

THE SOIL AND GROUNDWATER TECHNOLOGY ASSOCIATION

SAGTA REPORT 21 – SITE EXIT CRITERIA

Introduction

The setting and monitoring of site exit criteria is a vital management tool for the active control of remediation activities. It also plays a key role where agreement is to be established with relevant parties, whether they are regulators, consultees or those who have a subsequent interest in the land (e.g. developers), that the remediation has been or is the process of being achieved.

SAGTA's Workshop in December 2002 sought to identify issues that might arise and gain an update from a detailed research project being undertaken by the Environment Agency (EA) aimed at providing guidance on the verification of remediation. Aspects of presentations and areas where SAGTA members could contribute are summarised below.

Areas where SAGTA can contribute

- *Case studies:* SAGTA can provide case studies to the EA in order to provide 'real life' situations for comparison on Verification of Remediation.
- *Review and comment on the draft version of the guidance:* SAGTA is happy to comment on draft guidance at consultation stage.
- *Road testing the guidance:* SAGTA is happy to respond to the EA concerning technical suitability, ease of use and the practical experience of putting the guidance into practice.

Summary of Workshop Presentation

EA Guidance on Verification of Remediation

The EA guidance defines verification as:

'To establish the truth or correctness of a procedure by data or examination'

The guidance is to be suitable for all types of remedial methods, and is linked to associated guidance given in CLR 11 (Model Procedures for the management of Contaminated Land).

The guidance on Verification is planned to be split into the following sections:

- Define the remedial objectives. These comprise:
 - the site management objectives (including site exit criteria);
 - the site remedial objectives; and
 - the site remediation criteria or standards (e.g. Soil Guideline Values for human health, or Drinking Water Standards for groundwater).
- Define the Site Conceptual Model. This will provide the basis for lines of evidence for verification.
- Define the baseline conditions.

- Identify the lines of evidence to be used for the verification. Multiple lines of evidence may be required for different aspects. An indication of the level of confidence required should be given. The risk of creating new significant pollutant linkages (SPLs) as a result of the proposed remedial treatment should be considered.
- Data collection. Guidance is given on various different types of statistical tools for verification, sampling plans and also in QA/QC issues.
- The verification report. This will summarise and illustrate the above stages of the remedial process, i.e.:
 - Remedial objectives
 - Conceptual site model
 - Description of treatments used
 - Lines of evidence and the statistical basis on which to achieve the criteria
 - Sampling/analytical plan
 - Statement based on the lines of evidence detailing the extent to which the remedial treatment has been successful.

Members' Case Studies

There were a number of case studies presented by SAGTA members at the December 2002 Workshop. The main points that were highlighted from the case studies presented are:

- All parties (particularly the site owner and the regulator) need to agree the conceptual model and the site exit criteria from the start. This may even go to the level of detail such as agreeing the form of words to be used in closing the site, in order to give sufficient comfort for a new owner who will be investing in the site.
- Site monitoring data needs to remove uncertainty from the model.
- Cost benefit analysis has often been used to show that the site cannot be remediated any further.
- Statistical tools should not be the 'be all and end all' when deciding on lines of evidence for verification. Other evidence, such as microbial counts or contaminant mass balance calculations could be used.
- There is sometimes disagreement as to '*how much data is enough*'?
- It is important that the strengths and weaknesses of a statistical tool are understood before it is used for statistical verification. This is in much the same way that the most suitable risk assessment tool must be chosen with an awareness of its limitations.
- For IPPC closure on historically contaminated sites a purely statistical approach is not practical and other lines of evidence will be needed. This is due to the more stringent requirement for the site to be returned in the same state as before the process was started. Due to generally heterogeneous nature of contaminants on contaminated sites, and the potential limitations of the baseline survey (due to existing buildings and services, for example), the baseline survey is unlikely to be a definitive statement of the existing condition of the site.
- Flexibility is required in setting site exit criteria, as all the detail of the site may not be known or understood at the beginning of the remedial process. Hence there needs to be a method for communicating change during the treatment period.

- A risk based approach is not compatible with full closure transfer liability, for sites to be sold on to a new owner

Legal Interfaces

Legal interfaces between exit criteria and contracts were also considered with emphasis on:

- Clearly identifying areas of concern
- Ensuring contents clearly cover the factors
- Establishing clear basis of sign off
- Understanding of related timing issues and provision of clear contract machinery
- Options to consider insurance or other assurance arrangements

For further information on SAGTA please contact the Secretary of the Association Doug Laidler at douglas.laidler@atkinsglobal.com or Tel +44 01372 726140

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