



GUILDFORD  
B O R O U G H

## **A Developer's Guide to Contaminated Land**

**September 2007**

A technical guidance note for applicants, developers, landowners and consultants involved with development on land potentially affected by contamination in the Guildford Borough.

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## Overview

The purpose of this guide is to make applicants, developers, landowners and their advisors aware of the information this Authority requires in order to assess an application for planning consent on land which may be affected by the presence of contamination or land used for sensitive end uses such as residential housing.

This document is not a step-by-step guide to dealing with all contaminated land issues and developers are encouraged to discuss potential contaminated land issues with the Borough Council's Environmental Health and Licensing Services, Development Control and Building Control Teams. This will help to prevent avoidable delays during the development process.

If you have any queries on contaminated land issues, please contact the Environmental Health and Licensing Division at:

Guildford Borough Council  
Millmead House  
Millmead  
Guildford  
GU2 4BB

Tel: 01483 444371

Fax: 01483 444546

<http://www.guildford.gov.uk/environmentalhealth>

## **Introduction**

The borough of Guildford covers approximately 270km<sup>2</sup> with a population of approximately 128,000 inhabitants, half of which live within the urban area. Historically, land use within the borough has included gunpowder manufacture, brewing, mineral extraction and heavy metal manufacturing; such industries have the potential to cause contamination of land.

Contamination of land may threaten public health and safety, the natural environment, the built environment and economic activities, through its impacts on the users of the land, and on neighbouring users.

Land contamination, or the possibility of it, is therefore a material planning consideration in the preparation of development plan documents and in taking decisions on individual planning applications. It remains the responsibility of the landowner/developer to identify land affected by contamination and to ensure that remediation is undertaken to secure a safe development.

## What is contaminated land?

The presence of contamination can affect or restrict the beneficial use of land and it is development which presents an opportunity to deal with it. Contamination is not restricted to previously developed industrial land but it can occur also on greenfield sites and it can arise from natural sources as well as from human activities.

Contamination can create risks to human health, property and the wider environment, including long-term limitations on the use of soils. The real or perceived costs of treatment can act as significant barriers to successful development, particularly if the contamination issues and their solutions are not identified early and integrated into the scheme for development of the site.

Contaminated Land is legally defined (from Section 78A(2) of Part IIA of the Environmental Protection Act 1990) as:

“any land which appears to the local authority in whose area it is situated to be in such condition, by reason of substances in, on or under the land, that:

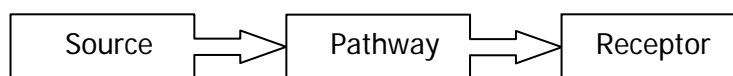
*a) significant harm is being caused or there is a significant possibility of such harm being caused; or*

*b) pollution of controlled waters is being, or is likely to be caused.”*

(Copies of the act are available from [www.hmsso.gov.uk](http://www.hmsso.gov.uk).)

## Pollutant Linkages

A key principle of the Part IIA regime is the pollutant linkage concept:



### Source

The contamination present in, on or under the land. In the majority of cases, contamination is most likely the result of a previous industrial or commercial activity, e.g. mining and landfilling of waste, that has taken place either on the site or on an adjacent site. There are several publications available which outline the types of

contamination that may be present based on the usage of a site. These include Potential contaminants for the assessment of land (CLR8) and the DoE series of Industry Profiles, both of which are available for download from the Environment Agency Website: <https://www.gov.uk/government/organisations/environment-agency>

### Pathway

The route by which contamination reaches the receptor, for example:

- Ingestion of contaminated soils.
- Inhalation of dusts and / or vapours.
- Direct contact with contaminated soils.

### Receptor

The living organism, ecological systems or property that may be harmed

Put simply, before a source of contamination (e.g. a disused gas works site) can cause a risk to a receptor there must be a pathway by which the receptor can come into contact with the contamination. Such pathways may include vapour inhalation, ingestion or skin contact. All three elements of the pollutant linkage (source, pathway and receptor) must be present in order for land to be identified as contaminated under the regime.

Part IIA is not directed to assessing risks in relation to a future use of the land that would require a specific grant of planning permission. This is primarily a task for the planning system, which aims to control development and land use in the future.

Where development is proposed on a site which may be contaminated, the developer is responsible for ensuring that development is safe and suitable for use for the purpose for which it is intended. A potential developer will need to satisfy the local authority that unacceptable risk from contamination will be successfully addressed through remediation without undue environmental impact during and following the development.

## **The Planning System**

The planning system uses a different definition for contaminated land, as outlined within planning guidance (PPS 23).

*“the actual or suspected presence of substances in, on or under the land may cause risks to people, properties, human activities or the environment, regardless of whether or not the land meets the statutory definition in Part IIA”*

The principle difference is that under the planning system, risks have to be assessed based upon the new or intended use of the land rather than the existing use.

## **Liaison with the Borough Council**

The actual or possible presence of contamination is a material planning consideration. It is necessary to determine whether there are likely to be any contamination issues on site prior to submitting an application for planning consent.

On any site where there is potential for contamination to influence the site or if the development is sensitive (schools, residential housing, hospitals etc) the Planning Officer will consult with Environmental Health about contaminated land issues. They will assess the application and may recommend that certain actions or conditions be imposed upon the development to ensure that the site is made suitable for its proposed end use, the safety of site workers, future site users and the environment (among others).

If the proposed use of a site is sensitive (e.g. allotments, residential use, schools) or there is a potential for contamination to affect the proposals, then a Preliminary Risk Assessment should be submitted to the Local Planning Authority (LPA) with your application. It is the developer's responsibility to establish the need for a Preliminary Risk Assessment and to give sufficient information to back up such a decision.

Where significant contamination is known or is likely to be present, it may be necessary to carry out site investigations before determining an application, as significant

contamination may limit the allowable land uses. Therefore it is strongly recommended that you undertake pre-application discussions in these situations.

When your application is approved it is likely that various planning conditions will have been applied, some of which may be in relation to contamination. It is very important to read these conditions carefully as they often require action from you and then approval from the council before development can take place. Appendix A contains example conditions set by Guildford Borough Council.

Contaminated land is a serious planning issue. Legal action can be taken by this authority (and other regulatory bodies) in cases of non-compliance. Actions that can be taken in order to enforce a contamination land condition include:

- Power to enter and investigate
- Power to stop the development if it is already in progress
- Requirement for post development remediation works prior to the site being put into use or occupied.
- Ability to demand the information requested by the condition.

### **Developer Responsibilities**

PPS23 clearly states that where development is proposed, the developer is responsible for ensuring that development is safe and suitable for use for the purpose for which it is intended. The developer is thus responsible for determining whether land is suitable for a particular development or can be made so by remedial action.

The aim of assessing and remediating Contaminated Land is to protect public health, the environment and controlled waters from contaminants present in the soil.

Official guidance relating to contaminated land in the UK promotes a risk-based approach to dealing with soil and ground water on a 'suitable for use' basis. Fundamental to the risk based approach is the source - pathway - receptor or pollutant linkage concept.

Where official guidance has been produced by government or other authoritative sources, the investigation and remediation of land should be carried out in accordance with those standards and recommendations. Care should be taken to select a competent and suitably experienced environmental consultant. This is fundamental to producing a credible and appropriate assessment.

In particular, the developer should carry out an adequate investigation to inform a risk assessment to determine:

1. Whether the land in question is already affected by contamination through source-pathway-receptor pollution linkages and how those linkages are represented in a conceptual model;
2. Whether the development proposed will create new linkages, e.g. new pathways by which existing contaminants might reach existing or proposed receptors (e.g. drilling, piling, services) and whether it will introduce new vulnerable receptors (e.g. residents); and
3. What action is needed to break those existing linkages and avoid creating new ones, deal with any unacceptable risks and enable safe development and future occupancy of the site and neighbouring land.

If the site investigation shows to the council's satisfaction that there is no contamination problem, then usually no further action will be necessary. Once this has been confirmed by the council in writing, you will be able to proceed with development. Should any unexpected contamination be found during development, work must cease and the Council informed immediately so that any remediation work needed can be agreed. Please note that any remediation work identified must be agreed prior to the commencement of construction.

Guidance on the content of reports can be found in the form of CLR11 – Model Procedures for the Management of Land Contamination, available from the Environment Agency ([www.gov.uk/government/organisations/environment-agency](http://www.gov.uk/government/organisations/environment-agency)).



The developer should be aware that failure or omissions on his part could lead to liability under Part IIA or, when implemented, the Environmental Liability Directive (2004/35/EC) in addition to planning enforcement.

### **Submission of Information to the Council**

All reports should be sent directly to planning where the case officer will forward copies to the appropriate consultees. If it is necessary to communicate directly with the Environment Agency or other consultee, it is important to copy the planning officer in on all correspondence. Please check with your planning officer about the submission format (electronic or hardcopy) of reports and number of copies required by the Local Planning Authority.

Reports should be prepared by independent and suitably qualified consultants / contractors. The council will reject reports and/ or require further information in cases where work has not been carried out in accordance with good practice or fails to establish confidence in the findings and conclusions reached. Problems most frequently arise where:

- work starts without establishment of effective dialogue and the Council's specific agreement to the proposals
- work deviates from agreed methods without prior agreement
- the development begins before all assessment work and remediation proposals are agreed with the Council

Withholding information may cause a delay, and it is the applicant's responsibility to ensure the council has all the information they need at all times so that decisions can be made as quickly as possible.

In the site investigation shows to the council's satisfaction that there is no contamination problem, then usually no further action will be necessary. Once this is confirmed by the council in writing, you will be able to proceed with development.

Should any unexpected contamination be found during development, work must cease and the Council informed immediately so that any remediation work needed can be agreed. Please note that any remediation work identified must be agreed prior to the commencement of construction.

Failure to comply with the requirements of planning conditions may have the following consequences:

- Delay in progressing the development
- Enforcement action by the planning authority
- An increase in costs if further investigation is required
- The land being determined as Contaminated Land under Part IIA of the Environmental Protection Act 1990
- Problems with the future sale of the land or buildings

The council wishes to avoid these circumstances and recommends most strongly that developers maintain close and effective dialogue at all stages of the process. It must also be stressed that the responsibility for completing work and providing information rests entirely with the developer and their advisers where appropriate.

## Appendix A

### Example Contaminated Land Planning Conditions

#### Condition 1 (Investigation of ground conditions)

Before development commences the following shall be submitted to the Local Planning Authority:

- The results of a detailed Phase One survey, including historic investigation and ground conditions to ascertain whether the site supports any soil or water contamination.
- If the LPA consider that further investigation of the site is necessary, a detailed site investigation must be carried out by a suitably qualified and accredited consultant/contractor in accordance with a Quality Assured sampling and analysis methodology and must include relevant sub-surface, soil gas and groundwater sampling together with the results of analysis and a risk assessment to any receptors will be detailed.
- Details of any remediation scheme required to remediate the site to a standard suitable for use, including works to address any unsuspected contamination.

Reason: To ensure any contamination of the site is remediated and to protect existing/proposed occupants of the applicant site and/or adjacent land.

#### Condition 2 (Remediation)

Any remediation scheme submitted in accordance with Condition 1 (above) shall be carried out as detailed in the applicants submission. Documentary proof shall be provided to the Local Planning Authority together with a quality assurance certificate to show that the works have been carried out in full accordance with the approved remediation strategy. Details of any post remediation sampling and analysis to show the site has reached the required clean-up criteria shall be included in the closure report together with the necessary documentation detailing what waste material has been removed from the site before the development hereby permitted is occupied by any person not directly involved in constructing the development.

Reason: To ensure any contamination of the site is remediated to a 'suitable for use' standard and to protect existing/proposed occupants of applicant site and/or adjacent land.

**Condition 3 (Unexpected Contamination)**

If during development any suspect contamination, buried structures or material not previously identified, is found to be present on the site then no further development (unless otherwise agreed in writing with the Local Planning Authority) shall be carried out until the developer has submitted (and obtained written approval from the Local Planning Authority) a written remediation scheme. This scheme shall detail the nature and extent of unsuspected contamination and how it shall be dealt with.

Reason: To ensure any contamination of the site is remediated to a 'suitable for use' standard and to protect existing/proposed occupants of applicant site and/or adjacent land.

**IMPORTANT**

These are example conditions.

If a contaminated land condition is applied to your development please read the condition carefully as it is likely to have been changed to reflect the individual conditions at your site.

Other situations that may be covered by a contaminated land condition include long term monitoring of landfill gas.

## Appendix B

### Checklist for Developers - Investigation and Remediation Of Potentially Contaminated Sites

#### Preliminary Risk Assessment / Desk Study

Has the following been considered?

- |           |  |                              |                             |
|-----------|--|------------------------------|-----------------------------|
| <b>1</b>  | Purpose and aims of the study  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>2</b>  | Site location and layout plans   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>3</b>  | Assessment of the current site use including site reconnaissance survey (walkover)   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>4</b>  | Appraisal of site history  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>5</b>  | Details of proposed future use and proposed layout plans   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>6</b>  | Assessment of environmental setting:   |                              |                             |
|           | • Geology, hydrogeology and hydrology  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|           | • Information on coal workings (where appropriate) and other mining or quarrying activities  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|           | • Information from Environment Agency on abstractions, pollution incidents, water quality classification, landfill sites, prescribed processes Part A etc                  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|           | • Information from Local Authority on former landfill site, contaminated land, hazardous substances, private water supplies, prescribed processes Part A(2) and Part B etc | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|           | • Information from any other appropriate bodies (e.g. SSSI, SBI etc)   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>7</b>  | Review of any previous contamination studies (desk-based or intrusive) or remediation works  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>8</b>  | Preliminary (qualitative) assessment of risks  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|           | • Appraisal of potential contaminant sources, pathways and receptors   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|           | • Conceptual site model  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|           | Identification of contaminants of concern  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>8</b>  | Discussion of uncertainties and gaps in information  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>9</b>  | Recommendations for further works, if necessary (intrusive site investigation and quantitative risk assessment)  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>10</b> | All relevant data sources appended where possible (e.g. search responses, historical mapping)  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

## Site Investigation and Risk Assessment

Has the following been considered?

- |          |  |                              |                             |
|----------|--|------------------------------|-----------------------------|
| <b>1</b> | Purpose and aims of the study  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>2</b> | Site location and layout plans   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>3</b> | Details of proposed future use and proposed layout plans   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>4</b> | Results from the Preliminary Risk Assessment / Desk Study (relevant details such as the conceptual model should be included in the main body of the report)  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>5</b> | Site investigation strategy including  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|          | <ul style="list-style-type: none"> <li>• Rationale for investigation and justification for positioning of exploratory locations (including plan showing exploratory locations)</li> <li>• Exploratory methods used (e.g. trial pitting, window sampling) and justification</li> </ul>  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>6</b> | Site sampling strategy including   |                              |                             |
|          | <ul style="list-style-type: none"> <li>• Rationale for strategy</li> <li>• Details of in-situ tests and geotechnical tests required</li> <li>• Description and explanation of monitoring programmes for gas, groundwater and surface waters (upstream and downstream conditions should be represented) where relevant.</li> <li>• Details of information to be recorded such as gas types, weather conditions, depth of groundwater (metres below ground level and AOD) and frequencies of sampling.</li> <li>• Monitoring and sampling location plan</li> </ul>     | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>7</b> | Analytical strategy including  |                              |                             |
|          | <ul style="list-style-type: none"> <li>• Rationale for selection of analytical parameters (based on contaminants of concern identified in the Preliminary Risk Assessment).</li> <li>• Justification for selection of samples to be analysed</li> <li>• Description of methods used for collecting, preserving and transporting the samples to the analytical laboratory.</li> <li>• Description of chemical analysis, in accordance with MCERTS performance standard for soil quality assurance and quality control requirements for laboratory analysis</li> </ul> | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

- 8** Results and findings of investigation
- Description of site works and on-site observations Yes  No
  - Description of the ground conditions encountered (soil and groundwater regimes, including made ground) Yes  No
  - Summary tables of laboratory analyses, site monitoring and geotechnical test results Yes  No
  - Evaluation and discussion of site investigation results and contamination identified Yes  No
- 9** Revised conceptual model (identification, confirmation and discussion of all relevant pollutant linkages) Yes  No
- 10** Risk Assessment including
- Rationale for chosen risk assessment approach Yes  No
  - Statistical tests for contaminated soils including mean value test and maximum value test as detailed in CIEH/CLAIRE document (Guidance on Comparing Soil Contamination Data with a Critical Concentration), introduced after withdrawal of CLR7 Yes  No
  - Assessment criteria selected for the site with justification for all criteria used and UK compliance Yes  No
  - Constraints and limitations relating to data quality and risk assessment method Yes  No
  - Identification of pollutant linkages that present an unacceptable risk of harm to human health, controlled waters, buildings, property and the wider environment (current and future use) Yes  No
  - Results of risk estimation if detailed quantitative risk assessment is undertaken Yes  No
  - Evaluation of unacceptable risks to human health, controlled waters, buildings, property and the wider environment, taking into account both the current use of the site and details of the proposed development. Yes  No
- 11** Recommendations for remediation, including a description and justification of next steps proposed at the site e.g. carry out an Options Appraisal for pollutant linkages that present an unacceptable risk, assess need for further investigation / delineation works Yes  No
- 12** All relevant data sources appended where possible (e.g. laboratory analytical reports, risk assessment worksheets, statistical test results) Yes  No

Remediation Statement (to be submitted *before* remediation commences)

Has the following been considered?

- |          |  |                              |                             |
|----------|--|------------------------------|-----------------------------|
| <b>1</b> | Objectives of remediation or protective works  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>2</b> | Detailed outline of the works to be carried out, including   |                              |                             |
|          | • Description of ground conditions   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|          | • Type, form and scale of contamination to be remediated   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|          | • Remediation methodology, including technical and scientific basis  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|          | • Proposed site zoning and phasing of remediation works  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|          | • Approximate timescales to carry out remedial works   |                              |                             |
|          | • Expected durability of the proposed solution   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|          | • Measures to prevent pollution or nuisance (e.g. odour and noise) caused by remediation activities at the site  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|          | • Constraints and limitations to remediation   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>3</b> | Assessment of requirements for consents, agreements, permits and licences (discharge consents, waste management licence, mobile plant, Part B authorisations, land access etc) | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>4</b> | Details of how any necessary variations from the approved remediation statement <i>arising during the works</i> will be dealt with   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>5</b> | Site management procedures to protect site workers, neighbours, the environment and amenity during works including where appropriate:  |                              |                             |
|          | • Health and safety procedures   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|          | • Dust, noise and odour controls   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|          | • Control of surface water run-off and dewatering  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|          | • Management / control systems to prevent contamination due to site activities   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>6</b> | Details of how the works will be validated to ensure the remediation objectives have been met, including:  |                              |                             |
|          | • Sampling strategy including validation testing frequencies and determinands  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|          | • Use of on-site observations, visual / olfactory evidence   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|          | • Chemical analysis / monitoring data  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|          | • Proposed clean-up criteria (i.e. contaminant concentrations)   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>7</b> | All relevant data sources appended where possible (e.g. laboratory analytical reports, risk assessment worksheets, statistical test results)                                   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |



Validation of Remediation (to be submitted upon completion of remediation)

Has the following been considered?

- |           |   |                              |                             |
|-----------|---|------------------------------|-----------------------------|
| <b>1</b>  | Objectives of remediation or protective works   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>2</b>  | Include information as per 2 to 7 of the Remediation Statement (above), updated where required  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>3</b>  | Site preparation and operational constraints  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>4</b>  | Relevant consents, agreements, permits and licences (discharge consents, waste management licence, mobile plant, Part B authorisations, land access etc) and evidence of compliance | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>5</b>  | Updated timescales and programme of works   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>6</b>  | Action plans for unexpected contamination and other unforeseen conditions   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>7</b>  | Details of all contractors (including qualifications) and work carried out by each  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>8</b>  | Details and justification of any changes from original Remediation Statement  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>9</b>  | Substantiating data including   |                              |                             |
|           | • Laboratory and in-situ test results   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|           | • Monitoring results for groundwater and gases  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|           | • Summary data plots and tables relating to clean-up criteria   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|           | • Plans showing treatment areas   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|           | • Photographic and other media records  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
|           | • Waste management details and records (e.g. details of disposal to appropriately licensed facilities)  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>10</b> | Confirmation that remediation objectives have been met  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| <b>11</b> | Details of any ongoing or long term monitoring requirements   | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

This checklist has been produced based on likely planning requirements and best practice. Not all items within the checklists will necessarily be required, however, you are strongly advised to include all relevant information and check with the Local Authority if you are unsure of requirements.

In order to promote a consistent approach, large extracts and modifications to the checklist within the Environment Agency Guidance on Requirement for Land Contamination Reports (2005) have been used.

Additional information on contaminated land management and a framework for structured contaminated land decision making can be found within CLR11 – Model Procedures for the Management of Land Contamination; [www.gov.uk/government/organisations/environment-agency](http://www.gov.uk/government/organisations/environment-agency)

## Appendix C

### Key Reference Documents

British Standards Institution, 1999, **Code of Practice for Site Investigations**, BS5930

British Standards Institution, 2001, **Investigation of Potentially Contaminated Sites – Code of Practice and its Investigation**, BS10175

Building Research Establishment, 2001, **Protective measures for housing on gas contaminated land**, BRE Report 414

Chartered Institute of Environmental Health, 2001, **Local Authority Guide to the Application of Part IIA of the Environmental Protection Act 1990**, (Available online at [www.cieh.org/library/Knowledge/Environmental\\_protection/LocalA2007.pdf](http://www.cieh.org/library/Knowledge/Environmental_protection/LocalA2007.pdf) )

Construction Industry Research and Information Association, 1995-1998, **Remedial Treatment for Contaminated Land, 12 Volumes**, CIRIA Special Publications 101-112

Construction Industry Research and Information Association, 1995, **Protecting development from methane**, CIRIA Report 149

Construction Industry Research and Information Association, 1996, **Barriers liners and cover systems**, CIRIA Special Publication 124

Construction Industry Research and Information Association, 2001, **Remedial Processes for Contaminated Land – Principles and Practice**, CIRIA C549

Construction Industry Research and Information Association, 2006, **Assessing risks posed by hazardous ground gases to buildings**, CIRIA C659

Department of Environment, 1995, **Industry Profiles (various titles)**, (Available online at <https://www.gov.uk/government/organisations/environment-agency>)

Department of Environment, Transport and Regions, 2000, **Guidelines for Environmental Risk Assessment and Management**, Revised Departmental Guidance

Department for Environment, Food and Rural Affairs, 2006, **Environmental Protection Act 1990: Part IIA, Contaminated Land, Circular 01/2006.**

Environment Agency, 1998, **Policy and Practice for the Protection of Groundwater** (Second Edition)

Environment Agency, 1999, **Methodology for the Derivation of Remedial Targets for Soil and Groundwater to Protect Water Resources**, R&D Publication 20

Environment Agency & NHBC, 2000, **Guidance for the Safe Development of Housing on Land Affected by Contamination**, R&D Publication 66

Environment Agency, 2000, **Cost-Benefit Analysis for the Remediation of Land Contamination**, R&D Technical Report P316

Environment Agency, 2001, **Guide to Good Practice for the Development of Conceptual Models and the Selection and Application of Mathematical Models of Contaminant Transport Processes in the Subsurface**. NC/99/38/2

Environment Agency, 2002, **Toxicological Data (Current SGVs withdrawn)** (Available at: <https://www.gov.uk/government/organisations/environment-agency>)

Environment Agency, 2008, Human health toxicological assessment of contaminants in soil (Science Report SC050021/SR2) (Acrobat, 372KB, 1 min)

Environment Agency, 2008 Updated technical background to the CLEA model (Science Report SC050021/SR3) (Acrobat, 1216KB, 8 minutes)

Environment Agency, 2004, **Model Procedures for the Management of Land Contamination**, CLR11 (Available at: <https://www.gov.uk/government/organisations/environment-agency>)

Environment Agency, 2005, **The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils**, Science Report P5-080/TR3

Environment Agency, 2005, **Environment Agency Guidance on Requirements for Land Contamination Reports**

Health & Safety Executive, 1991, **Protection of Workers and the General Public during the Development of Contaminated Land**

National House Building Council (NHBC), 1999, NHBC Standards Chapter 4.1, **Land Quality – Managing Ground Conditions**

Office of the Deputy Prime Minister, 2004, **Planning & Pollution Control Annex 2: Development of Land Affected by Contamination**, Planning Policy Statement 23 (Available for free download on-line at:

[http://www.communities.gov.uk/pub/924/PlanningPolicyStatement23PlanningandPollutionControlAnnex2DevelopmentonLandAffected\\_id1143924.pdf](http://www.communities.gov.uk/pub/924/PlanningPolicyStatement23PlanningandPollutionControlAnnex2DevelopmentonLandAffected_id1143924.pdf))

Office of the Deputy Prime Minister, 2004, **The Building Regulations 2000, Approved Document C – Site Preparation and Resistance to Contaminants and Moisture**, (Available on-line at [http://www.planningportal.gov.uk/uploads/br/BR\\_PDFs\\_ADC\\_2004.pdf](http://www.planningportal.gov.uk/uploads/br/BR_PDFs_ADC_2004.pdf) )

Scotland and Northern Ireland Forum for Environmental Research (SNIFFER), 2003, **Method for Deriving Site-Specific Human Health Assessment Criteria for Contaminants in Soils**, LQ01

**Please note that several of the reference documents contain a comprehensive list of other useful publications associated with contaminated land, particularly CLR11 Model Procedures for the Management of Land Contamination.**

**Links were correct as of 14 November 2008**