

# Science for Environment Policy

## A standard method to assess effective measures for contaminated site remediation

**A standardised method to help** choose the most cost-effective measures to remediate contaminated sites has been developed by Austrian researchers. The method takes into account a wide range of factors, including the principles of sustainability.

**Across Europe, there could be around 3 million sites** with contaminated soil, of which 400,000 still need to be cleaned up, according to the European Environment Agency. In some cases, remediation measures must be paid for by the public, via taxes. This is particularly true for historically contaminated sites (as the industry or activities responsible for the pollution no longer exist,) or liability for the contamination can not be enforced through law.

In Austria, to make the most of limited funds and to also distribute them fairly, a method to assess remediation measures for historically contaminated sites has been developed which incorporates the principles of sustainability. Sustainable restoration of a contaminated site needs to consider not only the costs of various remediation options, but also the effectiveness of the different measures in improving the environment (e.g. restoring contaminated groundwater to minimum accepted standards) as well as the social impacts (e.g. disturbance, health impacts, noise or dust) of implementing the various measures. All funding applications for remediation of historically contaminated sites to the Austrian National Remediation Fund have had to use this method since 2012.

In developing the sustainability assessment method for contaminated site management in Austria, researchers consulted relevant stakeholder groups, including Ministry of Environment and provincial officials, planners, engineers, owners of contaminated sites and real estate managers.

The method is based on a modified cost-effectiveness analysis, which separately assesses the effectiveness of various measures and the costs of each measure. The method first involves selecting appropriate remediation measures that are technically and legally feasible. The effectiveness of each one of these measures is then considered by using set objectives and goals that must be met. A hierarchical system of objectives, goals and indicator categories to measure the performance of the various measures was formed in consultation with the relevant stakeholder groups. Different weightings were assigned to the objectives and goals to reflect their relative importance to the various stakeholders as well as their response to national laws and guidelines, e.g. regulations on water and waste management.

The highest level represents the more abstract objectives ('environment', 'local development', 'project stability') which were based on sustainability principles, including maximising the environmental, socio-economic and technology-related benefits. The second level, or the goals, are more specific and selected to fulfil the requirements of the objectives. The third level, or the indicator categories, specify the effects of the goals. The fourth level contains the criteria selected to assess the effectiveness of the remediation measures.

For example, Objective 1: 'Environment' is designed to maximise the environmental benefit. To meet this objective, there are two goals: one to actually remediate the site and achieve remediation targets, and the second to consider environmental side-effects. The indicator categories specify the environmental effects of each goal: e.g. the effects on the source of pollution for the first goal and the impact of the remediation measures on natural resources for the second goal. The criteria that measure the performance of the remediation are site-specific and determined on a case-by-case basis. One of the criteria, could, for example, be the removal of a specific contaminant under the first goal; and the amount of water consumed by remediation measures under the second goal. The method has been widely accepted in Austria thanks to the involvement of stakeholders at all stages of the development process. Furthermore, the range of stakeholders has helped to ensure a balanced approach when deciding on the objectives, goals and indicator categories used in this method.



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