


GDF SUEZ

The logo for GDF SUEZ is displayed in a bold, dark grey, sans-serif font. The letters are slightly irregular, giving it a modern, industrial feel. Below the text is a horizontal teal-colored bar with a soft, blurred shadow effect, suggesting a three-dimensional object or a shadow cast on a surface.

GDF SUEZ



Decision Support Systems for
Management of Former Gas
Plant Sites



Summary

- Context and needs for environmental decision support systems
- Tools for classification and prioritizing of former MGP sites
 - Prioritizing
 - Ranking of the sensitivity
 - Treatment according to sensitivity
- Tools for definition of rehabilitation objectives for former MGP sites
 - Chemical substances as tracers of gas manufacturing
 - Criteria for environmental compatibility
 - Results
- Conclusions and outlook

Context and needs for environmental decision support systems

- 1990 : Discovery of a tar tanks still containing by-products during works in a former MGP site located near a town center.
- First actions : inventory of the sites
- GDF SUEZ manages about 500 former MGP sites in France
- Needs to classify and to hierarchy these sites
- Needs to define the immediate treatment for all these sites
- Needs to define the rehabilitation objectives before sales transaction, cession or redevelopment of these sites

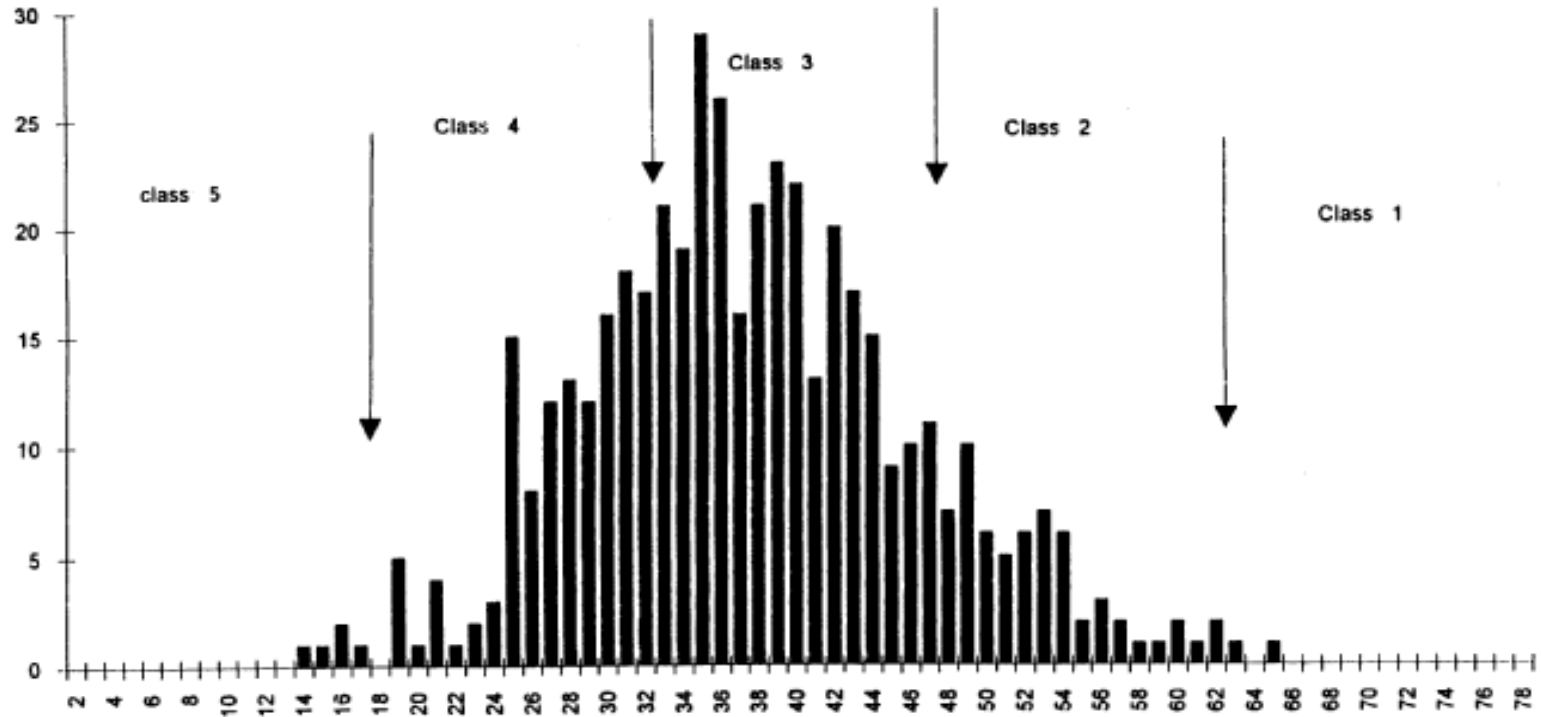
Tools to identify and classify: the prioritizing sheet

17 CRITERIA TO CLASSIFY IN SENSITIVITY THE FORMER MGP SITES

	relative weight
➤ The site and its environment	
• 1 c Accessibility	2
• 1 e Current use	2
• 1 f Uses of sold parcels	2
➤ Risks for the environment	
• 2 f Closeness to water supply well	3
• 2 h Risks of contamination of the plant food chain	3
➤ Population of the site	
• 3 a Presence of population	2
• 3 b Type of population	2

The distribution of sensitivity

The range of scores go from 2 to 78



The treatments according to the sensitivity

Sensitivity	Number of sites	Actions	Period
1 Pronounced	2	Environmental audit + remediation	immediately
2 Limited	61	Diagnosis and appropriate treatment	Under 3 years
3 Small	272	historical study, and location, emptying and filling of any tar tanks	Under 8 years
4 Very small	127	historical study, and location, emptying and filling of any tar tanks	Under 10 years
5 Very small	5	historical study, and location, emptying and filling of any tar tanks	Under 10 years

Tools for definition of rehabilitation objectives for former MGP sites :

The Semi-Generic Study

➤ Why

- Needs to homogenize the level of remediation for all the sites in case of cession and redevelopment
- Needs to give to the authorities reference values in order to agree the implemented remediation.
- To remediate the sites to make them compatible with the intended use
- To avoid unrealistic commitments

The Semi-Generic Study

➤ Specificities

- It was conducted from GDF experiences coming from research works in laboratory and in situ on the former MGP sites.
- This study applies only to MGP sites

Chemical substances as tracers of gas manufacturing

- Five substances are considered :
 - Benzo(a)pyrène, Fluoranthène, Naphtalène (belonging to PAHs)
 - Benzène (family of BTEX)
 - Ferric ferrocyanide from the materials used to purify the gas

- These substances are relevant towards compatibility criteria used in the study

The compatibility criteria and the scenarios of use

➤ Four different criteria are considered :

- Health compatibility
- Olfactory factors
- Possible release of chemicals to groundwater
- Management of excavated land

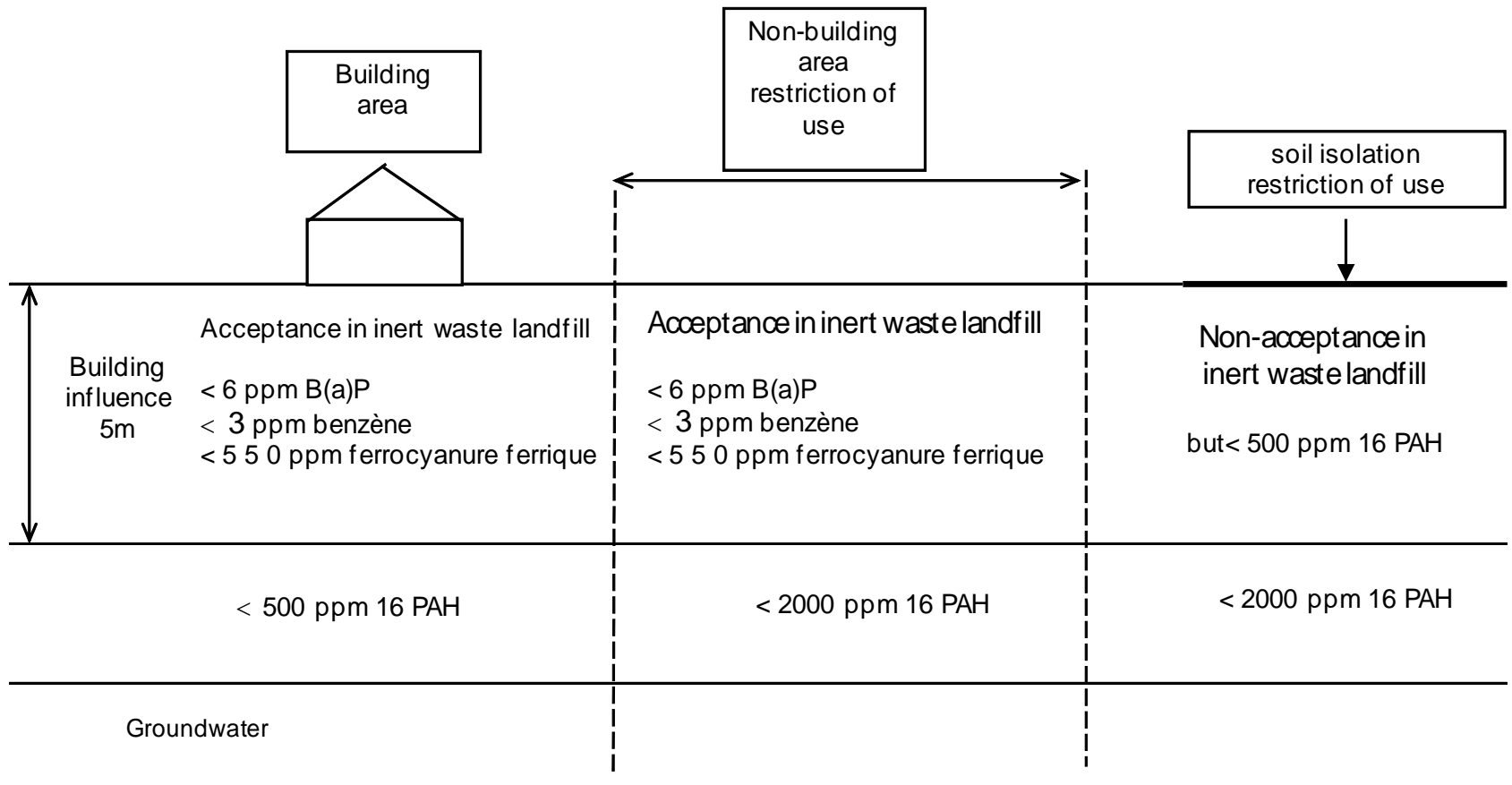
➤ Three scenarios of uses are selected

- Sensitive uses : residential housing, public parks
- Non-sensitive uses: Office, industrial plant, storage, outdoor car park
- GDF corporate uses and own redevelopment needs

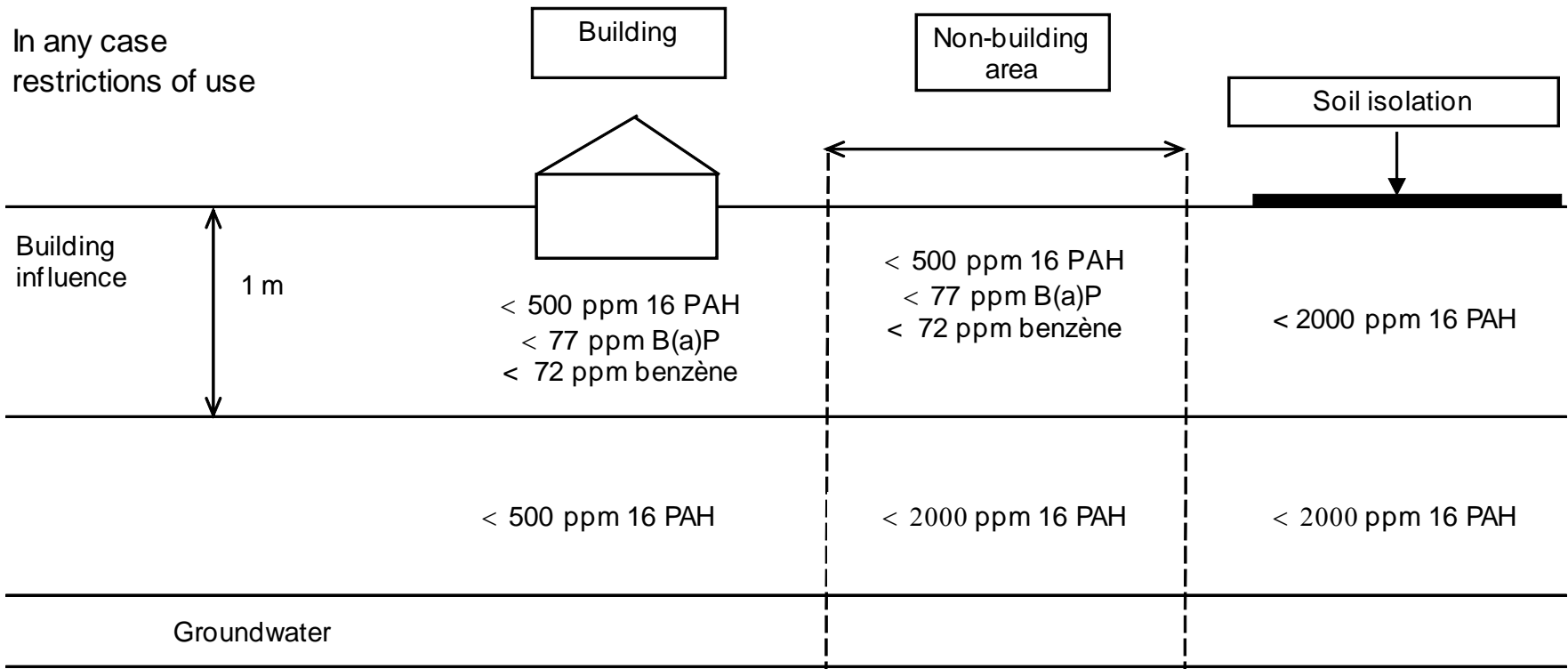
Remediation objectives : summary by criteria

- Health : the objectives depend on substances and scenarios (see following slides).
- Olfactory : 500 mg/kg for the 16 PAHs.
- Release in groundwater : 2000 mg/kg for the 16 PAHs
- Management of excavated land: acceptance in inert waste landfills

Remediation objectives : sensitive uses (residential housing, public parks)



Remediation objectives: non-sensitive uses (Office, industrial plant, storage, outdoor car parks)



Conclusions and outlook

- These decision support tools have been used in the context of the implementation of an agreement with the Ministry of Environment ("Protocol")
- This "Protocol" lasted 10 years and ended in 2006
- Currently, GDF SUEZ is no longer governed by this agreement, and assumes its landowner responsibilities in law
- However, the Semi-Generic Study is always being used to determine the objectives of remediation ensuring health compatibility with the planned use
- This "health harmonized approach" is being updated to reflect changes in national policy on contaminated land and also in Toxicological Reference Value