Groupe d'Expertise Pluraliste

A pluralist expertise approach to the management of closed uranium mining sites in France

The Groupe d'expertise pluraliste (GEP)

IAEA Conference - Astana, Kazakhstan, 18-22 May 2009

Yves Marignac - GEP Coordinator

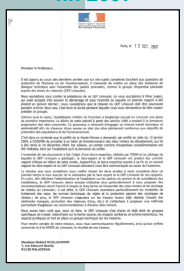
STATUS OF GEP AND ITS WORK

- **GEP at a glance**
  - Commitment, organisation and means
- **Scope**
  - Global approach and main issues
- **Work on transfers to the environment**
  - Overview and focus on some specific studies
- **Work on health and environmental impacts**
  - Overview and focus on some specific studies
- **Work on regulatory and long term issues**
  - Overview and focus on some specific studies
- **"Transverse" issues and generalization**

GEP'S COMMITMENT

1ère lettre mission
fin 2005

2ème lettre mission
fin 2007



A global commitment (mid 2006-end 2009)

- **Contribute to the technical analysis** of documents produced by AREVA (BDE) and their third expertise by IRSN
- **Advise on management options:**
  - Recommendations to reduce the impacts of mining sites in Limousin
  - Mid to long term management strategies, including a methodology for generalizing to all French uranium sites
- **Participate in the information of local players and the public**

A part of a broader process

- **Existing remediation work and production of a doctrina**
- **Local authorities' work,** especially in Limousin
- **Link with the implementation of the 2006 law** on sustainable management of radwaste and nuclear materials

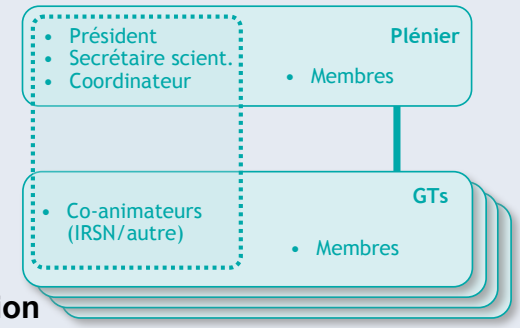
SPECIFICITY OF GEP

- **Groupe d'expertise pluraliste:**
  place for **technical dialogue** bringing various experts together
- **Relevance**
  - contribute to solve **complex issues** with high **societal stake**
  - need to embed **contradictory analysis** / build **shared understanding**
- **Composition**
  - the **operator** in responsibility to demonstrate safe risk management
  - **public expert bodies** committed to develop a "critical analysis" of operator's work
  - concerned **NGOs**, as well as **independent experts** producing their own analysis of the operator's and public expert bodies' work
- **Role**
  - ensure a **broader and deeper analysis** based on existing expertise
  - develop **advice** and **recommandations** to the concerned authorities showing areas of consensus and potentially diverging views
  - produce **information** to local information commissions and any institution / process involving participation of stakeholders

COMPOSITION OF GEP

Pluralistic composition *and* organisation

- **Diversity in two ways:**
  - Pluralism of competencies
  - Pluralism of points of view
- **Over 40 experts involved**
  (> 30 in plenary + working groups)
- **Working groups and principle of pluralist organisation**



Public Institutes and Administration	NGOs and independent	Industry	Foreign experts
- IRSN, InVS, INERIS, GEODERIS - Universities - Authorities	- Independent Experts - GSIEN, ACRO - Sources Rivières Limousin, Association Sauvegarde Gartempe	- Areva NC	- IAEA - UK, Switzerland, Belgium, Luxembourg, Israel
16 experts	**5 experts**	**5 experts**	**6 experts**

GEP'S MEANS

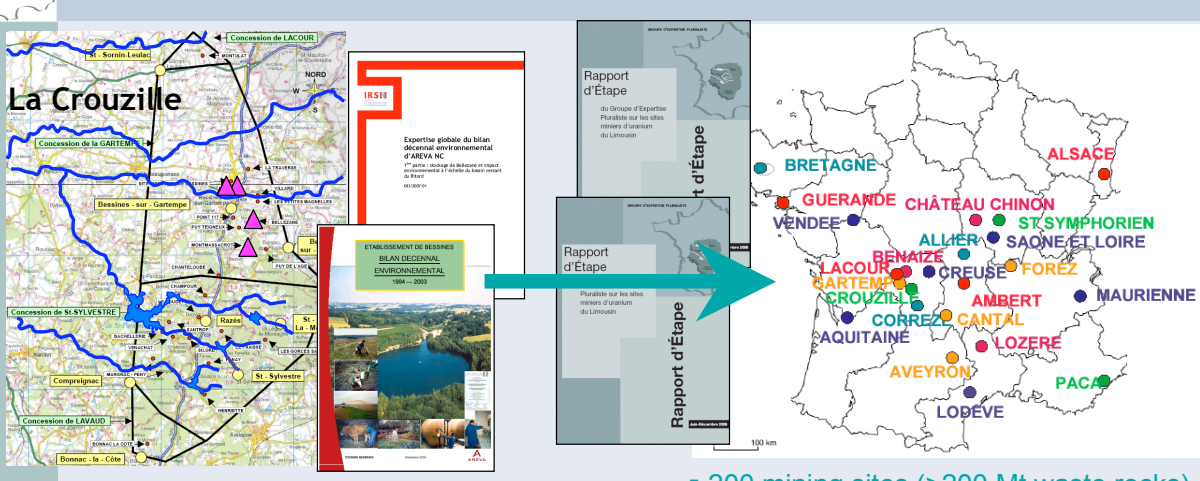
Convenient means

- **Availibility of technical expertise**
  - Contribution of IRSN (third expertise...), contribution of AREVA (BDE...)
  - Access to other studies and potential for complementary studies commissioned
- **Financing Protocol**
  - Support to NGOs / independent / foreign expertise
  - Secretary and administrative support
  - Participation in exchanges at local, national and international levels
- **Working rythm**
  - Between 25 et 40 meetings per year (from plenary to small, specific)
  - Between 5 and 10 presentations given (local, national, international)

Année	Plénier	GT1	GT2	GT3	GT4	Local	National	Internatl
2006	4	3	3	**2**	0	0	0	0
2007	8	4	4	**6 (+ 2*)**	1**	2	1	2
2008	6	6	7 (+ 6*)	**7**	6***	3	1	5

* Réunion restreinte, ** Commune avec le GT1, *** Dont une commune avec le GT2

GEP'S GLOBAL APPROACH



- 24 mining sites (58 Mt waste rocks)
- 4 tailings disposal sites (20 Mt)

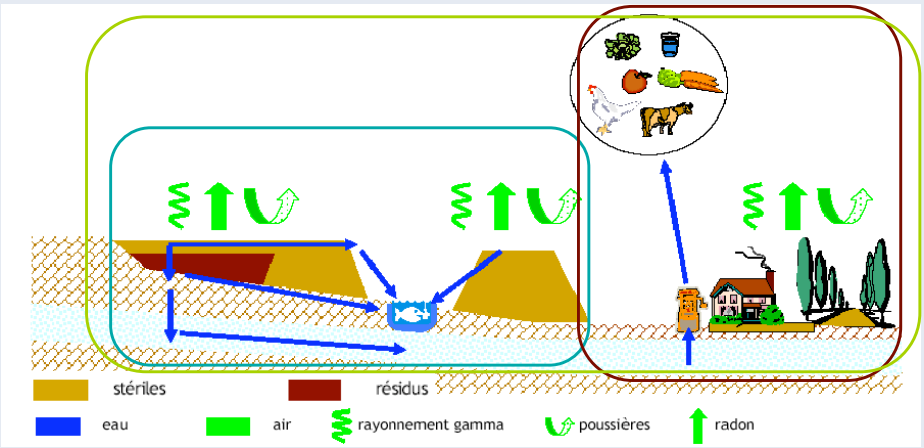
- 200 mining sites (>200 Mt waste rocks)
- 17 tailings disposal sites (52 Mt)

Detailed analysis of sites in one Mining Division (La Crouzille)
• understanding the systems, assessing the status, identifying the key points for evolution

Step-by-step approach towards methodology and generalization
• predicting the evolution of the sites based on the current status
• elaborating a global assessment / management approach applicable to all sites

GEP'S ORGANISATION OF WORK

- **Transferts of radioactive / chemical materials from the sites to the environment**
- **Exposition of flora, fauna and populations, health and environmental impacts**
- **Regulatory framework, socio-economic context, and long-term concerns**



TRANSFERS TO THE ENVIRONMENT

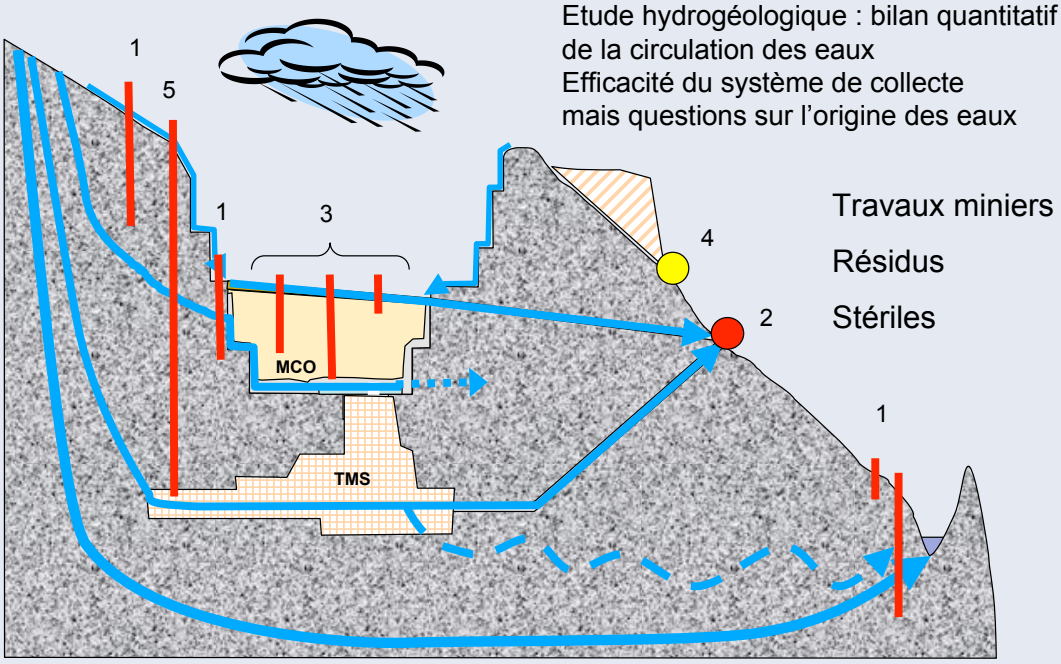
An overview of WG1's work

- **Themas**
  - Status of remediation on sites
  - Status and evolution of transfers to the environment
- **Identification of mechanisms in the physical milieu**
  - Sources of radioactive and chemical contamination
  - The transfer modes from the sites to the environment (water, air...)
- **Analysis of the systems on the sites**
  - mining works
  - waste rocks piles
  - mill tailings disposals *(Bellezane)*
  - water collecting and treatment
  - deposits of contaminated sediments
  - re-used waste rocks

FOCUS : GEOCHEMICAL ANALYSIS OF WATERS

First step: hydrological study of Bellezane (report #2)

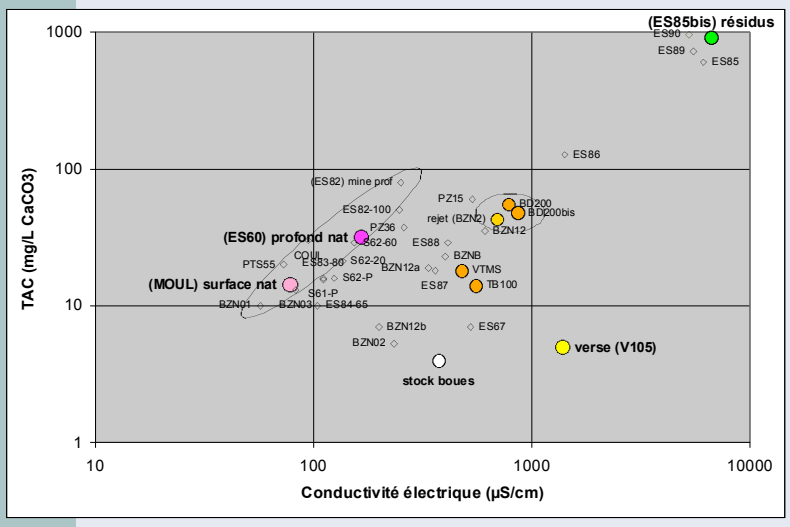
Etude hydrogéologique : bilan quantitatif de la circulation des eaux
Efficacité du système de collecte mais questions sur l'origine des eaux



FOCUS : GEOCHEMICAL ANALYSIS OF WATERS

Characterising "water poles"

Implementation of a geochemical study (Ecole des Mines de Paris for AREVA)
Demonstration of "poles" characterizing the influence of the various types of water (geological milieu, waste rocks, underground mining works...)
Main result: no influence of mill tailings observed in other waters than those collected by main gallery for treatment (galerie BD200)



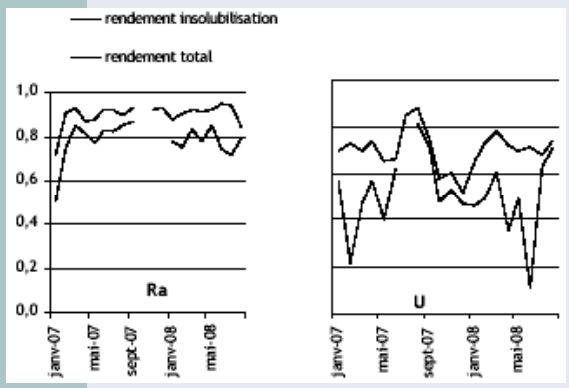
Methodological result:
Two steps approach
- relevant,
- applicable to other sites

Pending issue:
Capacity to develop a model for predictive analysis (including altered situations)
—> Ongoing study

FOCUS : WATER TREATMENT

Analysis of the efficiency of treatment (Augères)

- **Recommendation of complementary study on discharges (report #2):**
  Completing the analysis of the efficiency of treatments by the analysis of the physical/chemical form of uranium and radium



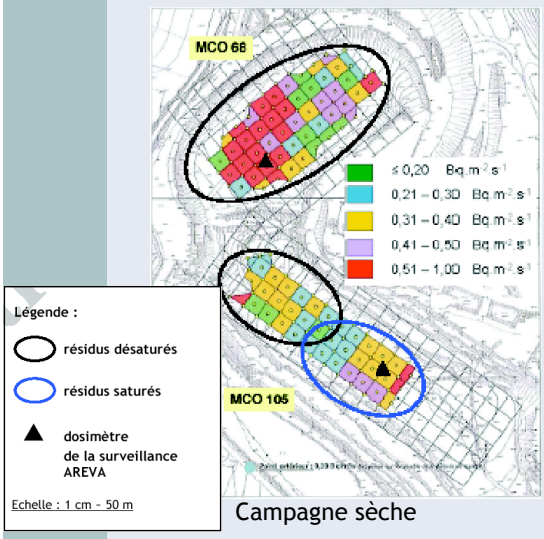
Rendement d'insolubilisation et rendement total pour le radium et l'uranium au niveau de la station d'Augères entre 2007 et 2008

- **Main conclusions (report #3):**
  - Significant reduction of uranium in discharges
  - But incomplete efficiency of the process (50% of uranium particles)
  - Reduction of impacts (marked sediments) needs a supplementary reduction of uranium discharges at the station
- **Open questions:**
  - Evolution of water discharges limits
  - Alternatives to the chemical process for water treatment
  - Time horizon for ending treatment

FOCUS : EFFICIENCY OF COVER

Study on Bellezane cover

❑ **Recommendation of cartography (report #2) :**
Questions about the representativity of monitoring data
on the efficiency of the cover and its behaviour in the mid-long term



Campagne sèche

❑ **Main conclusions (report #3):**
- Cover provides efficient protection against radon and gamma radiation
- Protection is linked to maintaining the quality of the cover over time (plus favorable context in Bellezane)
- Periodical campaigns (cartography) appear more adapted to the monitoring need than continuous ambiant measurement

HEALTH AND ENVIRONMENTAL IMPACTS

An overview of WG2's work

❑ Go beyond health and environmental impact assessement set forth in regulations

1	**Environmental Impact** *radiological and chemical*
2	**Health Impact** *radiological and chemical*
3	**Health monitoring**

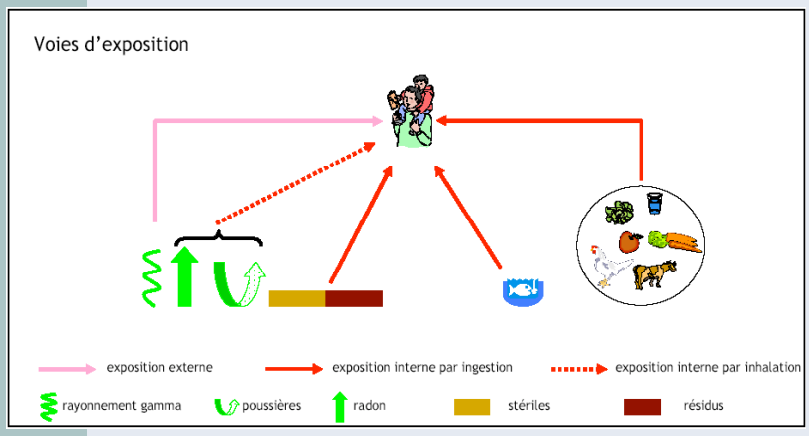
- First application of an innovative method to evaluate impact of radioactive substances on local ecosystems
- Feasibility of quantitative evaluation of radioactive risk other than additional effective dose to reference groups
- Health monitoring: reviewing public health surveillance
- Development of assessment of the chemical risk

❑ Develop capacity to assess evolution of impacts according to various scenarios

DOSIMETRIC IMPACT ASSESSMENT

Revised methodology

- Critical analysis of the method applied for the assessment of added effective dose (based on the definition of reference groups)
- Proposals to develop an alternative method based on scenarios



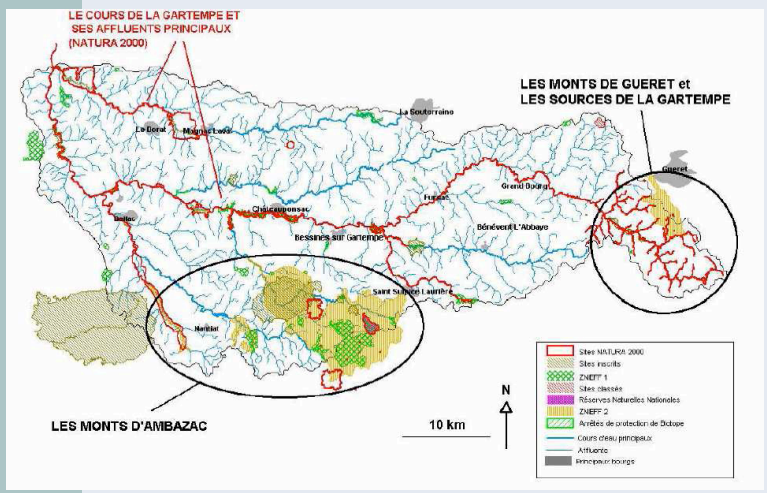
- Reference (usual life habits)
- "Autarcic" agriculture
- Fishery
- Leisure
- Waste rocks re-use
- Sites re-use (new economic activities)

- Calculation ongoing, results will be used also for long-term scenarios

PROTECTION OF THE ENVIRONMENT

Environmental impact assessment / monitoring

- Test of new methods to assess radiological and chemical impacts on ecosystems (step by step from screening to detailed site-specific)



- Recommendations on existing / specific monitoring tools:
  - Protection of endangered species / biodiversity
  - Protection of areas of communautary interest
  - Protection of hulid zones
  - Management of existing ponds and improvement of the ecologic quality of water systems
  - Protection of landsape

REGULATORY FRAMEWORK AND LONG TERM

An overview of WG3's work

- **Link between technical analysis and:**
  - Changing priorities in the area of environmental protection
  - Sustainability of rehabilitation works
  - Long term liability (transfer from the operator to the state)
  - Stakeholders involvement
- **Past and current investigations:**
  - Legal qualification of the materials and sites
    Discuss the most appropriate implementation
    of the regulatory framework for long-term management
  - Long-term aspects of monitoring
    Timescale and scenarios to consider
    Move towards less active monitoring and features

WORKING PRIORITIES

Themes identified by WG3 in its first stage

Four themes of "organisational" nature	
✓ 1- Juridical status of materials and sites	**Cf. report #2**
✓ 2- Responsibility over sites and memory	**Under discussion**
3- Financing the long term	**Under discussion**
4- Control, expertise, stakeholders involvement	**Under discussion**
Four themes of more "operational" or technical nature	
✓ 5- Scenarios to take into account (hazards, timeframe)	**Cf. report #2**
✓ 6- Scope and nature of «active/passive» monitoring	**Under discussion**
7- Long term impact on health	**Link with WG2**
8- Long term impact on the environnement	**Link with WG2**

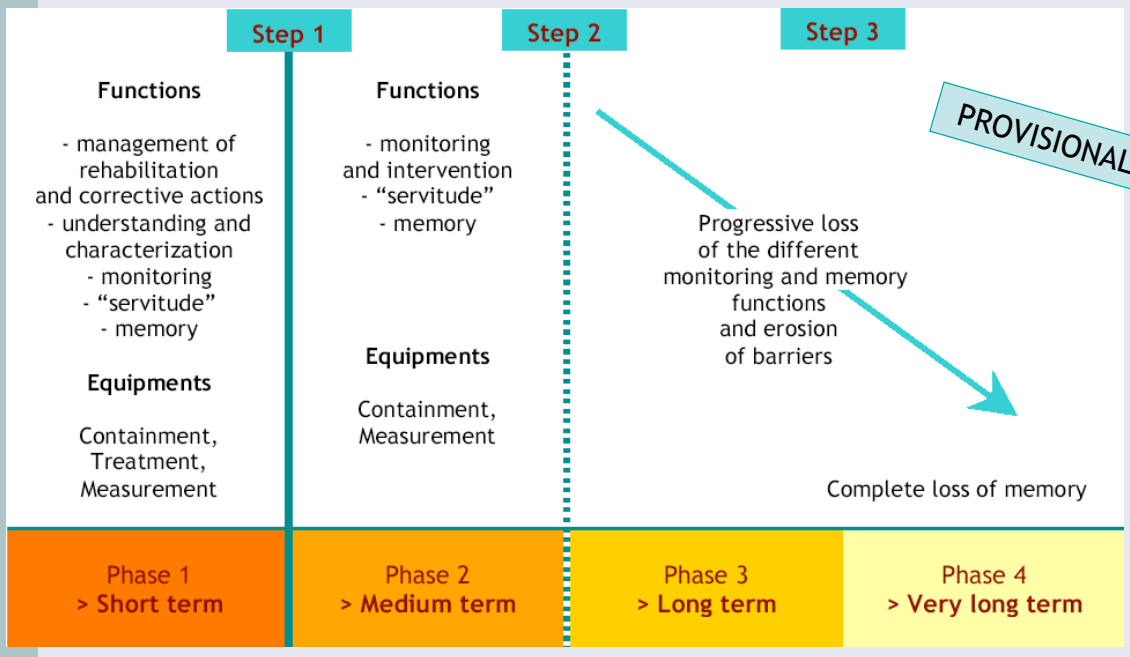
FOCUS: LONG TERM VIEW

Comparison with existing long term views

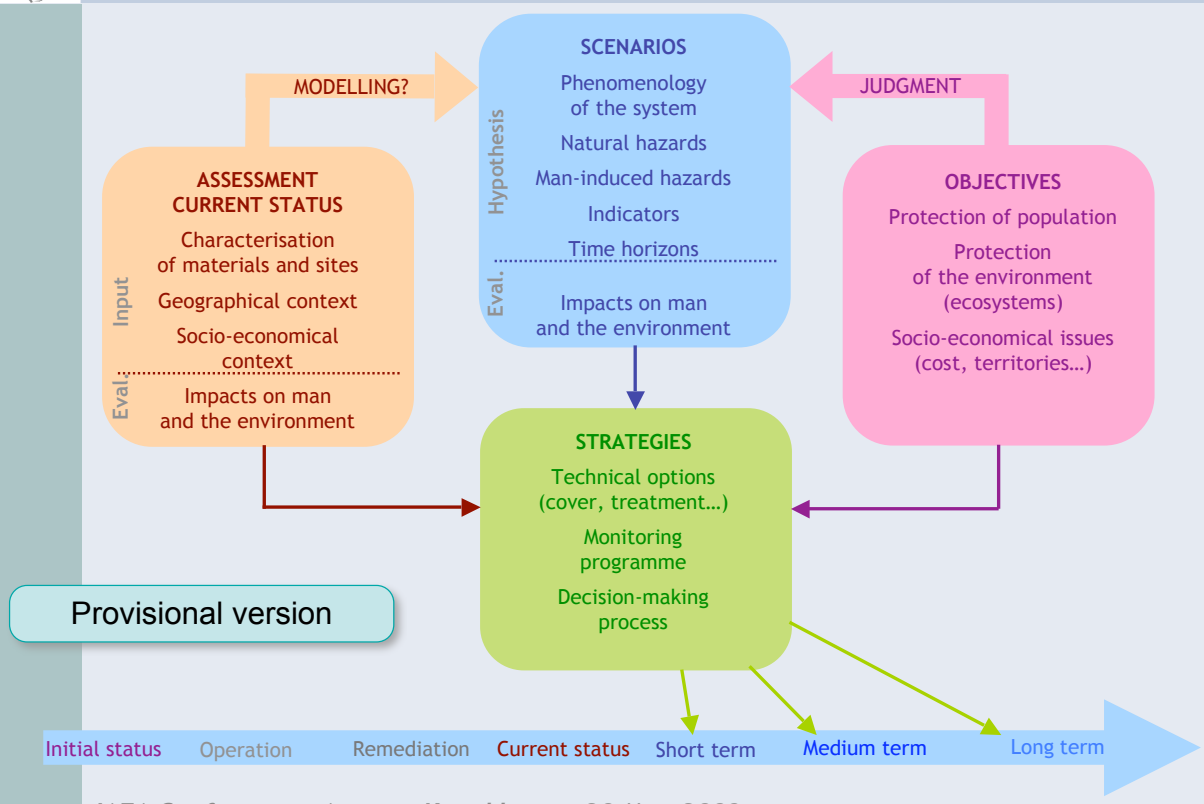
		GT3 Discussion	Doctrine DPPR (1999) Mill tailings	RFS I.2 (1984) Surface disposal (SL-LLW)	Guide sûreté (2008) Geological disposal (LL-IHLW)
		Existing site	Existing site	Conception	Conception
A few years	0	Current situation	End of first remediation	Opening	Future opening
	10 y	***Operation and monitoring+***	***Active monitoring***	***Operation***	***Operation***
A few decades	30 y	Transfer to public admin. ?		Closure	
	50 y	***Monitoring***	End of treatment		Closure
	100 y		***Passive monitoring***	***Monitoring***	***Passive safety***
A few centuries	300 y	Loss of memory?	Possible decrease of containment quality	Max. deadline end monitoring	
	500 y	Decrease of quality of some containment components ?	Loss of memory	***Lifting site constraints***	Loss of memory (human intrusion becomes possible)
	1.000 y		Certain decrease of containment quality	Possible end of efficiency of built containment	
	10.000 y	???	***Not guaranteed monitoring***		Term of demonstration of geological stability

FOCUS: LONG TERM VIEW

Evolution of tailings disposal sites through time



GLOBAL APPROACH



ONGOING WORK

Developing "transverse" work (between WGs)

- **"Surveillance"**
  - What is at stake: evolution of the sites, of their potential impacts...
  - Découpage de la démarche site par site en phases de compréhension du fonctionnement, de démonstration de l'efficacité, puis de surveillance "routinière"
  - Identification des indicateurs de l'évolution, objets pertinents de la surveillance
- **Water discharges (collecting / treatment / limits...)**
  - Capacity to develop predicting models for the evolution of waters on sites?
  - Feasibility of adapting limits to better accounting for the whole of radionuclides and the specific impacts on receiving areas
  - Status of alternatives to current chemical treatment
  - Pending issue of perennial treatment vs. evolution of waters / limits
- **Long term protection**
- **Re-used waste rocks (under discussion)**

PREPARATION OF FINAL REPORT

Aim for final report

- **Deadline: end 2009**
- **Synthetic report**
  - Based on sites specific detailed studies carried on
  - Developing a global approach for assessing the status and management options on existing sites
- **An operational objective**
  - Recommendation directly applicable (already in interim reports)
- **A willingness to pursue at least for information**

Projet de plan de rapport final

Introduction
Rappel des objectifs / lettres de mission
Objet du rapport
Champ d'application du document

1. Contexte
1.1. Histoire des mines en Limousin
1.2. Objectifs de la gestion des sites

2. Situation actuelle : état des lieux et impacts
2.1. Etat des lieux (sources et flux)
2.2. Contexte socio-économique
2.3. Evaluation des impacts
2.4. Transposition de la méthode à d'autres sites

3. Situation à long terme : évolutions et impacts
3.1. Scénarios d'évolution des sites
3.2. Evaluation des impacts
3.3. Transposition de la méthode à d'autres sites

4. Gestion des sites miniers
4.1. Options techniques
4.2. Surveillance
4.3. Gouvernance

5. Synthèse des recommandations du GEP

INTERNATIONAL CONCERN

International Perspective

- **International return of experience**
  - Large REX… but very few specific lessons regarding long term issues
  - Less shaped international doctrina than expected
  - Need to connect with evolution of radiation protection concerns
- **International openness**
  - Participation of IAEA and foreign experts
  - Regular exchanges with WISMUT
    - Different in size and context
    - Convergent in general options, with some technical differences
    - Confronted to similar issues mostly linked to long term
    - Step-by-step discussion from the comparison of general approaches down to specific issues
- **Interest in further input from international experience**

Interim "Balance Sheet"

❑ Operational

- work in progress, published in interim reports
- first operational and local recommendations implemented
- ongoing dialogue with local commissions in Limousin
- website on-line: www.gep-nucleaire.org

❑ Added value

- playground for broader technical and scientific dialogue
- multiple approach, enhanced methodology
- interlinking technical and societal analyses to address long term issues

❑ Challenge / final delivery (end of 2009)

- from analysis of current situation to prospective options
- from site-specific analysis to a global approach
- from experts discussion to relevant recommendations

Thanks for your attention

More information:

Site web:

www.gep-nucleaire.org

Contact:

Robert Guillaumont - President
E-mail: **robert.guillaumont@wanadoo.fr**
Didier Gay, IRSN - Scientific Secretary
Tel. +33.1.58.35.98.27
E-mail: **didier.gay@irsn.fr**
Yves Marignac, WISE-Paris - Coordinator
Tel.: +33.6.07.71.02.41
E-mail: **yves.marignac@wise-paris.org**