Management of complex and / or large scale soil remediation projects

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Keywords: site management, site characterization, excavation of contaminated soils; remediation; rehabilitation; Brownfield; gasworks.

1. Introduction

During the last decade several gasworks sites have been remediated. Most of the time these sites were located in the or close to the city centre (see figure 1 and 2). On the other hand some large scale remediation projects have been executed; were large volumes of contaminated soil have been excavated, transported and treated (see figure 3). Envisan was involved in complex and / or large scale remediation projects, located in different countries (Belgium, Ireland, France and Tunisia).

In general these remediation works consist most of the time in a combination of different activities, such as additional site characterization, demolition, and selective excavation of the contaminated soil, the clean up of waste (tar; asbestos …), groundwater remediation and other related civil works.

It is obvious that most of these gasworks remediation projects have a long history. From the late eighteenth century until the end of last century coal gas production was commonly used all over Europe, in nearly all major cities. Contamination started many decades ago and the first environmental studies and impact assessments were executed a long time ago. Between the awareness of the problem and the execution of the remediation projects their can be a long period.

In case of (Brownfield) re-development, different steps have to be done such as:

- Initiative
- Planning (including site assessment, initial design)
- Financing of redevelopment
- Site Development (clean-up , remediation)
- Real Estate Development (building)
- Operation & Maintenance

In the next chapters and during the presentation several case studies will be presented.

2. Site assessment and initial design and financing the project

In the case of Tunisia (Taparura) (figure 3); different studies were executed from the years 1990 till 1997, samples were taken and analyzed. By 1997 it became clear that it was technically possible to solve the environmental problems. The planners were emphasizing a reconciliation of the city with its littoral by creating beaches and a new urban area, largely reclaimed from the sea to extend the city. The main problem was what to do with the complex industrial site, the phosphate dump of approximately 3,000,000 m³. The solution that was ultimately selected is to create a central piece in the whole area; a pyramidal looking park covering a total area of approximate 55 hectare.

With the technical solution in hand, it was necessary to obtain the financing for the project. So the project obtained the backing of the European Investment Bank (EIB). The remaining portion of the financing was contributed through export credit facilities sourced from abroad.

In the other cases; the timing between the first studies and the execution took also more then a decade. Nevertheless execution has been done and real estate redevelopment and maintenance is ongoing.

3. Execution of the remediation (site development)

3.1. Complex remediation projects

It is obvious that most of the gasworks remediation projects are quite a challenge; due to the following reasons : protection of underground services, heterogeneous ground conditions , removal of heavy contamination and redundant pipes and services, treatment of the heavy contaminated perched waters; deep excavation and transport of heavy contamination soil, presence of adjacent residential and industrial properties. It is clear that the remediation demands a lot of efforts and that some activities are crucial. The necessary environmental measurements (dust, odor and vibration monitoring) have to be implemented. The monitoring results have to be communicated to different stakeholders. Nevertheless from experience we know that an appropriate communication program have to be implemented; and this from the start of the project.

3.2. Large scale remediation projects

In Tunisia, on 30 March 2006, the Joint venture Jan DE NUL - ENVISAN – SOMATRA signed a contract for the remediation and the rehabilitation of the entire site. The Joint Venture was awarded the contract based on its competitive price and capability to offer a solution on a short notice. The project consists of different stages:

- A detailed site characterization (on- and offshore).
- The excavation and management of approximately 1.7 million m³ contaminated soils
- Dredging of approximate 0.5 million contaminated sediments.
- The rehabilitation of this pyramidal phosphate dome.
- Rehabilitation with 6, 1 million m³ of sand

The whole period for the remediation and rehabilitation works was approximately 2,5 years, with a total project value of approximately 80 Million Euro.

4. Conclusion

Each remediation project is different; the management of contaminated soils is a real challenge for all the stakeholders involved in the project. A decent site preparation and experienced project managers and contractors are a condition for a successful implementation of such a complex multidisciplinary approach.

Figures:

Figure 1. Gasworks in Waterford; Ireland

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Figure 2. Gaswork in Terken; France

Figure 3. Tunisia , Taparura