circular INFICIRC/604/Rev.1 of 26 July 2002.

Tajikistan welcomes this opportunity to present the status of radioactive waste management in the country and to participate in a constructive dialogue on ways for improvement.

*There is an ARGUS research reactor in Tajikistan which was constructed in 1990. Upon the decision of 6 working session of Dushanbe town council (19 July 1991) all further works were stopped. The Argus research reactor was never uploaded by nuclear fuel

SECTION B: POLICIES AND PRACTICES

Tajikistan has no nuclear reactors and no nuclear fuel processing facilities.

Radioactive waste management policy

Radioactive waste management policy is fully described in the Second and Third National report of Tajikistan. In addition to that report, it is our pleasure to inform that the following important and main documents were developed and approved in the country:

- Law on Radioactive waste management (July 2013)
- Requirements on radioactive waste management (August 2014)
- RT Governmental Decree on National strategy for remediation of legacy sites for 2014-2024 yy (№505, 1 August 2014)
- RT Governmental Decree on State Authorized Body for legacy sites remediation (№524, 2 August 2014). ***Ministry of Industry and New Technologies is assigned by the Government to fulfill remediation tasks.***
- RT Governmental Decree on State Cadastre of RW storages (№507, 1 August 2014).
- State Cadastre on RW storages itself (Approved by RT Governmental Decree (№507, 1 August 2014). ***Nuclear and radiation Safety Agency is assigned by the Government to maintain the State Cadastre.***
- Registration Card for storages of RW temporary storage (Attachment to State Cadastre of RW storages)

Radioactive waste management practices:

Different practices covering sealed and unsealed sources, generators as well as categorization of radioactive sources are fully described in Second and Third National Report of Tajikistan.

In addition to stated practices in second and third national report, a new Co-60 machine for radiotherapy unit established in Soghd region (Northern part) of Tajikistan was delivered in 1st quarter of 2018 as well as Cs-gamma beam irradiator (GBI) system for technical Support Organization to Nuclear and Radiation Safety Agency (national Regulatory Authority) with remote control system and with Cs-137 source activity approx. 740 GBq (20 Ci) was delivered in May 2018.

considerably reduced radon exhalation and gamma-emission dose rates on the surface of the dump. Nevertheless, dumps here continuing to remain the risk factor since located only in 50 m distance from neighboring residential houses.



Gafurov tailings site: Note the proximity of dwellings, the cover appears intact with no obvious erosion features

For example, Degmay tailing dump, which is located in 2 km distance from the nearest residential settlement, is not covered at all and there is a free access to public and cattle pasture on the surface of the tailing dump, where vegetation has been grown up.



Degmay tailing covered with cracks that intensifies the radon exhalation and increases the risk of erosion of the surface and increases dusting by the wind.



The «Yellow hill» a waste rock pile of the factory “barren ore” created during the 1960s is one of the sites where remediation measures are required.



Drainage water salt deposits (with high contents of uranium in the sodium and sulphates crystals) on the bottom of the creek near the tailing dumps of I-II

An urgent remedial measure in Taboshar should be the treatment of the overflowing mine water discharging directly into Taboshar. Because of the lack of other water sources the local population uses this water. The analysis of the water samples shows that the water is highly contaminated



USE OF NON-ORGANIZED WATER RESOURCES BY LOCAL POPULATION

Tajikistan declares that during 45 years in the territory of 6 regions of Soghd oblast there are 55 million radioactive wastes that contains only naturally occurring radioactive material. They are accumulated in 10 uranium tailing dumps with total area 170 hectares. Total activity is more than 6,5 thousands Curie.

To assist to the Central Asia countries in this matter IAEA coordination group CGULS prepared Strategic Master Plan and agreed with countries and donors. According Strategic Master Plan in Tajikistan the priority sites for remediation are Taboshar (Istiklol) and Degmay, which will be remediated by support of Rosatom and European Commission.

Tajikistan has no military or defense programmes that produce radioactive waste.

SECTION D: INVENTORIES AND LISTS

Tajikistan is a non-nuclear country and has therefore no spent fuel subject to this convention.

Disused sources are stored under the control of Regulatory Authority on the user's premises until shipped to the Republican Waste Disposal Site (RWDS) in 50 km distance from Dushanbe for long-term storage. Currently the Republic of Tajikistan is revising its Law on Radiation Safety to make it in full compliance with IAEA GSR Part 3. Prepared law was sent for official comments, recommendations and advises to IAEA Office of Legal Affairs (OLA). This revised law obliges all registered users to make an agreement with manufacturer for returning back the imported radioactive sources to the country once they are becoming disused.

In second, third and fourth national reports Tajikistan described in details the national database which it operates.

SECTION E: LEGISLATIVE AND REGULATORY SYSTEM

In second, third and fourth national reports, Tajikistan described legislative structure in the country as well as structure of its regulatory authority. As mentioned earlier in this report after second national report submission, Tajikistan in order to improve regulatory control over

radioactive waste, legacy sites and thus to protect public and environment against harmful effect of radioactive waste approved the following legislative documents:

- Law on Radioactive waste management (July 2013). Main law which regulates all activities of physical and juridical persons related to radioactive waste management in the country as well as ensures public and environment protection against harmful effect of radioactive waste.
- Requirements on radioactive waste management (August 2014)
- RT Governmental Decree on National strategy for remediation of legacy sites for 2014-2024 yy (№505, 1 August 2014)
- RT Governmental Decree on State Authorized Body for legacy sites remediation (№524, 2 August 2014). **Ministry of Industry and New Technologies is assigned by the Government to fulfill remediation tasks.**
- RT Governmental Decree on State Cadastre of RW storages (№507, 1 August 2014).
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The latest document, which was developed in this area in cooperation with IAEA, ISTC and DSA is Requirements for remediation of contaminated areas from radioactive materials, and approved on 29.12.2020, #1048.

REGULATORY PROBLEMS:

In this report we would like to raise some regulatory problems which exists in the country in regard to legacy sites remediation.

Legal and regulatory framework of the Republic with regard to the safe management of the former uranium industries is still not well developed and therefore requires improvements and harmonization with international recommendations, in particular with the Basic Safety Standards of the IAEA. The standards and guidelines on how to provide safe management, rehabilitation and in some cases secondary reprocessing of the uranium waste rocks and tailings are either absent or not implemented because of a lack of experience. There is also a lack of adequate mechanisms for putting the already existing laws into operation properly.

In particular, there are no clear requirements for environmental monitoring and data reporting, and the assessment and recording of doses to which personnel and the public are exposed at the uranium legacy sites are not well developed.

The exemption and clearance safety criteria as well as the exemption and clearance levels which have to be established and which apply everywhere including the former uranium facilities according to the IAEA BSS, have not become an effective tool for radiation protection practice and the safe management of the former facilities in the country.

It is impossible to ensure environmental and public safety and the secondary processing of uranium industry waste without the corresponding legislative and regulatory framework and professional staff.

In this regard, the joint project of the Nuclear and Radiation Safety Agency and the Norwegian Radiation Protection Authority was highly important and timely for the Tajikistan Republic, as it provided the development of a normative legal framework for controlling uranium production waste, mining activities, secondary processing and training of professional staff that is a

foundation for the implementation of any programs concerning the uranium tailings impoundments in northern Tajikistan.

The Threat Assessment Report carried out under this project demonstrated the following important constraints for the development and implementation of efficient regulatory control:

- Inadequate regulatory and legislative framework for the safe management of radioactive waste.
- Costs of remediation and limited availability of national funding.
- Regulatory development issues.
- Inadequate knowledge of the inventory of legacy components and the risks associated with them
- Very varied public and social attitudes toward the legacy sites.
- Inadequate legislative and regulatory framework for the operation, closure and environmental remediation of mines.
- Lack of personnel with uranium mining and milling experience or knowledge of remediation activities.
- Shortage of state-of-the-art equipment and machines.
- Cross-border regional problems related to the former uranium facilities in Central Asian countries.

WAYS FORWARD:

At present, Tajikistan needs a consistent and reliable assessment of its legacy sites and components, which should include:

- ✓ Characterization of the inventory of both radioactive and non-radioactive contaminants.
- ✓ The effluent and influent streams from the sites and emissions into the air.
- ✓ Information on the geotechnical stability of the sites, erosion, stability of the current containment barriers, if any, and the design details of the containment barriers.
- ✓ A safety assessment and an environmental impact assessment.

Developing an understanding of a site requires an appropriate monitoring and surveillance plan, including specifications of where to sample, how to sample, and how many samples must be taken, etc. The use of the recently acquired instruments and equipment should be incorporated into these plans.

The decisions regarding in-situ stabilization or relocation of residues such as tailings should be based on the assessment results obtained on the basis of the new data.

As for filling all of the gaps in the regulatory and legislative framework, the following safety requirements or actions were identified for development and implementation:

- ✓ Elaborate the draft national policy and strategy for radioactive waste management to be approved and implemented by the government.
- ✓ Review, update and elaborate the necessary legal and regulatory framework for the safe management of existing exposure situations and radioactive waste. This includes the regulatory basis for the licensing of future disposal facilities, including the elaboration of safety assessments, safety cases and environmental impact assessments.
- ✓ Review, update and elaborate the necessary legal and regulatory framework (including authorization, inspection and enforcement) for the safe management of radioactive waste and radioactive waste management facilities, including those linked with the production of NORM waste.

- ✓ Clearly define how the responsible organizations will realize the national policy for radioactive waste management with use of the available technical measures and financial resources.
- ✓ Define how and when the identified objectives and tasks will be achieved.
- ✓ Define what level of competence is necessary in order to achieve these tasks, and how it will be provided.
- ✓ Develop the management pathways for each type of radioactive waste, through all stages of the RW life cycle (from the moment of generation to disposal), as part of the national strategy for radioactive waste;

Strengthen the trust of the public concerning radioactive waste management and remedial action:

- ✓ Establish mechanisms for providing resources and funding for the safe decommissioning, remediation activities and long-term RW management.
- ✓ Guarantee the availability of sufficient and qualified human resources to perform the rehabilitation activities and safe management of radioactive wastes, including resources for training and R&D where needed.
- ✓ Implement the monitoring of radioactive waste storage facilities and disposal sites both during their operation and after their closure (including post-closure institutional control where needed).
- ✓ Perform the safety assessment and radiological impact assessment for the contaminated territories and take the necessary measures to diminish the risks in accordance with the results of this assessment.
- ✓ Carry out long-term monitoring and control over the abandoned objects of the uranium industry, and take the necessary security measures to prevent unauthorized access to the contaminated sites.
- ✓ Develop safety requirements for the design and implementation of radiation monitoring of the sites contaminated with natural and artificial radionuclides.
- ✓ Develop and implement projects concerning the final disposal or secondary processing of radioactive materials.
- ✓ Develop and implement the necessary projects concerning restoration.
- ✓ Introduce the safety requirements for existing exposure situations including the establishment of the quantitative criteria defining the “reference levels” and consider that the rehabilitation of the sites will be strongly dependent on the established safety criteria (reference levels) and the existing exposure situation.
- ✓ Develop criteria and hygienic specifications for the rehabilitation of sites contaminated by radionuclides.

This could provide socially comprehensible guarantees of radiation safety for the population local to the sites of radioactive contamination.

- ✓ Develop regulatory documents for maintaining the radiation safety of personnel and the public during the subsequent use of the site, buildings and structures after rehabilitation. Guidance should be developed for the derived levels of residual contamination of the site with radioactive substances for several most probable options for their use after rehabilitation, for example, sites of unlimited use; sites of limited use for industrial purposes with the use of radioactive materials; sites of limited use for industrial purposes without the use of radioactive materials.
- ✓ Develop derived reference levels for the radiation parameters that can be directly measured when implementing radiation control.
- ✓ Develop a classification scheme for radioactive waste in accordance with the recently approved IAEA international recommendations in this regard.
- ✓ Develop and approve safety requirements (regulations) for the design, siting, construction, operation, closure and establishment of institutional control needed for

disposal facilities in accordance with the approved national policy and strategy on radioactive waste management.

- ✓ Authorize projects concerning the secondary processing of the uranium tailings impoundments with the purpose of extracting uranium.

In the case of secondary processing of the uranium tailings impoundments and extraction of uranium or other minerals from mine waters, it is necessary to implement and enforce an authorization process that will require the potential investors to be responsible for the implementation of the projects concerning restoration at every tailings impoundment involved. This process should include:

- ✓ Performance of a safety assessment and radiological impact assessment.
- ✓ Rehabilitation and secondary processing of the uranium tailings impoundments.
- ✓ Final disposal and rehabilitation of the off-balance ores and extraction of uranium from mine waters.
- ✓ Final disposal and rehabilitation or dislocation of the secondary processing of the uranium tailings impoundments.
- ✓ Organization and implementation of the requested (when needed) institutional control of existing tailings impoundments.

The NRPA project will give priority to these regulatory documents, which should be developed to eliminate existing gaps in the regulatory basis, based on an assessment of what possible future influence the absence of these documents might have on the public. It is also clear that in order to remove the threats associated with the presence of radioactive wastes - both those which have already accumulated as a result of previous activity and those which are currently being generated in significant amounts and which could be produced in the future - it is necessary to develop at least the following documents:

- ✓ A national policy and strategy for radioactive waste management.
- ✓ A new classification scheme for radioactive waste, including identification of the corresponding categories.
- ✓ Safety requirements for the design, siting, construction, operation, closure and establishment of institutional control needed for disposal facilities in accordance with the approved national policy and strategy on radioactive waste management.
- ✓ Safety requirements for the management of radioactive waste.
- ✓ Safety requirements for existing exposure situations as well as a clearance policy and clearance levels to be applied.

It is also clear that in order to remove the threats associated with the presence of extensive sites contaminated by radionuclides, their rehabilitation is required and, accordingly, it is necessary to develop a legal and regulatory framework defining:

- Responsibilities of the government, the licensees (operators) and other interested parties in existing exposure situations.
- Justification and optimization of protective actions in existing exposure situations, including safety-related criteria such as “reference levels” and derived quantities to be directly measured.

- Institutions or organizations to be responsible for the remedial actions and the implementation of institutional control in areas with residual radioactive materials.
- Criteria and hygienic specifications on the rehabilitation of sites contaminated with radioactive materials.
- Regulatory framework preventing the occurrence of similar situations in the future.

Threat assessment process revealed that in first stage it is necessary to develop the following legal documents of high priority with regard to radioactive waste regulation:

- 1) Law on radioactive waste (some provisions in this law include policy and strategy statements).
- 2) Rules of radioactive waste management (PORO).
- 3) Routine of state accountancy and control of radioactive material and radioactive waste.
- 4) Procedure for issuing a license on activity dealing with the exploitation, mining and production of uranium, as well as with the secondary processing of waste from the uranium industry.
- 5) Regulation on ensuring radiation safety for the stock-piling and disposal of radioactive scrap metal.
- 6) Regulation on the treatment of mineral raw material and material with a high content of natural radionuclides.
- 7) Regulations regarding the expert examination of documents substantiating the guaranteed nuclear and radiation safety of nuclear installations, radiation sources and quality of declared activity.
- 8) Rules of radiation safety in the transportation of radioactive material and radioactive waste.
- 9) Safety requirements for:
 - a) existing exposure situations;
 - b) shutdown and decommissioning;
 - c) remedial actions;
 - d) monitoring.

SECTION F: OTHER GENERAL SAFETY PROVISIONS

General safety provisions are fully described in second, third and fourth national reports of Tajikistan. There are no outstanding changes up to the moment.

SECTION G. SAFETY OF SPENT FUEL MANAGEMENT.

This section containing articles 4-10 is not applicable to Tajikistan.

SECTION H. SAFETY OF RADIOACTIVE WASTE MANAGEMENT

Safety of radioactive waste management is fully described in second, third and fourth national reports of Tajikistan. There are no outstanding changes up to the moment.

SECTION I. TRANSBOUNDARY MOVEMENT

Trans-boundary movement provisions are fully described in second, third and fourth national reports of Tajikistan. There are no outstanding changes up to the moment

SECTION J. DISUSED SEALED SOURCES.

In addition to information on disused sealed sources reported by Tajikistan under this Convention in its second and third national report, we would like to inform that more than 76 orphan and disused sources revealed in Southern and Central part of Tajikistan under GTRI “Search and secure project” were safely transported to the Republican Waste Disposal Site. Project on transportation was financially supported by National Nuclear Security Administration (NNSA) through Pacific North-West National Laboratory (PNNL).

In legislative terms, Tajikistan revised its Law on Radiation Safety to make it in full compliance with IAEA GSR Part 3. Prepared law was sent for official comments, recommendations and advises to IAEA Office of Legal Affairs (OLA). This revised law obliges all registered users to make an agreement with manufacturer for returning back the imported radioactive sources to the country once they are becoming disused.

In 2018 after NRSA inspections to the users of Radioactive sources number of disused sources were identified and transferred to Republican Waste Disposal Site.

SECTION K. PLANNED ACTIVITIES TO IMPROVE SAFETY.

There is a general goal of the regulatory authority to continuously improve safety and enhance radiation protection in all activities involving ionizing radiation. With regard to radioactive waste it has been decided that inspections are focus more on waste aspects of practices using radioactive substances raising awareness among license holders on their responsibilities regarding radioactive waste arising from their activities. The scientists of the regulatory authority elaborated two methods for second reprocessing of radioactive wastes located in uranium tailing dumps. Two dissertations were defended on that theme. These methods help to solve two problems. First is ecological and second is uranium extraction which is very valuable raw for Nuclear Power Plants. The regulatory authority of the country fruitfully cooperates with number of international organization on improving the situation especially in the North of Tajikistan. The rehabilitation of the territories contaminated from former mining and milling activities is priority one for the country.

A number of regulatory documents which were developed and approved after second national report submission which is outlined in **SECTION E: LEGISLATIVE AND REGULATORY SYSTEM** currently come into force and other secondary regulatory requirements are developing. Inspections are carried out by NRSA to verify operator compliance with recently approved regulatory documents.

To improve safety of radioactive waste a number of international projects were completed, still going or planned:

Main outcomes from bilateral Project with NRPA, Norway:

- Threat assessment report, which revealed a weakness in the regulatory management of legacy sites in the country.
- Law on Radioactive Waste Management (which included some provisions on RWM policy and strategy – a separate document is in the process of elaboration). The current law was approved after four years of its discussion in different ministries and authorities of Tajikistan in 22 July 2013.
- Radioactive waste management requirements (in full compliance with IAEA standards but based on the Russian version. Inconsistencies with IAEA standards were excluded. The document has been elaborated and approved by the director of the NRSA.
- “Requirements for carrying out monitoring of sites (radiation control)”. This document was developed in accordance with the IAEA Safety Standards. The document has been elaborated and approved by the director of the NRSA.

PROJECT WITH EU:

The regional project REG 4.01/10 (Financing agreement No.NSI/2011/22-653 was signed last year in December 2011) "**Establishment of a legislative and regulatory framework for the remediation of uranium mining legacy sites in Central Asia, establishment of a regional watershed monitoring system and capacity building in analytical techniques, training and education and information exchange**" has an overall budget of 2.5 mill Euro.

The project foresees "Establishing recommendations for a legislative and regulatory framework". This sub-component takes into account the on-going Norwegian regional project focusing on national policy and strategy for radioactive waste management.

The regional project REG4.01/10 also foresees the establishment of national laboratory capacity (centralized laboratory and on-site laboratories) that is needed to create the watershed monitoring system.

Comprehensive Environmental Impact Assessment (EIA) and Feasibility Studies (FS) for Degmay and Taboshar.

These studies were finished in 2018 and information for choosing the most appropriate final remediation works option for Degmay and Taboshar are collected.

Taboshar water treatment facility MC4.02/13 (A)

The overall indicative amount is 2.5 MEUR.

Project objectives:

- ✓ The design and engineering of a water treatment facility needed for the cleaning of the contaminated waters from the Taboshar legacy site;
- ✓ The supply and installation of the water treatment facility at Taboshar

PROJECT WITH EURASEC:

The Council on cooperation of the peaceful use of atomic energy under the Integrated Committee of Eurasian Economic Community (EurAsEC:) considered and approved the project of the Inter-state targeted program "Recultivation of EurAsEC member-states territories subjected to impact of uranium mining and milling industries".

Sites in Min-Kush and Kaji-Say villages in Kyrgyzstan and in Istiklol (formerly Taboshar) in Tajikistan were selected as priority sites. The total cost for Program is 40 million US\$. The program has been divided into two stages :

Stage I (2013-2016)

Stage II (2017-2018)

The second stage is extended to 2024 to finish all physical remediation works in Tajikistan.

NATIONAL CONTRIBUTION

The Government of Tajikistan is currently funding a project, carried out by "Vostokredmet" to develop criteria to determine the environmental hazards of contaminated sites, the relative ranking of the extent the hazards of these sites and remediation programs required to remove their environmental impact:

ANNUAL BUDGET FOR REMEDIATION OF URANIUM TAILINGS

Year	Somoni	US\$ (approx.)
2009	200,000	47,500
2010	164,000	45,700
2011	250,000	56,800
2012	400,000	85,100

The Government of Tajikistan is currently funding construction of four floor building of Technical support organization to Nuclear and Radiation Safety Agency to conduct monitoring of uranium production legacy sites and verification of remediation works doing by operators. Additionally, Government of Tajikistan is planning to support of construction of building of Branch Office of Nuclear and Radiation Safety Agency in Buston, Soghd Region (North of Tajikistan) to implement regulatory activities in this region.

ACTIVE AND COMPLETED IAEA PROJECTS

IAEA NATIONAL PROJECTS:

TAD/7/002 “Supporting Radon Monitoring of Uranium Tailings”

TAD/1/001 “Upgrading Laboratory Capabilities for Environmental Monitoring to Improve the Radiological Safety of the Public and the Environment”

TAD/9/005 “Enhancing the Environmental Monitoring Regime to Alleviate Radiological Hazards”

IAEA INTERNATIONAL AND REGIONAL PROJECTS

INT/9/175 “Promoting safe and efficient clean-up of radioactively contaminated facilities and sites”

INT/2/020 “Enhancing Capacity Building to Promote Successful Decommissioning and Environmental Remediation Projects”

INT/9/183 “Overcoming the Barriers to Implementation of Decommissioning and Environmental Remediation Projects”

RER/0/033 “Supporting Quality Assurance for the Measurement and Monitoring of Radioactivity in the Environment”

RER/3/010 “Supporting Preparation for Remediation of Uranium Production Legacy Sites”.

RER/9/086 “Safe Management of Residues from Former Mining and Milling Activities in Central Asia”.

RER/9/121 “Supporting Environmental Remediation Programmes”.

RER/9/122 “Supporting Safe Management of Uranium Production Legacy Sites”.

RER/9/127 “Establishing Enhanced Approaches to the Control of Public Exposure to Radon”.

RER/7/008 “Strengthening Capabilities for Radionuclide Measurement in the Environment and Enhancing QA/QC System for Environmental Radioactivity Monitoring”

RER/7/014 Improving Environmental Monitoring and Assessment for Radiation Protection in the Region

CONCLUSION:

Priority sites for remediation should be Degmay (with the purpose of dusting prevention and radon exhalation from its surface) and former uranium industry sites in Istiklol (water purification and determination of controlling zones). In accordance with preliminary calculation

of SE “Tajredmet” specialists the reference costs for remediation of these sites including pre-design, exploratory and design and of course physical works is around 200 million US dollars. Currently economics of Tajikistan doesn’t possess such means and here international organizations and funds are necessary.

In conclusion it is necessary to mention that implementation of international projects with IAEA active participation facilitated to expanding cooperation and mutual understanding among Central Asian countries in issues of environmental protection. Re-establishment of radiation control system on former sites of uranium industry of the Republic of Tajikistan is the first step to their full remediation.

Annex-1

Disused sealed radioactive sources in Tajikistan as of 1 April 2021

Kind of waste	Radionuclide	Activity	ActivityUnit	From
55 million tons of radioactive wastes	Uranium chain	65	kCi	Industrial
4 RTG	Sr-90	70	kCi	Hydrometeorology stations