

The 2017 methodology update

The April 19th 2017 ministerial Note reminds the basis of the French contaminated land policy and presents what has changed since the former 2007 methodology. Its frameworks are now regrouped in only one guidance document. An additional all-public introductory document provides a history of almost half a century of national policy implementation.

The main principles of the French « contaminated land management » are reaffirmed, particularly site remediation taking into account current and future land-use. Priority is on eliminating the source of pollution, according to the precaution and reparation principle.

This methodology promotes the use of the Best Available Technologies (BAT). It considers now-operative investigation tools and new methods stemming from research and development. Practical tools for decision-making support have been developed, as for example the mass balance that consists of quantitative analysis of the pollutant masses (within the Remediation Plan).

Following the remediation plan, a final step of remediation engineering completes the decision-making process. It comprises of a clean-up effort design plan and the planned follow-up until completion and reception stage. A specific chapter on the remediation of former mining sites has been added.

The financial demonstration becomes a key element of the management plan considering environmental benefits. It is reminded that action can only be taken following a cost benefit analysis demonstrating their feasibility at an affordable cost. Technical, socio-political, juridical and regulatory criteria can also need to be considered.

These changes in the methodology reinforce the founding principles of the French « contaminated land management », in particular by considering as a key element the multiple stakeholders interests.

FOR MORE INFORMATION, VISIT (in French):

Ministry in charge of environment - Sites et Sols Pollués (contaminated land):
<http://www.ecologique-solidaire.gouv.fr/sites-et-sols-pollues>

Methodological and technical information:

BRGM - InfoTerre - Sites et Sols Pollués (contaminated land):
<http://ssp-infoterre.brgm.fr>

Regulation information:

Légifrance:
<http://www.legifrance.gouv.fr>

April 19, 2017 ministerial Note:
http://circulaire.legifrance.gouv.fr/pdf/2017/04/cir_42093.pdf

LOI du 24 mars 2014 pour l'accès au logement et un urbanisme rénové (ALUR)
<http://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT00002872256>

INERIS - Aida:
<http://aida.ineris.fr>

Data base:

BASIAS:
<http://www.georisques.gouv.fr/dossiers/inventaire-historique-des-sites-industriels-et-activites-de-service-basias#>

BASOL:
<http://basol.developpement-durable.gouv.fr>

SIS:
<http://www.georisques.gouv.fr/les-secteurs-dinformations-des-sols-sis>



Brownfield (source: Brgm)

The National Policy for managing contaminated land

The national policy for managing contaminated land relies on the management of human health and environmental risks taking into account land use. On this principle, the national methodology applies to all sites that potentially present issues of pollution in soil or other media. Amended in 2017, it reinforces previous frameworks that are now acknowledged by professionals. Both the methodology and the frameworks share the following principles:

- ◆ A distinction between i) current and future pollutions to be managed according to the principle of precaution and reparation, and ii) the historical pollutions to be managed according to the principle of land use,
- ◆ An assessment of the risks, based on the actual uses, on the exposure media characterization and remediation thresholds reflecting national objectives for public health,
- ◆ The “specificity” principle implying an assessment on a case-by-case basis, as close as possible to the site’s reality,
- ◆ Finally, the central role given to technical feasibility assessments and to the well-argued financial demonstrations.

This policy for managing contaminated land according to land use, adopted by France, as many other countries in the world deals with historical contaminations, including those from former industrial activities. However, it does not allow in any circumstance current activities to pollute and rely afterwards on a management according to its use. When such activities fall under the regulation for facilities classified for environmental protection (ICPE), they must fulfil the planned preventive compulsory requirements. In that case, all detected pollution must lead to measures to repair damages and get back to its previous environmental state.

In some countries methodologies for managing (potentially) contaminated land rely on the use of soil generic guiding values. Such approaches however, can be adapted to take into account particular cases for which costs or technical feasibility pose an issue to reach targeted guiding values. The French methodology directly takes into account those kind of issue as it does not rely on soil guiding values. It also relies on the specificity principle, comparing site’s exposure media quality with nearby off-site media that are not impacted by the pollution. This comparison must be reinforced by data from the pedo-geochemical background.

The methodological guidance presents a range of specific tools: Conceptual Model, Assessment of the State of Media Quality (*Interprétation de l’Etat des Milieux—IEM*), Remediation Plan (*Plan de Gestion—PG*)... It is recommended to carry out IEM or PG in a progressive manner, i.e. when acquiring data and producing results. The identification of the origin and of the extent of the pollution must be based on reliable desktop studies, site investigations and assessments. Direct measures from *in situ* investigations for characterising exposure media quality is preferred to computer modelling.

Human health protection requires professionals with strong knowledge in the state of the art and constrains to choose the best options for remediation amongst a wide range of material and technical possibilities. There is therefore a real challenge for project managers to find consultants and sub-contractors with relevant expertise and skills.

Tools to keep the memory of pollution

Managing contaminated land compels to keep a memory of the former pollutions. The BASIAS database was the first inventory to be put in place in the 90s, listing former industrial sites and service activities. The second inventory, BASOL, created in 2000, is a database of contaminated or potentially contaminated sites that need an intervention from the Authorities.

In 2014, the ALUR legislation is a new step in compiling information on former pollution, by enforcing the creation of geographic sectors with soil information (Soil Information District— *Secteurs d’Information sur les Sols—SIS*), allowing a better access to information on polluted land known to the Authorities.

Direction générale
de la Prévention
des Risques

Bureau du Sol et
du Sous-Sol

French National methodology for managing contaminated land



Source: Brgm



MINISTÈRE
DE LA TRANSITION
ÉCOLOGIQUE
ET SOLIDAIRE

Ministère de la Transition écologique et solidaire

Tools for managing contaminated land

Characterising the state of a site's media

The first and indispensable stage is to establish a factual assessment of the state of the site's media, in order to understand the relations between **sources of the pollution, migration pathways and receptors that must be protected** (people, water resources...).

This approach, i.e. **“Conceptual Model” development**, relies first on gathering of information from historical records and other possible sources, **media vulnerabilities assessment (Etude de vulnérabilité des milieux)**, **site reconnaissance**, and then on site investigations concerning relevant media. Good quality studies will contribute to the development of a solid and robust conceptual model, so it can orient remediation actions considering relevant receptors and the current and future uses.

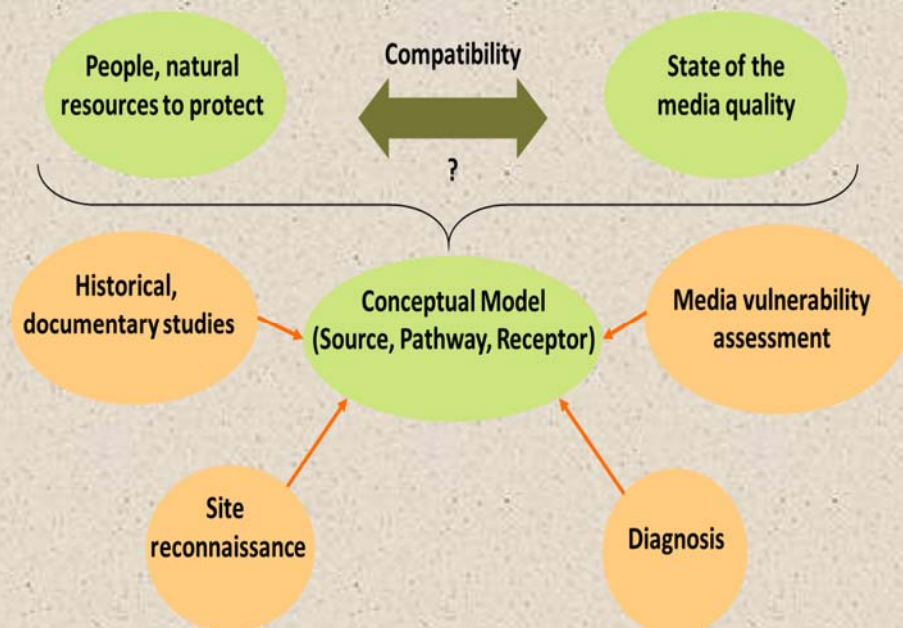
The model ought to be revised continuously as new information is acquired.

Assessing the state of a site's media (IEM)

The **Assessment of the State of Media Quality (“Interprétation de l'Etat des Milieux” approach—IEM)**, helps to evaluate for a given site if there is compatibility between the current state of its environmental media quality and its current land use (e.g. residential, single dwellings with or without crawlspace, playgrounds, vegetable gardens, agriculture, groundwater uses).

The results of the investigations (**Diagnostic**) are compared to different values provided by the methodology (values chosen depending on situations).

Using these results, the IEM can identify exposure media that do not need any particular attention, and media in need of actions that may be simple, or lead to a **Remediation Plan (Plan de Gestion—PG)**.



Interprétation de l'Etat des Milieux (IEM)

“Assessment of the state of media quality” approach.

Tools for managing contaminated land

Remediation Plan (Plan de Gestion)

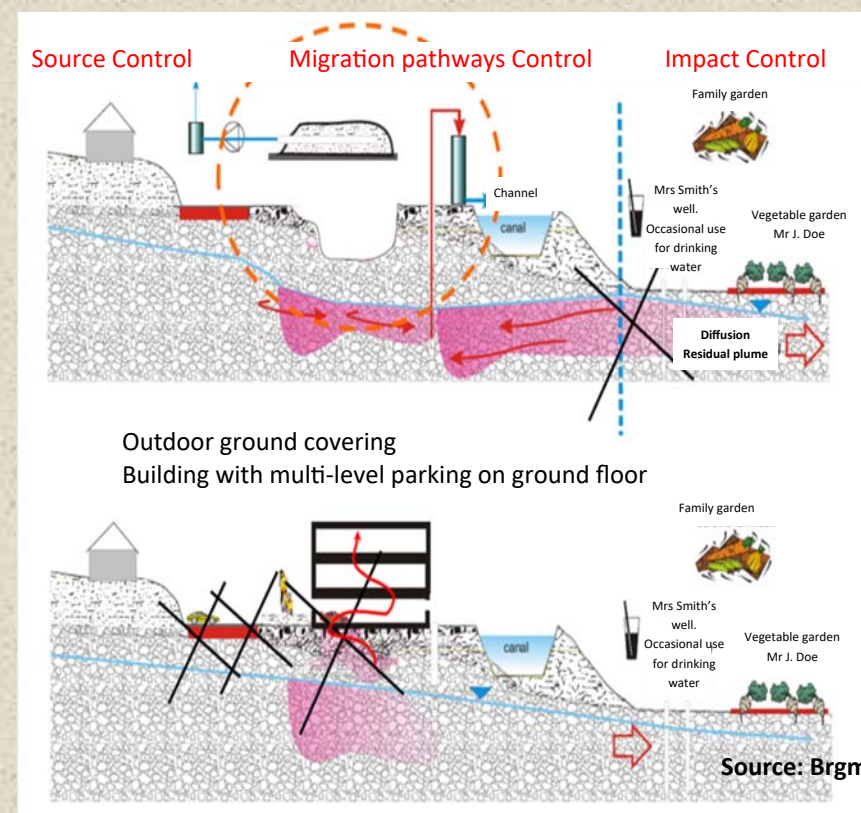
The **Remediation Plan (Plan de Gestion—PG)** can be implemented for different situations for which it is still possible to **take an action on the environmental media and/or to make changes to land uses** (e.g. cessation of activity for a site under Regulation for facilities classified for environmental protection (ICPE), rehabilitation of former industrial sites).

As a guiding document, it aims to **establish different scenarios for remediation**. An analysis of residual risk (*Analyse des Risques Résiduels — ARR*) is carried out for the scenarios that do not lead to a total elimination of the sources of pollution.

In this context, the methodology provides new tools that allow to:

- ◆ Have a better **delimitation of the sources** of pollution and hot spots using cartographical interpretation and mass balance calculations;
- ◆ **Define remedial targets**, considering the pollutant and the media characteristics, the media quality objectives, and the incapacity for the soils to release pollutants, that could result in a significant degradation of the groundwater quality;
- ◆ Have well-founded **cost benefit analysis (Bilan « coûts-avantages »)** using criteria that are objective, clear, and well-argued;
- ◆ Develop well-argued **financial demonstrations** for each of the possible solutions (iterative process: remediating whole or part of the pollution);
- ◆ Volunteer at least **two remediation scenarios**, than can be possibly validated by **trials of feasibility and treatability**.

The Remediation Plan should present all of these results, as well as the **monitoring and control programme to be put in place in order to ensure the efficiency of the remediation measures during the remediation works**.



Example of an scalable conceptual model following effective remedial measures (*Modèle de Fonctionnement*).

Tools for managing contaminated land

Engineering works for remediation

This is the **last step of the methodology**. It comprises of two stages: developing the remediation design plan and the follow-up of their implementation.

The **remediation design plan** is built to **secure the remediation projects**. It makes a link between the previous « study » stage and the specifications of the clean-up effort. Feasibility and treatability tests in the laboratory or on-site can also be used to strengthen the selected remediation scenarios.

The expected objectives of the remediation plan are to:

- ◆ Validate the remediation scenarios,
- ◆ Help to scale and dimension the treatment installation,
- ◆ Serve as a basis for preparing the consultation of remediation companies.

After the design stage, comes the implementation stage, where the depollution engineering works includes the **follow-up of the clean-up effort until the reception stage (réception des travaux)**. These controls ensure that the implemented remedial measures are carried out as expected. They are recorded in the construction record (*dossier de récolement*) as well as the work completion report and the clean-up effort validation ARR.



Development on a former industrial site
(Quartier de l'Union - Lille Métropole - Secteur La Plaine Images)
Source: site internet <http://www.lunion.org>
(« La Plaine Images prend son envol » - Project life February 24, 2017)