

# **Estimation of Industrial Polluted Soils**

**Erwan VARILLON, France**

**Key words:**

## **SUMMARY**

Public power is concerned by soil pollution problem since about thirty years. It became a sensible topic and a major stake for industrial companies given the costs they engender. If a regulatory scope is getting down slowly, defining a value for those grounds is a recent preoccupation to which the surveyor can answer. Before considering the estimation in itself, the regulatory context must be studied, to understand the process of depollution.

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## 1. INTRODUCTION

Public power is concerned by soil pollution problem since about thirty years. It became a sensible topic and a major stake for industrial companies given the costs they engender. If a regulatory scope is getting down slowly, defining a value for those grounds is a recent preoccupation to which the surveyor can answer. Before considering the estimation in itself, the regulatory context must be studied, to understand the process of depollution.

## 2. REGULATORY CONTEXT

### 2.1 Two Different Approaches

In France and in the other countries, the juridical context is recent and has many sources. Two main differences can be noted between states in the approach of the problem.

The first position taken by government was to initiate a national inventory of polluted soils. The goal was to know the number of polluted sites to envisage adapted policies. But counts are not the same everywhere. Some people consider a soil as polluted if pollution in the ground is proved. Others think that ground which are potentially polluted have to be included in the inventory. It is the famous precaution principle. Consequences of these differences can be seen in figures and in the treatments chosen by states.

The second difference is the level of depollution wished. Two sensitivities exist. The first one is trying to eradicate the pollution at any price. The Netherlands and Germany have chosen this way. In this case we can see the green preoccupations of this states. The second sensitivity is to try to adapt the depollution answer to future needs. Thus, the depollution level required is different if the future occupation of the site needs to welcome people or not. It is for example the position of France.

This table illustrate these remarks.

	Netherlands	Germany	France
Annual expenditure for soils depollution (million of Euros)	230	838	0,5
Number of site treated every year	200	220	90
Middle cost for one site treatment (million of Euros HT)	1.1	3.8	0.8

(source : l'Environnement magazine, avril 1995)

These counts are a bit superseded but they are a good illustration of philosophies on the topic. The Netherlands and Germany have chosen to have a global answer. Results are good but the cost is a real problem.

## 2.2 A shared Principle

In spite of two definitions of polluted soil and of depollution stage, one principle gather together all theories, who pollutes pays. This basic principle which is apply everywhere does not allow to pollute but oblige companies to clean the site after using it for industrial activities.

Certainly, laws in every state are more complex but it is here the main idea for this topic.

## 3. THE PROCESS OF DEPOLLUTION

Now, we know who has to depollute. So we have to see how depollute and what the cost of depollution is.

### 3.1 Which Depollution Processing to Choose ?

Several stages are to be followed to determine the pollutions.

The first stage is to know the historic of the site in order to detect old activities on the site which might be pollutant. The national inventory of industrial sites are a tool for the search. The country the more pointed is indisputably the Netherlands who considered the problem very early and who installed a real effective management of industrial sites.

If an industrial site is suspicious, we have to extract samples of ground to know the nature of pollution. We do the sample according to the nature of searched pollutants, the size of pollution, the situation...

The more recurrent pollutants on industrial sites are either metallic (lead, mercury, zinc or chromium), mineral (sulphur, chlorine) or organic (petrol).

### 3.2 Depollution Techniques

After this stage the problem is to adapt the depollution techniques to the pollution. Today we dispose of many techniques, relatively reliable and efficient, but very expensive.

Soils decontamination process can be classed among four families :

- To confine pollution: Pollutants are not treated but isolated from the rest to stop migration.
- *Treatment off-site*: Scraps are taken away and treated on special site.
- *Treatment in-situ*: Ground is leaving on the spot and pollutants are either extracted and treated in surface, either deteriorate, or fixed in the ground.
- *Treatment " on-site "*: Ground is hollowed and treated on the spot.

### 3.3 Depollution Cost

As regards polluted soil estimation, the knowledge of appropriate techniques for the treatment of the pollution allows us to assess the depollution. Costs can not be calculated for 1 m<sup>2</sup> which is the ideal situation for chartered estate. Indeed, the depth of pollution is a crucial point. It is logical that thicker the pollution layer is, the more expensive the price is. So prices are generally given for a metric ton.

And each technique is not always assessable because it depends on time or on a serious situation which was underestimated.

Here are some information about topical prices :

Techniques of depollution	Cost
Pumping	76,22 euros/ton
Venting	15,24 euros/m <sup>3</sup>
Lateral-confine	183 euros/m <sup>2</sup> of wall
Washing	from 15,24 to 150 euros/ton
Incineration	from 150 to 300 euros/ton
Vitrification	from 183 to 381 euros/ton
Biopile	from 38 to 99 euros/ton
Treatment by mushrooms	from 38 to 99 euros/ton
Bioventing	From 15,24 to 30,5 euros/ton

## 4. APPLICATION TO INDUSTRIAL SOIL ESTIMATION

This depollution costs are to be brought closer to prices of virgin or developed industrial ground.

In Lyon area we can consider, on average, that a virgin industrial ground is sold about 5,5 euros/m<sup>2</sup>. Developed, the same plot cost 20 euros/m<sup>2</sup>. The depollution cost became a burden for the owner and it is frequent to meet negative costs.

The position of the owner of a polluted industrial soil is extremely tricky, all the more since they are confronted with an unfair competition from the public collectivities who sell their plot at a loss to get back professional taxes.

So we have to find means to valorize a pollute ground in spite of pollution.

- The first solution is to sell the plot for a symbolic price but with financial compensation covered depollution costs.
- The second solution is a free loan with commercial compensation.
- Eventually, the third solution is the division in volume which allows to split up the ground and the pollutions with building.

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