

# Development on Potentially Contaminated Land



**Informal guidance produced by the Hampshire and  
Isle of Wight Contaminated Land Liaison Group**

# Introduction

Local Planning Authorities are receiving an increasing number of planning applications for developments on previously used, or brownfield, sites where the potential for land contamination exists. This leaflet is designed to assist developers, agents and consultants deal with the planning issues associated with re-development of such sites. It is not intended to provide comprehensive guidance to dealing with all contaminated land issues and consideration should be given to the references enclosed.

Land may be affected by contamination as a result of historical land use, principally from industrial processes, waste disposal and accidental spillages. If land contamination is not dealt with adequately it can pose risks to human health, the environment and sustainable economic development.

Government guidance recognises land contamination as a material planning consideration and that the development phase is the most cost-effective time to deal with the problem and it is the developer's responsibility to ensure that the development is safe and suitable for its intended use. Planning Approvals given to sensitive developments on brownfield sites commonly have conditions attached requiring an assessment of land contamination. It is the Local Planning Authority's (LPA) duty to ensure that the developer undertakes this assessment and implements any remedial requirements in a responsible and effective manner. The Environment Agency and local Environmental Health Department will act as consultees regarding risks to controlled waters and human health respectively.

Failure to appropriately address risks from land affected by contamination at the time of development may result in later action being taken under Part IIA of the Environmental Protection Act 1990. All Local Authorities have a duty under this legislation to identify contaminated sites that pose a risk to health or the environment. Where such risks are identified the Local Authority has a duty to either bring about voluntary clean-up of the site or enforce the clean-up through service of notices and, possibly, prosecution.

The Building Regulations 2000 (as amended) give Building Control Officers the authority to address contamination and land gas issues within the curtilage of the property. The developer must demonstrate when requesting Building

Control approval that hazards from contaminants or elevated ground gases have been properly assessed and measures have been put in place to address all identified risks.

In addition to the above legislation developers will also need to consider the welfare of construction workers operating in potentially contaminated sites and the management of potentially contaminated waste spoil.

It is important that confidence can be assigned to site assessments and remediation schemes. A documented assessment of land contamination and all actions taken will assist regulators and ensure that any future enquiries regarding the site can be answered effectively. This will maintain public confidence when redeveloped brownfield sites are marketed.

## Investigation and Remediation

All works must be undertaken by a suitable person who can demonstrate that they possess the knowledge, skills and experience necessary to satisfy all parties.

A phased investigation allows the results of each stage to be scrutinised and used to devise the next phase of work. The developer is encouraged to submit each phase to the LPA at the earliest opportunity for approval. This may prevent avoidable delays and may indicate that full intrusive investigation and quantitative risk assessment is not required, thus avoiding unnecessary works and costs.

Where significant contamination issues are anticipated on a development developers are encouraged to undertake pre-application consultation with the Environment Agency and/or the Environmental Health department.

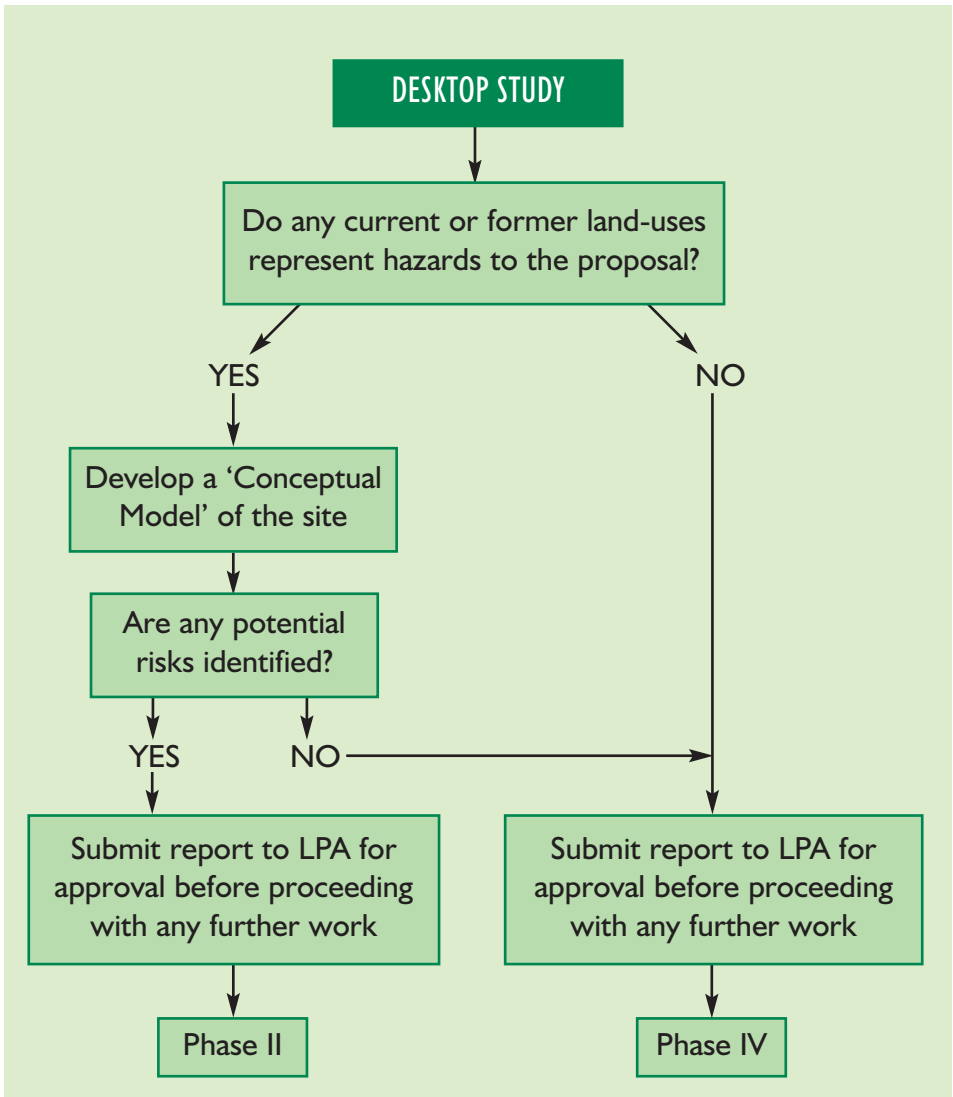
Submission of a desk-study or other supporting information with the application may assist the decision making process.

The process to assess and manage ground conditions can be divided into four key steps (or phases), each step is outlined in the following pages with a procedural flowchart summarising the key elements and decision points within each stage.

# Phase I Assessment

## Desktop study, site walkover and qualitative risk assessment

A desktop study is used to identify the potential risks that may affect a development and must recognise the influence of surrounding land and receptors.



It is strongly recommended that a Phase I Report is submitted as a minimum with your planning application should the land be suspected of being contaminated and/or if the proposed land use is considered sensitive to contamination.

As a minimum it should include:

- A walkover survey including dated photographs
- Location and site plan
- Extracts and/or analysis of current and historical maps identifying potential contaminating features
- Description of ground conditions: hydrology, geology, soil classifications
- Details of any sensitive receptors such as controlled waters, water abstractions, sites of archaeological or ecological interest
- Details of services on site
- Details of former industrial/commercial uses such as processes and their locations, nature of raw materials, products and wastes
- Any existing documented records relating to the site's condition

Land contamination is not exclusively associated with major industrial processes or waste disposal. Careful consideration must be given to a site's potential to be contaminated. Naturally occurring substances, informal uses and minor ancillary activities may all impact on soil quality.

## Conceptual Model

Where potential contaminants might exist the potential risk needs to be identified by means of a 'conceptual model'. This should identify all the likely 'source → pathway → receptor' routes applicable to the proposal.

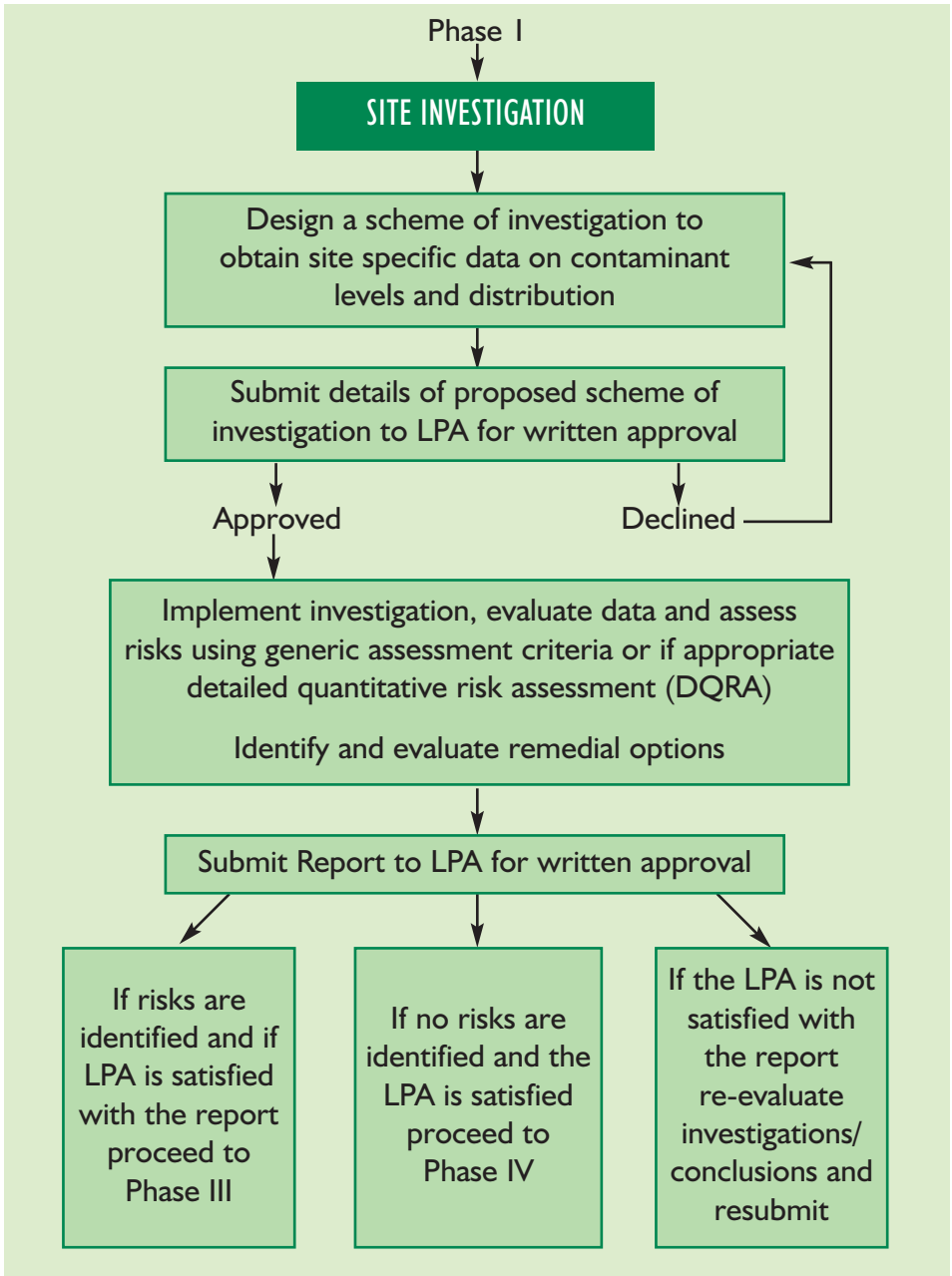
## Required Output

Finally the report should conclude what the likely risks are, if any, and recommend what further work is be required to validate or quantify these risks.

The report should be submitted to the LPA prior to any further site works proceeding to ensure they are satisfied with the content, conclusions and recommendations made.

# Phase II Assessment

## Detailed investigation and risk assessment



The Phase II assessment will confirm site specific conditions, such as geology and hydrogeology, that were identified during the Phase I assessment.

The investigation should obtain representative soil, soil gas and water samples where appropriate, for analysis, the results of which should feed into the risk assessment process.

The key requirements of a Phase II investigation report include:

- Aims and objectives
- Reference to the Phase I assessment and conceptual model
- Consideration of proposed development
- Site plan prior to development
- Plan of proposed site layout following development
- Plans marking the location of sample points
- Details of any site sampling strategy and justification for methodology
- Details of laboratory analysis, including methodology, results, accreditation and quality control procedures adhered to
- Methodology by which the samples are collected, stored and preserved
- Information/logs collated from intrusive trial pits, borehole logs, etc.
- Interpretation of the site conditions and sampling results
- Further details of any monitoring proposed
- A discussion of the sampling results in relation to the site conditions
- Comparison of sample results to acceptable generic risk screening values or site specific criteria
- Suitable Risk Assessment
- Discussion, conclusions and recommendations for further work

## Land Gases

Land gases, in particular methane and carbon dioxide, are an important consideration and monitoring must be carried out in accordance with best practice. Levels can vary greatly, affected by atmospheric pressure, temperature, ground water levels etc. If the initial (Phase I) assessment identifies a potential land gas source, 6-12 months of monitoring data may be needed to confidently characterise the gas regime. Therefore, it is essential that sufficient time is made available to monitor ground gases properly and the LPA is consulted at the earliest opportunity.

## Laboratory Analysis

Test methods should be MCERTS accredited and reported results must indicate the methods used with an estimate of bias and precision.

## Data Evaluation

It is often assumed that the results obtained from sampling are representative of the actual ground conditions. This is not always the case due to variations in the site and uncertainties in the measurement. To ensure confidence in the decisions made it is essential that the soil sampling strategy is appropriate and that the data is adequately evaluated. This may include the use of statistical tests [See Recommended Guidance - CLR 7].

## Risk Assessment

All decisions regarding land contamination are based on risk and the assessment of that risk.

Where quantitative site data is available two types of risk assessment can be used:-

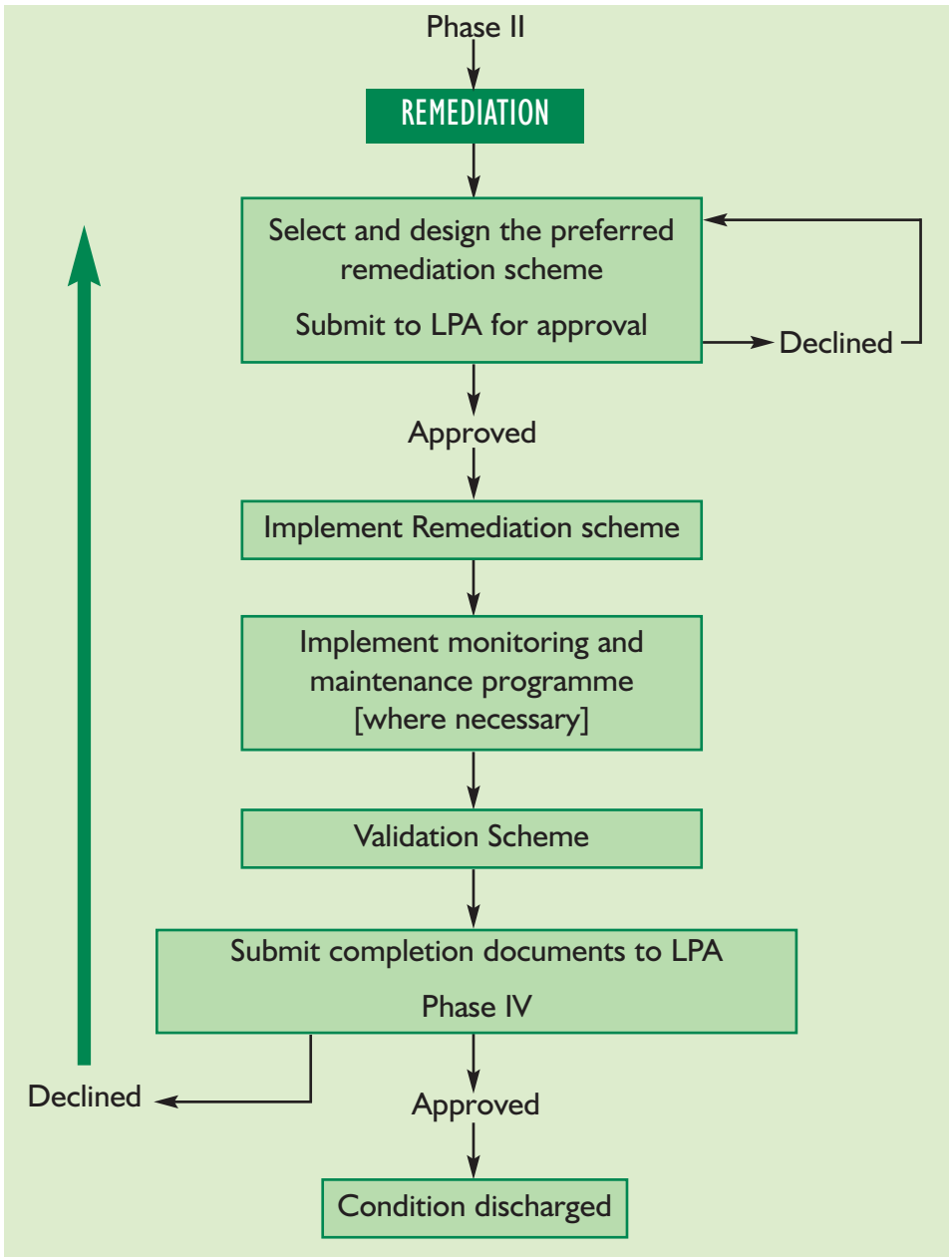
- **Generic Assessment Criteria (GAC).** These are “guidance values” determined using standardised exposure scenarios. To be appropriate GAC must reflect the “real life” on-site scenario and be developed according to UK policy decisions. Soil Guideline Values (SGVs) were provided specifically for the UK, but currently only include a few key contaminants. Other GAC include the American USEPA Soil Screening Levels (SSL) and the Dutch Serious Risk Concentrations (SRC). Where these other values are used it is important that their applicability is justified.
- **Detailed Quantitative Risk Assessment (DQRA).** If generic guidelines are not available or are inappropriate it may be necessary to generate site specific criteria.
- Values derived from DQRA must be able to demonstrate transparency in the procedures used, evidence of sound science and clarity in the assumptions made. Due to the complicated nature of this process it is essential that prior consultation takes place with the LPA.

It should be noted that DEFRA has withdrawn the ICRCCL Guidance Note 59/83 2nd Edition 1987; the trigger values contained within the report are no longer considered to be “appropriate, authoritative and scientifically based guidelines” and are not consistent with the new approach to risk assessment. Therefore the LPA will not accept ICRCCL trigger values used for the purposes of risk screening.



# PHASE III

## Development and implementation of a remediation strategy



The design of the remediation strategy should consider the results from the previous two phases of investigation and consider the proposed use/layout of the development.

The purpose of this stage is to consider the risks and design measures to remove the risks that are appropriate to the nature of the intended development.

The key requirements of a remediation strategy are:

- Reference to the risks identified in the previous investigations
- Reference to the nature and layout of the proposed development
- Description of the proposed remediation and how it will remove the risks identified
- Method statements for the proposed works
- Specifications
- As built drawings
- Calculations, where required
- If remediation will attempt to reduce the concentration of contaminants on site then details of the intended target values must be submitted and agreed
- Identify monitoring and maintenance programmes

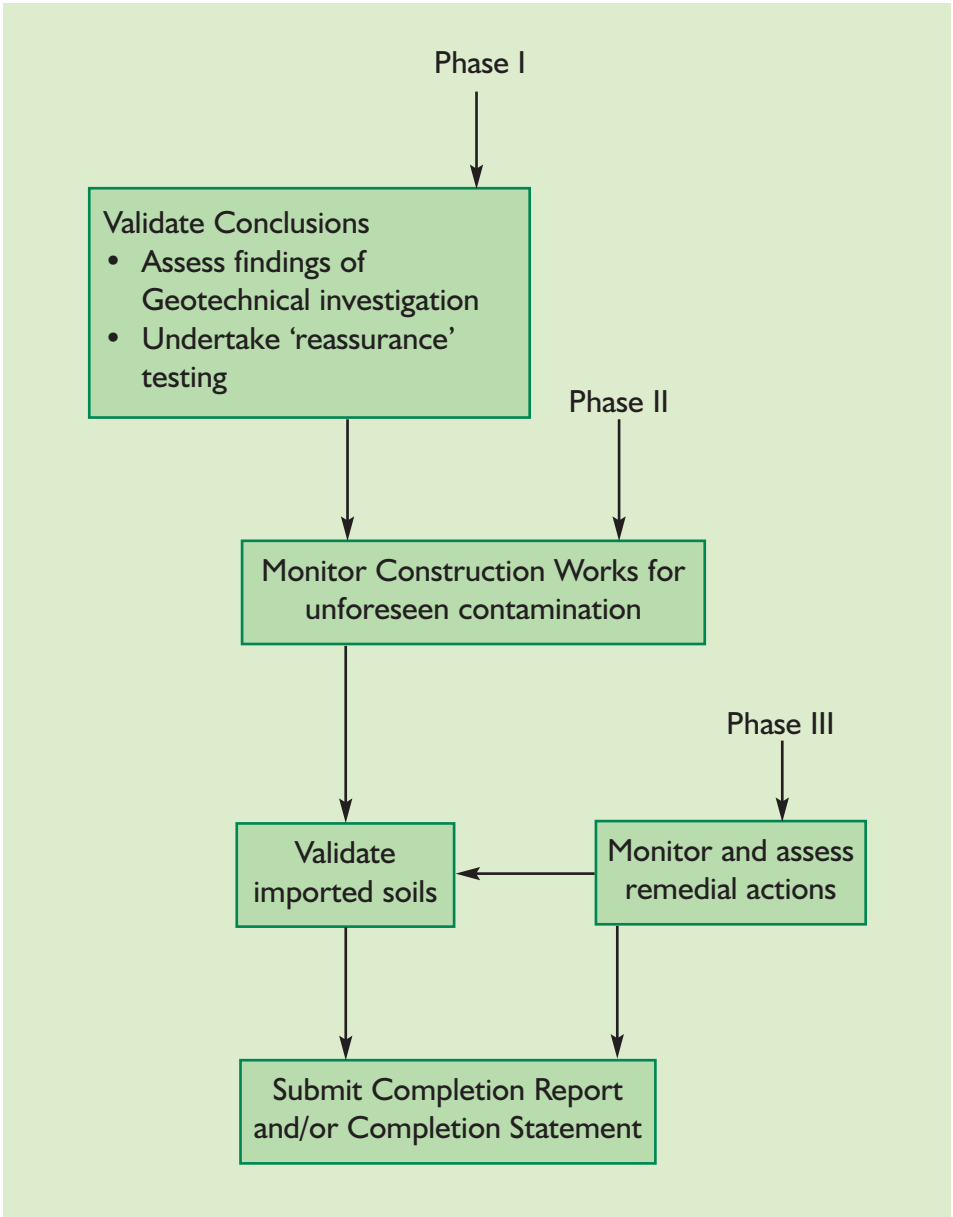
## Required Output

The presentation of a remediation strategy to the LPA for approval.



# PHASE IV

## Completion and Validation



No site assessment or investigation can guarantee to identify all contamination hazards. Therefore, it is essential that other evidence acquired during the project is used to review any earlier assumptions and validate the conclusions made. For example,

- Where the initial (Phase I) assessment indicates no suspected hazards this can be substantiated with information gathered from geotechnical investigations. This exercise can be extended to include reassurance testing of soils on particularly sensitive developments or where the desk study has been inconclusive.
- Throughout all groundworks evidence of contamination must be monitored and, where detected, appropriately managed to the satisfaction of the LPA.

Where potential risks are identified on a site it may be necessary to undertake a programme of monitoring during and after development. This monitoring scheme and subsequent findings must meet the LPA's satisfaction before the discharge of any related planning conditions.

Successful remediation of a site is dependant upon implementing the scheme to the specified standard. A Completion Report is used to demonstrate this providing evidence of actions undertaken. It may include -

- Ground level surveys to demonstrate the depth of caps installed
- Photographic evidence of installed features
- Reassurance sampling
- Laboratory results of imported soils
- Post completion gas/water monitoring

On completion of all sensitive developments the submission of a Completion Statement (see enclosed template) provides the developer with the opportunity to validate all their actions. If submitted with all relevant supporting documents, it will assist the Local Planning Authority in discharging any relevant conditions and aid responses to any Local Land Charge Search enquiries received when properties are marketed.

# Completion Statement Template

Proposal

Planning Application Number

Undertaken between the dates of

and

Notes:

1. Please complete Part A in Full.
2. If no risks were identified go straight to Part D and E if appropriate.
3. If risks were identified complete Part B and E and Parts C and D if appropriate

## Part A

This is to confirm that the above named development was subject to an approved scheme\* of investigation prior to development to assess the presence and significance of potential ground contamination as detailed in:

Title:	Ref:	Author:	Date:	(list all relevant documents in full)
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## Part B

To afford protection from those risks identified a scheme of remediation was implemented between the dates of.....and.....in accordance with best practice and the agreed specification\* detailed in:

Title:	Ref:	Author:	Date:	(list all relevant documents in full)
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## Part C

Satisfactory implementation/post completion monitoring of the scheme is detailed in:

Title:	Ref:	Author:	Date:	(list all relevant documents in full)
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## Part D

Soils imported during the development are certified as being clean of contamination in the document/documents...

Title:	Ref:	Author:	Date:	(list all relevant documents in full)
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**Part E**

All contractors employed by .....  
(the developer) were required to monitor for, and report, any evidence of further, unsuspected contamination found during construction. (Delete as appropriate)

- None was reported.
- Further, unsuspected contamination was found. Actions taken are detailed in:

Title:	Ref:	Author:	Date:	(list all relevant documents in full)
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**Part F**

Signed:

Date:

.....  
.....  
.....

Appointed person supervising the works  
(Enter name, company, address and position)

Signed:

Date:

.....  
.....  
.....

For the Developer  
(Enter name, company, address and position)

**\*Approved In writing by the Local Planning Authority**

## Recommended Guidance and Web Links:

1. British Standard BS10175:2001 *Code of Practice for Investigation of Potentially Contaminated Sites*, British Standards Institute, London.
2. Department of the Environment (1995/96). *DOE Industry profiles*. London. Wide range of industrial activities and potential contaminants listed.  
**<http://www.defra.gov.uk/environment/landliability/pubs.htm>**
3. Office of the Deputy Prime Minister (2004). PPS 23 Annex 2, *Development on Land Affected by Contamination*.  
**[http://www.odpm.gov.uk/stellent/groups/odpm\\_planning/documents/page/odpm\\_plan\\_032636.hcsp](http://www.odpm.gov.uk/stellent/groups/odpm_planning/documents/page/odpm_plan_032636.hcsp)**
4. Office of the Deputy Prime Minister. *The Building Regulations 2000, Site Preparation and Resistance to Contaminants and Moisture, Approved Document C*. ISBN 0-11-753913-9, Available from The Stationary Office (TSO).  
**<http://www.tso.co.uk>**
5. CIRIA. 3. Comprehensive guidance on all aspects of developing contaminated land, *SP101-SP112, SP119, R131, R149-R152*.  
**<http://www.ciria.org.uk/acatalog/Publications.html>**
6. Environment Agency and National House Building Council (2000) *Guidance for the Safe Development of housing on Land Affected by Contamination*, Publication 66, Available from the Environment Agency R&D Dissemination Centre, WRc plc, Swindon SN5 8YF.  
**<http://publications.environment-agency.gov.uk/epages/eapublications.storefront>**
7. Department of the Environment, Food and Rural Affairs and the Environment Agency, *SGV, Tox Reports and Research Reports CLR7-11*. Available from the Environment Agency R&D Dissemination Centre, WRc plc, Swindon SN5 8YF.  
**<http://publications.environment-agency.gov.uk/epages/eapublications.storefront>**

8. Environment Agency R&D Technical Report P5-065 (2000) *Technical Aspects of Site Investigation*. Available from the Environment Agency R&D Dissemination Centre, WRc plc, Swindon SN5 8YF.  
**<http://publications.environment-agency.gov.uk/epages/eapublications.storefront>**
9. Environment Agency R&D Technical Report P5-066 (2004) *Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination*. Available from the Environment Agency R&D Dissemination Centre, WRc plc, Swindon SN5 8YF.  
**<http://publications.environment-agency.gov.uk/epages/eapublications.storefront>**
10. SNIFFER (2000). *Framework for Deriving Numerical Targets to Minimise the Adverse Human Health Effects of Long-term Exposure to Contaminants in Soil*. Prepared by Land Quality Management Ltd. And published by Foundation for Water Research (FWR), Marlow.
11. Health and Safety Executive. *Protection of Workers and the General Public During the Development of Contaminated Land*. HMSO London, ISBN 011 885657X.

### Further Web Links

Environment Agency	<b><a href="http://www.environment-agency.gov.uk">www.environment-agency.gov.uk</a></b>
Department of the Environment, Food and Rural Affairs	<b><a href="http://www.defra">www.defra</a></b>
CIRIA	<b><a href="http://www.ciria.org.uk">www.ciria.org.uk</a></b>
Contamlinks	<b><a href="http://www.contamlinks.co.uk">www.contamlinks.co.uk</a></b>
National House Building Council	<b><a href="http://www.nhbc.co.uk">www.nhbc.co.uk</a></b>
Sanaterre Environmental	<b><a href="http://www.sanaterre.com/guidelines/index.htm">www.sanaterre.com/guidelines/index.htm</a></b>

This document is intended as informal guidance and does not constitute formal Supplementary Planning Guidance.