Conception and Methodology of a Prospective Safety Report for Uranium Mills Tailings Ponds
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Uranium mill tailings ponds (MTP) stand for the highest potential risk of all legacies from uranium milling. The overall objective of this work was to develop a standardised application document and a working tool for responsible authorities to conduct a continuous safety status description and assessment as well as a prognosis of the respective tailings pond site.

> Safety Assessment Principles
are based on guide and control values specified in or derived from laws, guidances, norms or standards for the main components who are:
- technical installations & geo-mechanics,
- radioactivity,
- chemical-toxic pollutants.

> Data Base
- Monitoring data (ground- and seepage water)
- Radon in near bottom air
- Data and information from expertises, reports and technical documents
- Site specific data and information (data base A.LAS.KA. / FbU)

> Application case MTP „Lengenfeld“

> Exposure Pathways Analysis
- Determination of the radiation exposure to members of the public of different age caused by radioactivity discharges from the tailings pond by means of an authorized calculation procedure.
  - 0.1 to 0.3 mSv/yr with a predominant contribution of ingestion of drinking water (about 80 %)
- Determination of the hazard resulting from chemical-toxic pollutants according to German regulations.
  - Only relevance of Arsenic via seepage water path

> Forecast of Contaminant Propagation via Groundwater
A three dimensional site specific model was generated to forecast the contaminant distribution in the downstream groundwater flow by means of the available monitoring data.

> Safety Assessment
- The present status of the tailings pond „Lengenfeld“ was evaluated as to be safe for all three risk components and therefore it is no need for short-term measures to minimize hazards or to reduce the contaminants spreading via groundwater.
- The geochemical environment of the tailings can be regarded as steady, but they are hydraulically tensed by overlaying spar cover.
- The low permeability of the tailings prevents a significant vertical transport of contaminants into the underground.

> Conclusions
- Based on the results of the safety analysis it can be estimated that some kind of in-situ remediation represents the best suited option.
- Due to the system stabilising features the spar cover must be preserved.
- The seepage water flowing out at the main dam has to be collected.
- The tailings pond should be replanted. The surface of the pond should be adopted to the former site morphology.

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