

Workpackage E - Robust Sustainable Technical Solutions to Contaminated Brownfield Sites

Objectives

1. To carry out generic assessment of the sustainability of available containment and clean-up remediation methods.
2. To investigate the relative sustainability of a number of those remediation methods.
3. To improve technical solutions using laboratory testing and possible applications to portfolio sites.

Conceptual Model

Very little work has been done on the generic assessment of the sustainability of individual remediation methods in the UK and more importantly on a comparative investigation of their relative sustainability. Remediation of contaminated land is usually carried out using a risk-based approach, and is often very much site-specific. This means that possibilities for improving these methods may have been overlooked, by concentrating primarily on core objectives and neglecting wider implications. The effect of different factors on robustness and durability of remediation techniques will be considered, leading to improvements in the sustainability of these methods, and thereby producing enhancements in terms of lower remediation costs, and/or lower environmental impact.

Sustainable technical solutions to brownfield land need to be robust; they must not be sensitive to small changes, have a low risk of failure and need to be durable. Remediation solutions are sustainable if:

1. Future benefits outweigh cost of remediation,
2. Environmental impact of the process is less than the impact of leaving the land untreated,
3. Environmental impact of the remediation process is minimal and measurable,
4. The time-scale over which the environmental consequences occur, and hence inter-generational risk, is part of the decision making process, and
5. The decision making process includes proper engagement of all stakeholders.

For each remediated site, information on criteria 1, 2, 3 and 5 is available, although in some cases might not be readily obtainable, for example because of commercial sensitivity. However, knowledge of the inter-generational risk and durability of the various remediation methods, which is needed to achieve criteria 4 above, is very limited. This topic has been recognised by the Environment Agency and the construction industry as one which requires immediate research attention. This work package will address sustainability criteria 1-4 while criteria 5 will be addressed in work package C.

Methodology

- **Task 1: Knowledge/information collection** **(Months 1-6)**

Information/knowledge on a large number of completed remediation projects in relation to the criteria 1-4 above will be collected and analysed involving organisations such as CIRIA, CL:AIRE, NICOLE, CABERNET, RESCUE, USEPA etc.

- **Task 2: Assessment & comparison of sustainability of existing remediation techniques** **(Months 7-12)**

A means of assessing and comparing the sustainability of different remediation projects will be produced. Using the data generated above, remediation techniques that could be improved in terms of robustness and/or durability will be identified, along with methods of improvement.

- **Task 3: Experimental investigation of sustainability improvements** **(Months 13-25)**

Laboratory experiments will then be performed to determine methods of improving the robustness and durability of several remediation methods investigated earlier in the project. Scaling up of methods investigated above may then be performed, with possible application to contaminated sites or in collaboration with a wide range of stakeholders on specific regeneration projects.