Remediation of Uranium Sites in Romania
Current Status

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The Legal Basis for the remediation of Uranium Sites (1)

Law no. 111/1996 on the safe deployment, regulation, authorization and control of nuclear activities, republished

Radiation Protection Fundamental Norms

Radiological Safety Norms for Occupational Radiation Protection in Uranium and Thorium Mining and Milling

Radiological Safety Norms on the Management of the Uranium and Thorium Mining and Milling Radioactive Waste

Radiological Safety Norms on the Conservation and Decommissioning of the Uranium and/or Thorium Mining and Milling Facilities

Radiological Safety Norms – Authorization Procedures of the Uranium and Thorium Mining and Milling

Guidelines on the recommended parameters for the Estimation of the effective doses on all ways of exposure

Guidelines on the Criteria of release from authorization regime of CNCAN in order to use for other purposes of the buildings, materials, facilities, dumps and areas contaminated following the activities of mining and milling of uranium and/or thorium ores

Guidelines on the technical requirements for design, sitting, construction, operation, closing and decommissioning of storage of uranium ore facilities and decommissioning of the uranium and thorium milling waste disposal areas
Law 111/1996, on the safe deployment, regulation, authorization and control of nuclear activities, republished in 2006, states:

Chapter I, General Provisions, art. 2 b)

The provisions of the present law shall apply to the following activities and sources:

- design, possession, sitting, construction-assembly, commissioning operation, conservation and decommissioning of the mining and milling facilities for uranium and thorium ores and of the waste management facilities of the waste resulted from the mining and milling thorium ores.

Chapter II, Authorization conditions, art. 8 paragraph (1)

The activities and sources stipulated under Article 2 require an authorization issued by the Commission in compliance with the authorization procedure typical of each kind of activity or source and with the provisions of Art. 5.
Based on the Art. 5 (1) provisions of Law 111/1996 on the safe deployment, regulation, authorization and control of nuclear activities, republished in 2006, the National Commission for Nuclear Activities Control issued a group of Radiological Safety Norms for Uranium and Thorium mining and milling, as it follows:

1. Radiological Safety Norms on Occupational Radiation Protection in Uranium and Thorium Mining and Milling


3. Radiological Safety Norms on Decommissioning of Uranium and Thorium Mining and Milling Facilities

1. Guidelines on the recommended parameters for the estimation of the effective doses on all ways of exposure

2. Guidelines on criteria for release from CNCAN authorization regime for use in other purposes of buildings, materials, facilities, dumps and lands contaminated by mining and milling of uranium and thorium ores

3. Guidelines on technical requirements for design, sitting, construction, operation, closing and decommissioning of storage of uranium ore facilities and decommissioning of the uranium and thorium milling waste disposal areas
Two state enterprises have legal responsibility with respect of remediation of uranium production legacy sites in Romania:

- **The Uranium National Company S.A.** was set up by the Government’s Decision No. 785/1997, modified by Government’s Decision No. 729/2004 and is responsible for administrating the uranium mineral resources existing in Romania.

- By the Government’s Decision No. 729/2004 all the former activities related to uranium mining exploitation, uranium ore processing and uranium concentrates conversion to UO$_2$ sintered powder are transferred to the National Uranium Company S.A.

- By the same Government’s Decision No. 729/2004 the geological research for uranium are transferred to a new company named “Radioactiv Mineral Magurele S.A.”

- Annex no. 3 at Government’s Decision No. 729/2004 contains the list of all sites where the Uranium National Company carried out geological research for uranium
By the Government’s Decision No. 313/2002 modified and added up by Government’s Decision No. 173/2003 and Government’s Decision No. 1158/2004 was set up a new trading company named “CONVERSMIN S.A.”, subordinated to the Ministry of Economy.

According to Art. 1, paragraph (3), Trading company “CONVERSMIN S.A.” has as main activity object:

a) the conservation of mines from shut-down until starting subscription of the closing contract;

b) closing of underground mines and ecological remediation;

c) operating, maintenance and remediation of the facilities resulted by the break-up of closing activity, in order to preserve the designed environmental parameters;

d) Post-closure monitoring of closed mining facilities.
According to Art. 3, paragraph (1) of Government’s Decision No. 1158/2004:

"Financial funds of the trading company “CONVERSMIN S.A.” are constituted by:

1. The amounts allocated from state budget by the budget of Economy Ministry to carry out the works included in National Annual Program for conservation, closing, ecological reconstruction and post-closing surveillance of mining objectives (including uranium mines).

2. Own capital realized by contracting and executing works financed by the programs and financial projects based on the agreements between Romania and international institutions.

3. The conservation and definitive closing of each mine (or mining site), including uranium production sites, are approved by Government’s Decision.

4. Also, the mentioned Government’s Decisions contain the amounts approved for the elaboration of the technical closing documentation and, separately, for conservation, closing and remediation works, for each mine, including uranium production sites.
The official document for the definitive closing of each uranium site, environmental restoration and monitoring is Government’s Decisions.

- Government’s Decisions No. 17/1999 (Ciudanovita mine)
- Government’s Decisions No. 720/1999 (Mines: Ranusa, Lisava and Avram Iancu)
- Government’s Decisions No. 602/2001 (Hojda-Magura mine)
- Government’s Decisions No. 1846/2004 (Mines: Milova, Repedea-Poienile)
- Government’s Decisions No. 644/2007 (Mines: Baita Plai Partial, Dobrei Est and Rapsag; Tailing pound Cetatuia Feldioara – Compartment 1)
In the Government’s Decision for definitive closure of each uranium site are nominated amounts needed for closure, environmental restoration and post-closure monitoring.
The radiological safety assessment

The technical decommissioning project

The analysis on the radiation safety of the occupational exposed workers and of the environment on the time of decommissioning activity

The radiation protection program

The quality assurance program in the decommissioning stage

The monitoring and surveillance programs of the radioactivity of the environment factors
- The documents proving the technical capability and accreditation or authorization provided in the legislation in force for the legal bodies and for the physical bodies involved in the decommissioning activity

- The document stating the definitive cessation in view of decommissioning

- The intervention plan in case of emergency

- As applicable, physical protection plan and the procedures on the access in the facility to be decommissioned,

- Environment authorization or agreement
Before starting the closing works in compliance with technical documentation approved by CNCAN, the holder of CNCAN decommissioning authorization must obtain the environmental agreement from local Environmental Protection Agency (EPA). The environmental agreement is issued by the EPA only if local community agrees with this decommissioning project, after a mandatory public discussion with community members takes place.
Locating the Main Uranium Sites in Romania and their state

- Baita Plai - Open Pit and Mine (Conservation)
- Avram Iancu mine (decommissioning)
- Repedea-Poienile de sub Munte Site - Remedied
- Tulghes Area – new uranium deposit
- Jolotca Site - Remedied
- Glogova Site - Remedied
- Mines: Dobrei, Natra and Ciudanovita (decommissioning)
- Crucea (Decommissioning) - Bobiana mines (operating)
- Romag Heavy Water Plant
- Pitesti Nuclear Fuel Plant
- NPP Cernavoda
- Făchioara Uranium Ore Processing Plant
- Tulghes Area – new uranium deposit

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Currently, in Romania there is only one mine (Mine Botusana) in operating.

There are about 50 uranium sites in accordance with the definition given for "legacy sites" in the Work Programme, adopted on 24 October, 2011 at the RSLS Technical Meeting in Vienne.

Most of them come from geological exploration of uranium ore and are small (in area and volume).

Only three of them are large and come from the exploitation of uranium deposits, requiring extensive works closure and environmental rehabilitation, respectively:
- Uranium mines group in Banat area (Ciudanovita, Lisava, Natra mines);
- Former Open pit Baita and Avram Iancu mine (Bihor area);
- Crucea Mine (Suceava county)
Activity closure and environmental remediation was completed at uranium sites:

- Glogova, Gorj county
- Jolotca, Harghita county
- Barzava, Arad county
- Repedea-Poenile de sub Munte, Maramures county
The current state of uranium sites closing activities and environmental remediation (2)

Termination of closure and environmental remediation is certified by regulatory body that issued the document “Certificate of termination of nuclear activities and the release of licensing regime”
Technical Documentation for obtaining “Certificate of termination of nuclear activities and the release of licensing regime” must contain:

– the final decommissioning report

– the final radiological safety assessment

– the document by which the local Environmental Protection Agency (EPA) certifies that the affected environment is rehabilitated
Activity closure and environmental remediation in progress at uranium sites:

- Uranium mines Ciudanovita, Lisava and Natra localized in Banat area
- Uranium mines Avram Iancu localized in Bihor area
- Uranium mine Crucea, Suceava county
- Uranium mine Baita Plai and Open pit Baita Plai, both localized in Bihor area (CONVERSMIN is preparing technical closing documentation in order to obtain decommissioning authorization from CNCAN)
Creating each year 150-200 new jobs - with positive economic effects for local communities

Improving water quality in surface hydrographic network especially in the Banat area

Protection of groundwater against pollution caused by natural radionuclides and heavy metals

Providing physical comfort for local communities located near the site uranium (as uranium Barzava site located within the town Barzava)
Completion of closure and remediation at uranium mines Ciudanovita, Lisava and Natra localized in Banat area

Completion of closure and remediation at uranium mine Avram Iancu localized in Bihor area

Completion of closure and remediation at uranium mine Crucea, Suceava county

Finding the best technical options closure and remediation of former uranium open pit Baita Plai and Baita Plai mine from the point of view of the benefit / cost, both localized in Bihor area; Preparing project closure and rehabilitation as the best option.
Remediation of open pit Baita Plai site, Bihor county – An challenge (1)
Remediation of open pit Baita Plai, Bihor county – An challenge (2)
THANK YOU!