THE SOIL AND GROUNDWATER TECHNOLOGY ASSOCIATION

SAGTA REPORT 11 - SITE SPECIFIC RISK ASSESSMENT: DEVELOPING A FRAMEWORK

Introduction

SAGTA held a second seminar on the topic of risk assessment on the 2nd December 1999, the first being held in March 1995. The aims of the seminar were to explore the need for, and the extent of a framework for site specific risk assessment.

The broad shape of the day's programme was to share experiences, examine current guidelines on initiatives and debate the way forward on key issues arising.

Key issues were considered to fall into 3 main subject areas:

Toxicological Data

- sources of toxicological data are not always apparent;
- data are rarely complete, particularly in relation to dermal pathways;
- background levels raise particular issues especially in circumstances where the background concentration of a naturally occurring substance exceeds the risk derived criteria;
- asbestos in soil - lack of exposure guidance.

Models

- a conceptual site model that includes all potential scenarios is the key;
- there is a current weakness in that there are insufficient case studies derived from models feeding back into:
  -how does one select which model to use; and
  -which models will suit particular circumstances.
- what validation data exists?
- at what stage should uncertainty be considered? Where should the effort in resolving uncertainty be concentrated?
- what is the balance between uncertainty and risk?
- are pathways additive? How should mixtures be handled?
- analysis of sensitivity.

Risk Presentation

- how should risk be presented and how should the perception of that risk be influenced?
- what influence does odour and unsightliness have? How do we handle dislocations in the information flow - e.g. when a plot is sub-divided for different uses. Will the proposed Land Condition Record be of value in this respect?
- free product is generally not dealt with within a risk based framework, although SAGTA felt there is no reason why the issue cannot be handled in such a way;
- how is data to be handled? Are the processes sufficiently transparent?

Areas of SAGTA contribution

- some guidance on uncertainty may be available from radiological work;
- Features, Events and Processes (FEP) used to assess radiological risk may be of value to SAGTA Members in aiding the accurate definition and identification of broader scenarios;
- comparison with Safety Risk Assessments may be useful;
- SAGTA to consider source management issues as a future workshop topic.

Summary of the Presentations

Development of RBCA in the United States. Two specific issues requiring further work- natural attenuation and vapour pathways were identified. The key research organisations in the United States and the specific challenges facing them were described.

Case Studies. The Workshop looked at a systematic approach to radiological risk assessment, the framework of which was originally developed for the assessment of radioactive waste disposal sites. The approach considers Features, Events and Processes (FEP) and relates to the near-field, geosphere and biosphere through interaction matrixes.

Continuing the nuclear theme, interactions with the regulator in assessing and investigating the risks presented by tritium in groundwater were considered.

Update of technical guidance. A summary of the technical guidance due to be published in the near future was provided.

Human health assessment models. The Workshop then moved on to a broad comparison of human health assessment models. The need for guidance on selection of site specific risk assessment tools was identified, although the key issue was judged to be the justification of any selection process (both of the model and any options contained within it).

Recent work undertaken by the Scotland and Northern Ireland Forum for Environmental Research (SNIFFER) on a framework for deriving site specific numeric targets to minimise the potential adverse human health effects of long term exposure to contaminants in soil was presented. This emphasised that the framework was a route to a solution through a deterministic rather than probabilistic approach.

Groundwater contamination models. The final presentation within the workshop incorporated descriptions and illustrative modelling of groundwater contamination risk modelling using the ConSim model. An important feature illustrated in the demonstrations was the impact of the rate of degradation of hydrocarbons on the modelled outputs.

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