

An ecological risk assessment framework for contaminants in soil

Science Summary SC070009/SS

The Environment Agency has developed an ecological risk assessment (ERA) framework for contaminated soils in collaboration with the Department for Food, Environment and Rural Affairs (Defra), Natural England, Welsh Assembly Government, the Countryside Council for Wales, local authorities and industry. The ERA framework aims to provide a structured approach for assessing the risks to ecology from chemical contamination in soils – a requirement under Part 2A (Contaminated Land) of the Environmental Protection Act 1990.

The framework consists of a three-tiered risk assessment process:

- Tier 1 of the risk assessment is a screening step based on a comparison of chemical analyses of site soils with a soil screening value (SSV) for the contaminants of potential concern.
- Tier 2 uses a choice of tools (ecological surveys and biological testing) to gather evidence for any harm to ecological receptors (plant and animal species) present at the site.
- Tier 3 seeks to attribute the harm to the chemical contamination.

The risk assessment is preceded by a desk study that reviews information about the site and nature of the contamination to assess whether pollutant linkages are feasible.

The ERA Framework has been designed to:

- establish whether pollutant linkages are likely to exist between the contamination and the designated ecological receptors;
- gather sufficient information for making decisions regarding whether harm to these receptors is occurring or could occur in the future.

The document describing the ERA framework (ERA 1) is supported by six guidance documents covering the activities that can be employed at each of the tiers. All

the documents refer to the Statutory Guidance on Part 2A where necessary. Guidance is given on:

- desk studies and Conceptual Site Models (ERA 2a)
- use of soil screening values (ERA 2b)
- use of bioassays (ERA 2c)
- use of ecological surveys (ERA 2d)
- attribution of cause and effect (ERA 2e)
- Standard Operating Procedures (SOPs) for bioassays (ERA 3).

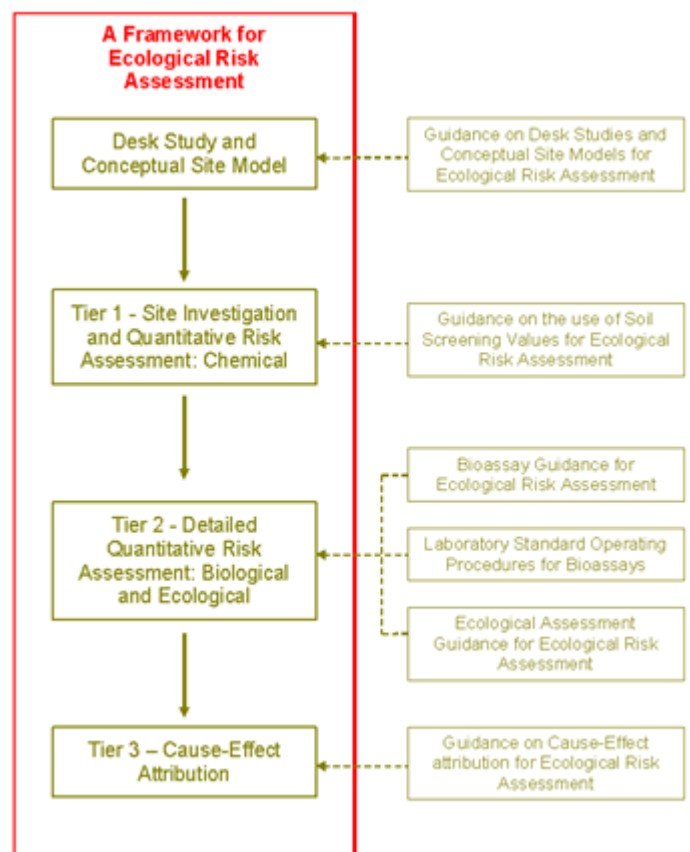


Figure 1: The relationship between the tiers of the ERA Framework

The introductory document (ERA 1) explains the role of the ERA framework as an aid to decision-making about whether or not land is deemed 'contaminated' based on risks to ecological systems. A commentary on the key points of flow diagrams depicting the tiers of the framework highlights the guidance available to risk assessors and others using the ERA framework, while four examples illustrate its use in practice.

The overall aim of the ERA framework is to help regulators and land owners meet the statutory requirements of Part 2A. It is intended to structure decision-making and, as such, does not seek to provide criteria on which determinations of contaminated land can be made. These decisions remain with the regulator.

The ERA framework for contaminants in soils is based on best practice in risk assessment and consequently can also be used in contexts other than Part 2A, such as within conservation regulations, and planning and pollution control.

This summary relates to information from Science Project SC070009, reported in detail in the following output(s):

Science Report: SC070009/SR1

Title: An ecological risk assessment framework for contaminants in soil

ISBN: 978-1- 84432- 939- 7 **October 2008**

Report Product Code: SCHO0908BOOZ-E-P

Science Report: SC070009/SR2a

Title: Guidance on desk studies and conceptual site models in ecological risk assessment.

ISBN: 978-1- 84432- 946- 5 **October 2008**

Report Product Code: SCHO1008BORP-E-P

Science Report: SC070009/SR2b

Title: Guidance on the use of soil screening values in ecological risk assessment

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Report Product Code: SCHO1008BOSQ-E-P

Science Report: SC070009/SR2c

Title: Guidance on the use of bioassays in ecological risk assessment.

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Title: Guidance on the use of ecological surveys in ecological risk assessment.

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Science Report: SC070009/SR2e

Title: Guidance on the attribution of cause and effect in ecological risk assessment.

ISBN: 978-1- 84432- 949- 6 **October 2008**

Report Product Code: SCHO1008BORW-E-P

Science Report: SC070009/SR3

Title: Standard Operating Procedures for bioassays.

Available to laboratories on request

Internal Status: All regions

External Status: Publicly available

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