

Regulatory Actions to Improve the Management of Uranium Mining Waste in France - 11070

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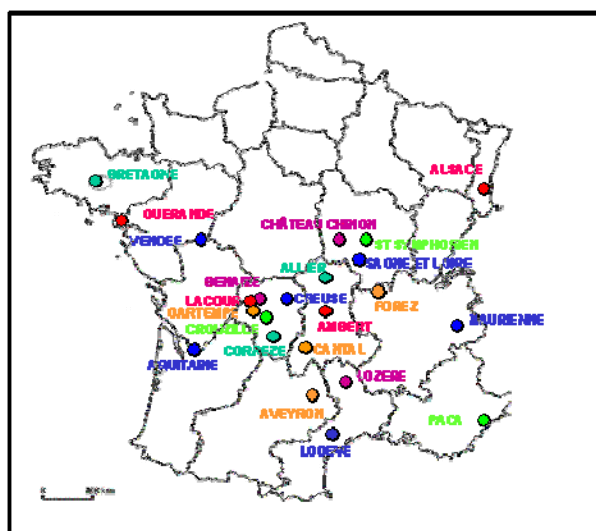
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ABSTRACT

Uranium mines were worked in France between 1948 and 2001, producing 76,000 tons of uranium. Exploration, mining and processing activities were carried out on about 210 sites in France, mainly operated by AREVA, while ore was processed in 8 plants only. The management strategy currently used for the waste is in-situ management, given the very large quantities produced and provided that steps are taken to mitigate the long-term risk.

The uranium mining waste is covered by the *National Management Plan for Radioactive Materials and Waste (PNGMDR)*, created by the 2006 Planning Act. Regarding uranium mining waste, this plan has instituted a R&D program aimed providing an appraisal of the long-term impact of disposal sites for uranium tailings and the implementation of strengthened radiological monitoring program on those sites.

Concurrently with the PNGMDR, it is also important to mention that the Ministers of Environment and Health, jointly with ASN, have decided in 2004 to institute a pluralistic expert group called GEP on Limousin uranium mines. The group proposes recommendations for long-term management. Moreover, in addition to the PNGMDR, the Ministry responsible for sustainable development and ASN jointly defined in a circular dated 22 July 2009 an action plan.



Uranium mining sites in France

INTRODUCTION

Uranium mines were mostly operated in France by AREVA from 1948 to 2001, and produced 76,000 tonnes of uranium. Exploration, mining and processing activities were conducted on about 210 sites disseminated throughout France, while ore was processed in only eight plants. Given the very large volume of waste involved, the current strategy is *in-situ* management, provided that adequate steps are taken to mitigate the long-term risk.

This paper describes, from a regulatory body's point of view, the French uranium-mining context and the ongoing actions to improve the long-term management of uranium-mine waste in the country.

THE CONTEXT OF URANIUM MINES IN FRANCE

The uranium mine workings produced two categories of products:

- static or dynamic processing residues, which are the products remaining after extraction of the uranium from the ore. Such residues correspond to process waste (as defined by the Environment Code);
- mining waste rock, comprising the soil and rock excavated to access the minerals of interest. The waste rock with an average uranium content corresponding to the characteristic natural background level is differentiated from the barren rock consisting of the mineralised rock excavated when working a field, but which has insufficiently high content to allow processing at an economically acceptable cost.



Mining site in Limousin (France)

The processing residues can be divided into two categories, with different specific activity levels:

- low-content ore (about 300 to 600 ppm) with a total average specific activity of 44 Bq/g (including about 4Bq/g of radium 226). These residues, produced by static leaching (about 20 Mt), are placed either in stockpiles, or in open-cast mines, or used as the first covering layer in dynamic processing residue disposal sites;
- ore with a high average content (about 1‰ to 1% in French mines) having a total average specific activity of 312 Bq/g (including about 29 Bq/g of radium 226). These residues, produced by dynamic leaching (about 30 Mt) are either placed in former

open-cast mines, sometimes with an additional dyke, or in pools with a surrounding dyke, or behind a dyke damming a thalweg.



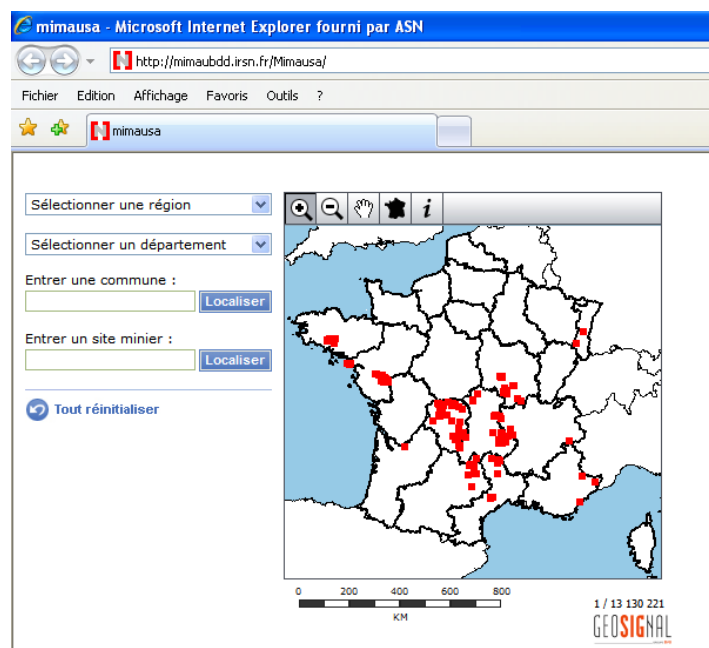
Uranium mine in France

In France, the processing residues account for 50 million tons spread over 17 disposal sites, regulated as installations classified on environmental protection grounds.

The national inventory of uranium mining sites is a part of the “MIMAUSA” (History and impact of uranium mines: summary and archives) programme, under the supervision of the Ministry in charge of Ecology. ASN is part of the steering committee for this programme.

The inventory is available on the website www.irsn.fr and an e-mail contact address (mimausa@irsn.fr) was created at the end of 2007. An updated version of the MIMAUSA inventory (version 2, September 2007) was published on 4 December 2007.

The next step is to set up a MIMAUSA Internet application for the Government’s departments and for the public.



The MIMAUSA website

ACTIONS TO IMPROVE THE MANAGEMENT OF URANIUM MINING WASTE

The National Management Plan for Radioactive Materials and Waste PNGMDR

Uranium-mine waste is covered by the *National Management Plan for Radioactive Materials and Waste (PNGMDR)*, which was created by the *2006 Planning Act*. With regard to such waste, the Plan instituted an R&D programme aimed at providing an appraisal of the long-term impact of disposal sites for uranium waste and the implementation of a strengthened radiological-monitoring programme on those sites.



The PNGMDR

For the French Nuclear Safety Authority, which is in charge of the implementation of the PNGMDR in addition to the control of radiation protection, the management of uranium-mine tailings encompasses four main stakes:

- the long-term radiological impact of the sites;
- the survey and control of the sites;
- the dissemination of the mining waste rock in the public domain, and
- consultations and dialog with the public.

The pluralistic expert group GEP

Concurrently with the PNGMDR, it is also important to mention that the Ministers of the Environment and Health, jointly with ASN, have decided in 2004 to institute a pluralistic expert group (GEP) on uranium mines located in the Limousin area (center of France). The group was notably in charge of participating, with the French Institute for Radiation Protection and Nuclear Safety (IRSN), in the assessment of AREVA's decennial environment review of Limousin uranium mines. The final report of the group, which was issued in 2010, formulates recommendations for long-term management.



Press conference on September 17 2010

From left to right

The President of GEP, the DG of the minister of ecology, the DG of ASN

The GEP sets out six main areas of improvement, within which the GEP makes 15 major recommendations addressed to the public authorities, the owner and all the stakeholders concerned. These recommendations are:

- to renovate and clarify the institutional and legal framework for the management of former mining uranium sites.
- To promote efforts directed at the improvement of knowledge on the sites; to continue the studies and research and to broaden their scope.
- To reinforce the relevance of impact evaluations, in particular extending them to ecosystems; to replace public exposure in the public health risks.
- To develop surveillance systems at the sites and the zones potentially located under their influence.
- To extend the effort of refitting in order to put in place, as of today, systems that are as robust as possible for the long term, where the risks justify it.
- To continue the implementation of the principles of information and participation to make them the drivers of a truly sustainable management system for the sites.

Following this report, the French government will set up a specific committee in charge to review the recommendations and to propose and action plan to implement them.

The joint Ministry in charge of Sustainable Development and ASN circular

Moreover, in addition to the PNGMDR, the Ministry in charge of Sustainable Development and ASN jointly developed in a circular dated 22 July 2009 an action plan detailing the following four areas of work:

- controlling the former mining sites;
 - o all mining sites have been inspected in 2010.
- improving the understanding of the environmental and health impacts of the former uranium mines and their monitoring;
 - o following AREVA's studies, ministerial orders have been prepared.
- waste-rock management with a view to achieving a better understanding of its uses and reducing its impacts, if necessary;
 - o an inventory is being prepared by AREVA and will be assessed by the authorities.
- improving public information and dialog with the population.

- o Notices are in place on each site and all the surveillance data are available on the website jointly prepared by ASN and IRSN <http://mesure-radioactivite.fr>



The national network website

CONCLUSION

In conclusion, major actions to improve the management of uranium-mining tailings are continuing in France, with the goal to achieve a lower radiological impact on the population living in the vicinity of the shut-down uranium mines. All these actions will be implemented after being discussed by all the stakeholders.