THE SOIL AND GROUNDWATER TECHNOLOGY ASSOCIATION

SAGTA REPORT 24 - REVIEWING TECHNOLOGIES: A QUESTION OF CONFIDENCE

Introduction

The provisions of the Landfill Directive are now being implemented at the operational level. This is expected to lead to restrictions in the disposal of contaminated land to landfill sites, more costly disposal when it is permitted and to the closure of many landfill sites that currently take contaminated land.

Against this tightening regulatory background, the importance of treatment technologies that prevent or reduce material being sent to landfill is clearly increased. Recent studies have suggested that there needs to be significant changes in remedial approaches if these aims are to be achieved. Up to 94% of remedial activities involved some civil engineering work, 16% had an in-situ treatment method applied and only 5% attempted ex-situ remedial treatment.

SAGTA's workshop of December 2003 aimed to review the market in remedial technologies and to try to ensure that it is ready for the demands of the Landfill Directive.

Key Issues Drawn from Workshop Presentations and Discussion Sessions

1 Establishing Confidence

Areas where SAGTA can contribute

- SAGTA members can identify opportunities for research projects (either basic or applied) and put them forward for investigation at the laboratory or field scale. Missed funding and research opportunities will be minimised by adopting this approach.

2 Instilling Confidence

Areas where SAGTA can contribute

- Continue to support the aims and objectives of CL:AIRE
- Work closely with CL:AIRE in the generation of potential projects for demonstration on test sites
- Strengthen links with First Faraday
- Take part in the Waste Permitting Review, which is being carried out by DEFRA
- SAGTA members to consider encouraging the planning of remedial treatment verification programmes before remediation commences.

3 Confidence from Experience

Areas where SAGTA can contribute

- Encourage remedial treatment contractor involvement at early stages of projects
- Initiate SAGTA study to collate information from SAGTA members of experience during remedial projects. This information to be collected using a SAGTA generated Remediation Project Assessment Form
- Disseminate the information collected during the above study, for example via CL:AIRE, journals or conferences.

Summary of Workshop Presentations

Establishing Confidence

Ideally the use of remedial technologies should be based upon sound scientific concepts that are supported by laboratory and bench scale tests. These will have been further developed in field tests and will have been widely used at site level. When a remediation technology is able to boast such a pedigree, it is very likely to be described as a proven technology under a specified range of conditions.

However, in reality there can be further complications. Local conditions are likely to be different at different sites and some form of extrapolation from the proven case is likely to be necessary. They may also be occasions when more than one technology will be needed to effect a satisfactory remediation and the confidence factor will be necessary for both technologies.

Comprehensive Research and Development (R&D) programmes are the exception rather than the rule these days because of the time and cost commitments that are involved. In certain circumstances, however, these programmes can be justified where they can meet identified future needs and are reasonably specific to a narrow range of contaminants.

The depth of commitment to this type of programme can be seen when it highlights a number of remedial technologies to be studied further. Each study then becomes almost a development project in its own right.

In all cases the overall project development must be related back to the potential problem are and this highlights the need to build a programme on a number of interlocking, basic approaches e.g. basic science, laboratory and pilot scale experimentation, all supported by accurate, detailed modelling algorithms.

Cost is naturally a concern when using technologies, although it is probably the cost relative to other competing options that is most relevant e.g. the cost relative to off-site disposal to landfill. These relative costs are about to change significantly in favour of treatment technologies with the implementation of the Landfill Directive.

Absolute, self-standing cost can be important in its own right when identifying areas for research. It is critical that cost does not exert undue and lasting negative influence against promising research projects, such that there is a significant barrier to the undertaking of this type of work. We have already seen that new research activity does constitute an important basis to establishing confidence in a technology.

Instilling Confidence

One of the prime remits of CL:AIRE (Contaminated Land: Applications in the Real Environment) is to educate and propagate knowledge and experience of remedial approaches to dealing with contaminated land.

Recently the European Commission (EC) has launched an Environmental Technology Action Programme (ETAP), which aims to remove some of the perceived barriers that exist in the development, take-up and use of environmental technologies.

There is recognition that the use of these technologies is poor when developing contaminated land. The list of barriers across the European Union is familiar – inappropriate, inconsistent and different implementation of legislation, development and implementation costs, poor levels of transfer of information and experience and low levels of education and training.

CL:AIRE aims to address particularly the education, training and transfer elements of these barriers. It has a policy of preparing and distributing Case Study Bulletins that cover either historic or current work on remedial schemes that may or may not have succeeded in reaching the original objectives. These are disseminated to a wide audience and can be used to advise and inform policymakers and regulators.

This process has been established for a number of years now and CL:AIRE is making changes to streamline the production of bulletins so that they are more widely available to interested parties, mainly by making use of enhancements in electronic transmission and publication techniques.

Additionally CL:AIRE and First Faraday (a Department of Trade and Industry – DTI – funded organisation, formed to provide a link between academia and industry in the contaminated land area) are considering how they can best work together to bring the results of research and demonstration projects to a wider audience.

The objectives of the Environment Agency (EA) in the application of remedial technologies are in-line with others. However, they have particularly recognised that issues around waste legislation (definition of waste, licensing of remedial activities and re-use of treated materials) can have a marked negative effect in the utilisation of remedial technologies. Additionally, they raise the prospect of residual liability as another deterrent (the use of remedial technology does not provide such a clean-break from contamination as 'dig and dump') and encourage an early approach to the establishment of a verification process.

Confidence from Experience

Without the rigorous approach undertaken in a comprehensive R&D programme, it seems necessary to rely on project specific pilot studies before remediation of the full scheme can be contemplated.

There are a number of ways the pilot scheme can be incorporated into the programme of works and they are all heavily influenced by the parallel commercial process that is set up to employ the services of a contractor. Ideally the pilot tests should be used at an early stage to inform the remedial goals. In this way some uncertainty is removed from the performance of the remedial treatment action and a commensurate reduction in cost should be observed. All too often, however, a contractor of a particular technology is asked to quote only for the final remedial stage. There can be uncertainty about the actual starting point (from site investigation data) and the uncertainty is reflected as a high cost to carry out the remedial works.

It is also possible to derive certainty from full-scale remedial projects and to perhaps define parameters for which such projects/technologies will be suitable in the future (operating windows). It is important to note that even these full scale projects rely on some form of pilot trials to give confidence for the whole scheme and are used to set early validation programmes. The added benefit here is that the confidence from pilot studies can be used to generate confidence with the regulators

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