LAND AFFECTED BY CONTAMINATION

Technical Guidance for Applicants and Developers

Second Edition

Essex Contaminated Land Consortium

THURROCK COUNCIL

Environment Agency

Rochford District Council

Chelmsford Borough Council

Braintree District Council

castlepoint
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MALDON DISTRICT COUNCIL

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It's Our Community

December 2007 v2

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1. Introduction

1.1 As part of the Development Control process the Council aims to bring derelict land back into use. Some sites, particularly those that have been used for industrial processes, may be affected by contamination. This may include soils contaminated by chemicals; migration of contaminants to ground and surface waters; and the production of hazardous gases.

1.2 The appropriate assessment of the risks posed by potentially contaminated sites and the subsequent provisions for agreed remediation and validation is an integral part of the Development Control process. There are now also liabilities to consider arising from the final condition of the site, to prevent it from being designated in the future as contaminated land, as defined by Part IIA of the Environmental Protection Act 1990 (See 7).

1.3 Additionally, a full warranty from the NHBC or other approved inspectors will be withheld until sufficient information is provided to demonstrate to them that there is an acceptable risk to health, property and the environment. Until such time, mortgage funds cannot be released and legal completion or sign-off will be prevented.

1.4 The Essex Contaminated Land Consortium, which consists of representatives from all Essex Local Authorities and the Environment Agency, decided that there was a need to produce a clear and informative guide to developers and applicants relating to how to deal with land contamination. By doing this, it would also ensure a consistent approach across the County.

1.5 The purpose of this guide is to provide planning agents, developers and other applicants with details of the type and extent of investigations and decontamination schemes required by the Council for these sites. This is so that the Council can discharge its statutory responsibilities relating to Planning and Building Regulation[1] applications, whilst addressing relevant environmental health issues. This will include generating and enforcing appropriate planning conditions relating to contamination in any permission. Please note that this guidance should be read in conjunction with:-

- DEFRA & the Environment Agency's Model Procedures for the Management of Land Contamination (CLR11) ; and
- Planning Policy Statement 23.

1.6 The Council will also consult and have regard to comments made by other statutory bodies, principally the Environment Agency. The Agency has many regulatory powers relating to the protection of ground and surface waters. They are also primary consultees for Local Authorities when determining sites as contaminated land under the Environmental Protection Act 1990.

1.7 To make the application process more efficient, the Council will aim to provide as much information as possible about dealing with contamination. It should be appreciated, however, that the assessment of land affected by contamination is a complex subject. Each site will be judged separately and additional considerations may apply.

1.8 It is important to note that reports which fail to address all the relevant issues referred to in this technical guidance will be rejected. All Essex Local Authorities encourage early consultation and submission of environmental reports.

1.9 It is also important to note that an Envirocheck, Sitescope or similar report, submitted in isolation, **will not** be sufficient to provide all of the information required by the Local Authority. However, it would be acceptable for such a report to be included as part of the more detailed submission.

1.10 A flow chart summarising the stages involved is included in Appendix 2.

[1]This guidance conforms to the revised Approved Document C, published 1 April 2004

2. Site Characterisation & Risk Assessment

2.1 Although contamination is widespread, it may not always be present in a form that would pose an unacceptable risk to human health, controlled waters, property, ecological systems and the environment. Therefore, it would be unreasonable to require every application to be supported by an intrusive investigation.

2.2 To overcome this issue, the Council's requirements to characterise the site for contamination will be proportionate to the risk of harm perceived in the light of information available. Therefore, for all proposed residential developments, a minimum of a Phase 1 desk study report **must** be submitted in support of the planning application. Depending on the findings of this report, for all sites where contamination is known, or there is a reasonable suspicion of contamination i.e. former industrial, commercial, trade or agricultural use, or where there are indications of contamination, a Phase 2 intrusive investigation report and remediation statement may also be required.

2.3 The objective of the Phase 1 & Phase 2 investigations is to establish a risk assessment, to enable the applicant and the regulators to clearly define the risk of harm to existing and proposed end users and other environmental receptors from contamination.

2.4 Competent and experienced persons must carry out all elements of the site characterisation. Usually, this would mean commissioning consultants or specialists. These persons must be familiar with all elements of modern risk assessment and site investigation techniques. They should also be familiar with current UK policy and the legislative framework surrounding land affected by contamination.

2.5 The UK Risk Assessment Framework is based on a staged or tiered approach:

- Tier 1 Preliminary Risk Assessment
- Tier 2 Generic Quantitative Risk Assessment (GQRA)
- Tier 3 Detailed Quantitative Risk Assessment (DQRA)
  As set out in CLR11.

2.6 All risks identified must be evaluated fully, to ensure that justifiable conclusions about the nature and level of risk have been drawn. This will include use of any non-UK standards and adjustments made to those models. Any recommendations made as a result of the assessments must therefore be defensible. The risk evaluation will also contain any uncertainties surrounding the assessment.

Phase 1 – Desktop Study, Site Walkover and Preliminary Risk Assessment

2.7 Applicants should familiarise themselves with the site (and surrounding areas), its former use and its potential to cause contamination. Failure to demonstrate this may result in the Planning Authority refusing an application, as important information could be missed.

2.8 The object of the study is to formulate a Conceptual Model and Preliminary Risk Assessment (Tier 1). The study will include:

- A plan of the proposed site layout;
- Site reconnaissance or walkover;
- A physical site description including geology, hydrogeology, etc;
- The condition of soil and vegetation;
- The condition of structures on site;
- Review of current and historical maps;
- Previous, present and proposed uses of the site and direct vicinity;

- Previous and current industrial processes carried out on site;
- Details of any waste disposal practices;
- Details of spillage or pollution incidents;
- Any excavation and infilling activities;
- A review of any previous investigations;
- Initial sampling of soils, water and gas where deemed appropriate; and
- An appreciation of all potential receptors on and outside the site.

2.9 During the desktop study, it will be expected that initial contact is made with the Local Authority.

2.10 From the findings of this study, an initial "Conceptual Model" will be produced. This is usually in the form of a diagram or table that illustrates any potentially significant **sources** of contamination; **pathways** through which contaminants can travel; and **receptors** that ultimately can be affected.

2.11 The risk assessment derived from the Conceptual Model will indicate whether it is necessary for it to be followed up by a further "Intrusive" or "Phase 2 Investigation" and Risk Assessment (Tier 2).

2.12 The Desktop Study should be submitted to the Council as a written report **prior** to the commencement of a Phase 2 investigation. At this stage, the Council or Environment Agency may request further information or clarification of points.

NOTE: PPS23 states that where there is a suspicion or knowledge of contamination at a site, a planning application **must** be accompanied by the minimum of a desk study, site walkover and a preliminary risk assessment, including a conceptual model.

Phase 2: Intrusive Site Investigation

2.13 If the Phase 1 study indicates that there is a potential risk of harm from contamination, an investigation shall be undertaken to look at the elements of the Conceptual Model. Therefore, the Phase 2 Investigation should seek to clarify the findings of the Phase 1 Investigation.

2.14 This is the opportunity for further consultation with the Environment Agency on matters relating to ground and surface waters.

2.15 There may also be the need to monitor off-site, to assess impacts of migrating contaminants.

2.16 Where the potential for migration of ground gases has previously been identified, further investigations will be required. These investigations will need to be carried out in accordance with suitable risk assessment methods. The following are examples of guidance documents available:-

- Assessing risks posed by hazardous ground gases to buildings, CIRIA;
- Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present, NHBC, RSK Group Plc; and
- Ground Gas Handbook, CIEH.

2.17 It is strongly recommended that further contact with the Local Authority is made prior to undertaking any gas migration investigations.

2.18 The intrusive investigation must be carried out by suitably competent and experienced consultants or specialists. This will include access to specialist contractors and engineers.

2.19 The investigation including sampling techniques should be carried out in accordance with *BS10175:2001 Investigation of potentially contaminated sites – code of practice* & "CLR 11."

2.20 Analysis of all samples shall be by accredited techniques. Where available, laboratory analysis of chemical samples shall be by methods accredited to the Environment Agency Monitoring Certification Scheme (MCERTS) standard.

2.21 When completed, the results of the investigation should be compared against suitable criteria. In the first instance, exposure to human health will be assessed with reference to the Soil Guideline Values (SGVs). Where these are unavailable for a particular substance, it is expected that the "Generic Assessment Criteria for Human Health Risk Assessment" (CIEH/LQM) should be used.

Values using the CLEA UK Exposure Model can be derived in accordance with the "acceptable risk" approach.

2.22 Where a substance is not covered by the above, other Risk Assessment tools will be considered. However these must be fully justified and conform to current UK Policy. Please note that models are also specific to certain land uses and receptors.

2.23 The following are examples of risk assessment tools that are currently available:

- CLEA UK
- Scotland and Northern Ireland Forum For Environmental Research (SNIFFER) *Framework for Deriving Site-Specific Human Health Assessment Criteria for use in the Assessment and Management of Contaminants in Soil*
- Risk Based Corrective Action (RBCA) Toolkit (pronounced "Rebecca" – USEPA)
- RISC Human (RIVM)

NB. From December 2002 trigger and action levels as laid down by the Interdepartmental Committee Reclamation of Contaminated Land (ICRCL) Guidance Note 59/83 have been withdrawn and ***will not be accepted****. However, phytotoxicity levels stated in ICRCL Guidance Note 70/90 are still current at the time of publication.*

2.24 Risks to ground and surface waters should be assessed using the Environment Agency's *Methodology for the Derivation of Remedial Targets for Soil and Groundwater to Protect Water Resources*. Other models such as Consim and RBCA, may be acceptable. Please contact the Environment Agency for further information.

2.25 Underground structures such as foundations, fuel tanks, pipe work and archaeological sites need to be identified. Archaeological sites are treated as contamination receptors and advice from local and national agencies such as English Heritage may be required.

2.26 After the completion of the investigation works, a report detailing the methodologies used in the investigation, results, conclusions and recommendations will be submitted to the Local Authority. The report will also include:-

- A rationale for sampling;
- Field sampling techniques utilised;
- Scaled sampling plans;
- Borehole logs and soil profile;
- Range of contaminants analysed;
- Plan showing location of significant contamination;
- Any uncertainties relating to the conclusions; and
- Recommendations.

2.27 After the Phase 2 investigation has been completed, the preliminary conceptual model and risk assessment must be reviewed to see if the potential risks to human health, controlled waters and the environment have been realised to the satisfaction of the Local Authority and the Environment Agency.

3. Remediation Scheme

3.1 Where unacceptable risks to human health, property or the environment have been identified during Phases 1 and 2, a report outlining suitable remediation scheme(s) must be produced, in order to manage these risks for the proposed use of the land. This report should include information on how the works will be validated, to ensure that the remediation objectives have been met. This report must be submitted to, and agreed by, the Local Authority, **before** any work commences.

3.2 Where remediation of ground and surface waters are required, work will also need to be agreed by the Environment Agency. Details of the work shall be submitted in writing to the Council and the Environment Agency.

3.3 If any ground works are required to be undertaken prior to the commencement of the remediation scheme, they must be approved by the Local Planning Authority.

3.4 Where remediation includes importation of soils onto the site, either for gardens or soft landscaping purposes, these must be suitable for use. The Local Authority will require you to provide documentation before importation of such soils so that you are able to demonstrate this. The Local Authority encourage you to contact us prior to the importation of soils so that the details can be agreed. These requirements are set out in Appendix 1.

3.5 Suitably trained and competent persons shall be appointed to oversee the remediation works. They shall also be responsible for the safety of site workers and the public. These procedures must be in place before the work commences.

3.6 The appointed person shall be responsible for the documented identification, handling, storage and fate of contaminated waste. There may also be a requirement for a waste management licence or permit. Please contact the Environment Agency for advice.

3.7 Any unexpected contamination or pathways that become evident during the development of the site shall be reported to the local planning authority immediately. The risk assessment shall be reviewed in the light of this.

3.8 The Council will also have preference to the use of alternative, more sustainable remediation techniques, as opposed to the “dig-and-dump” method. Off-site disposal of grossly contaminated soils and waters may still be necessary. However, current technology allows soils and waters contaminated to certain levels to be treated for reuse. Techniques include:-

- In-situ and ex-situ bioremediation of soils;
- In-situ enhanced natural attenuation of groundwater;
- Thermal desorption;
- Monitored natural attenuation;
- Air Sparging;
- Permeable Reactive Barriers;
- Soil Washing; and
- Solid Phase Biopiles.

3.9 The Environment Agency should be consulted where such techniques are proposed as certain remedial activities may require mobile plant or waste management licences.

3.10 Although these methods may take more time, there is often a cost benefit associated with them e.g. waste disposal and transportation costs. They will also avoid pollution caused by excessive vehicle movements and the need for landfill.

4. Validation

4.1 After completion of the remediation works, a validation report must be submitted to the Council for approval, **before construction begins** (unless the remediation forms part of the construction). The validation report demonstrates whether the agreed remediation objectives have been met. This may include:

- A summary of the risks that have been managed;
- Validation sampling of any imported topsoil and certification of the source of the material (including appropriate analysis);
- Validation of soil horizons where plants and vegetables could be grown;
- Certification of any gas protection measures installed in individual plots;
- 'Duty of Care' waste disposal documentation; and
- Remediation to be agreed on a site specific basis.

4.2 There may be a requirement for future monitoring of the site, to verify whether the remediation has been successful, particularly where on-site treatment processes have been used.

4.3 Subject to the findings of the validation report, the Council may require further works, including sampling and remediation to be undertaken.

4.4 When the Council is satisfied that the site has been remediated to an acceptable standard and is suitable for use, the applicant and / or the developer will be expected to sign a Certificate, to confirm that the site has been remediated in accordance with the scheme agreed by themselves and the Council (Appendix 3).

5. Local Authority Considerations

5.1 The Local Authority will consider the following prior to or on receipt of the application:

Site Characterisation & Risk Assessment

- Has the site been determined as contaminated land under Part IIA of the Environmental Protection Act 1990?
- Is the site known or suspected of being contaminated?
- Does the Council possess any information about the site?
- Are the previous uses likely to have left the site in a contaminated state?
- Does the site require investigation prior to the application being determined?
- Have competent persons carried out the investigation?
- Has the applicant gathered sufficient information?
- Has sufficient sampling been undertaken?
- What levels of confidence and uncertainty are included with the results?
- Has an appropriate laboratory been used to carry out the analyses?

- Has the Environment Agency been consulted regarding ground & surface water contamination?
- Have suitable threshold criteria been used?
- Does the condition of the site pose an acceptable risk?
- Has the applicant met the objectives set by the Council?

Remediation & Validation

- Does the site require remediation for its proposed use?
- Can the design of a remediation scheme be conditioned or is it required before the permission is determined?
- Will the scheme render the site suitable for its end use?
- Have all sustainable remediation techniques been considered?
- Has the Environment Agency been consulted regarding waste management practices?
- Does the site require post-development monitoring?
- Has a monitoring scheme been agreed?
- Has the developer complied with the agreed scheme?
- Will there still be liabilities relating to Part IIA of the Environmental Protection Act 1990?
- Has the post remediation sampling and analysis been carried out sufficiently for validation?
- Are there any uncertainties remaining?
- Is all the necessary documentation attached to the validation report?

6. General Requirements

6.1 There are some matters that an applicant has to consider for all parts of the investigation and remediation.

Competency

6.2 Care must be taken to ensure that additional pollutant linkages are not created during any works carried out at the site. This could result in the site being determined as contaminated under Part IIA of the Environmental Protection Act 1990. Particular care must be taken when any piling is necessary. Piling can create direct pathways into groundwater; fissures in the strata may allow the migration of gases; may risk exposing site workers to contaminated arisings. This highlights the need for specialist advice for all parts of the investigation. The Local Authority encourage you to contact us prior to the importation of soils so that the details can be agreed.

6.3 Many organisations feel able to complete part of the assessment (usually the desktop study). The Council will have regard both to the content of reports and to professional experience, affiliation and demonstrable expertise. A failure to demonstrate this could lead to the report being rejected.

6.4 A specialist consultant should be commissioned to carry out all aspects of the investigation. He/she should be able to demonstrate:-

- Experience;
- Technical expertise in site investigation and remediation;
- Familiarity with current UK policy relating to contaminated land, and associated key guidance documents;

- Familiarity with the legal framework surrounding contaminated land;
- Knowledge in the use and application of best practice techniques; and
- Full Quality Assurance and Quality Control.

6.5 In all cases, all reports should be rational, ordered and in sufficient detail to demonstrate a logical progression of the assessment procedure. The reports should be clear and avoid excessive use of scientific terminology. They should also include a summary written in non-technical language.

Health and Safety

6.6 The developer is responsible for ensuring that site workers and members of the public are protected from the potential effects of contamination during the entire process. Enforcement for health and safety matters on construction sites is the responsibility of the Health and Safety Executive (HSE).

7. And finally…

7.1 The applicant is responsible for:
(a) providing sufficient correct information to ascertain whether a site is contaminated and that it has successfully been decontaminated. Many of the decisions made by the Council will be on the basis of the information that has been provided to it and,
(b) the safe development and secure occupancy of the site.

Part IIA of the Environmental Protection Act 1990

7.2 Local authorities are obliged to identify and have land remediated where contamination is causing unacceptable risks to human health and the wider environment, assessed in the context of its current land use and circumstances of the land.

7.3 Such land is determined "contaminated land" which is defined under Section 78A(2) of the Act as:

"land which appears to the Local Authority to be in such a condition, by reason of substances in, on, or under the land, that significant harm is being caused, or there is a significant possibility of such harm being caused; or pollution of controlled waters is being, or is likely to be caused."

7.4 "Harm" is subsequently defined as:

"harm to the health of living organisms or other interference with the ecological systems of which they form part and, in the case of man, includes harm to his property."

7.5 Therefore, should there be any failure to remediate land to a state that removes the risks that should have been identified in any investigation, remediation may be enforced post-development, at the expense of those persons deemed "appropriate" at the time, as defined by the Act.

7.6 Section 78F(2) of the Environmental Protection Act 1990 defines "appropriate persons" as those who have caused or knowingly permitted a pollutant to be in, or under the land. As such they may be liable for the remediation of the site if it is subsequently determined as contaminated land by the Local Authority. However, there are also circumstances under which the current owner or occupier of the contaminated land in question is an appropriate person.

8. References and Useful Sources of Information

British Standards Institution, *BS10175:2001 Investigation of potentially contaminated sites – code of practice, 2001*

CIEH/LQM, *Generic Assessment Criteria for Human Health Risk Assessment,* Nathanail et al, Land Quality Press, 2006

CIRIA, *C659 - Assessing Risks Posed by Hazardous Ground Gases to Buildings,* Wilson et al, 2006

DEFRA & Environment Agency, *Contaminants in Soil: Collation of Toxicological Data and Intake Values for Humans*, Environment Agency, 2002

DEFRA & Environment Agency, *Soil Guideline Values*, Environment Agency R&D Publication, 2002

DEFRA & Environment Agency, *Model Procedures for the Management of Land contamination. Contaminated Land Report 11 (CLR11)*, DEFRA, 2004

DEFRA, *Circular 01/2006. Environmental Protection Act 1990: Part 2A. Contaminated Land. September 2006,* The Stationery Office, 2006.

DoE, DEFRA, Environment Agency et al, *Contaminated Land Report (CLR) Series, Doe*, DEFRA, EA et al, 1994-2007

Environment Agency, *Cost Benefit Analysis in the Remediation of Contaminated Land Environment Agency Technical Record No.P316*, Environment Agency, 1999

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

Environment Agency, *Guidance on the Application of Waste Management Licensing to Remediation (version 2.0)*, January 2001

NHBC & Environment Agency, *Guidance on the Protection of Housing on Contaminated Land*, Environment Agency R&D Publication (66), 2000

ODPM, *Approved Document "C" – Site Preparation and Resistance to Contaminants and Moisture,* 2004 edition

ODPM, *Planning Policy Statement 23 (PPS23): Planning and Pollution Control (Annex 2)*, 2004

Scotland & Northern Ireland Forum For Environmental Research (SNIFFER) *Framework for Deriving Site-Specific Human Health Assessment Criteria for use in the Assessment and Management of Contaminants in Soil* (SNIFFER project ref. LQ01) April 2003

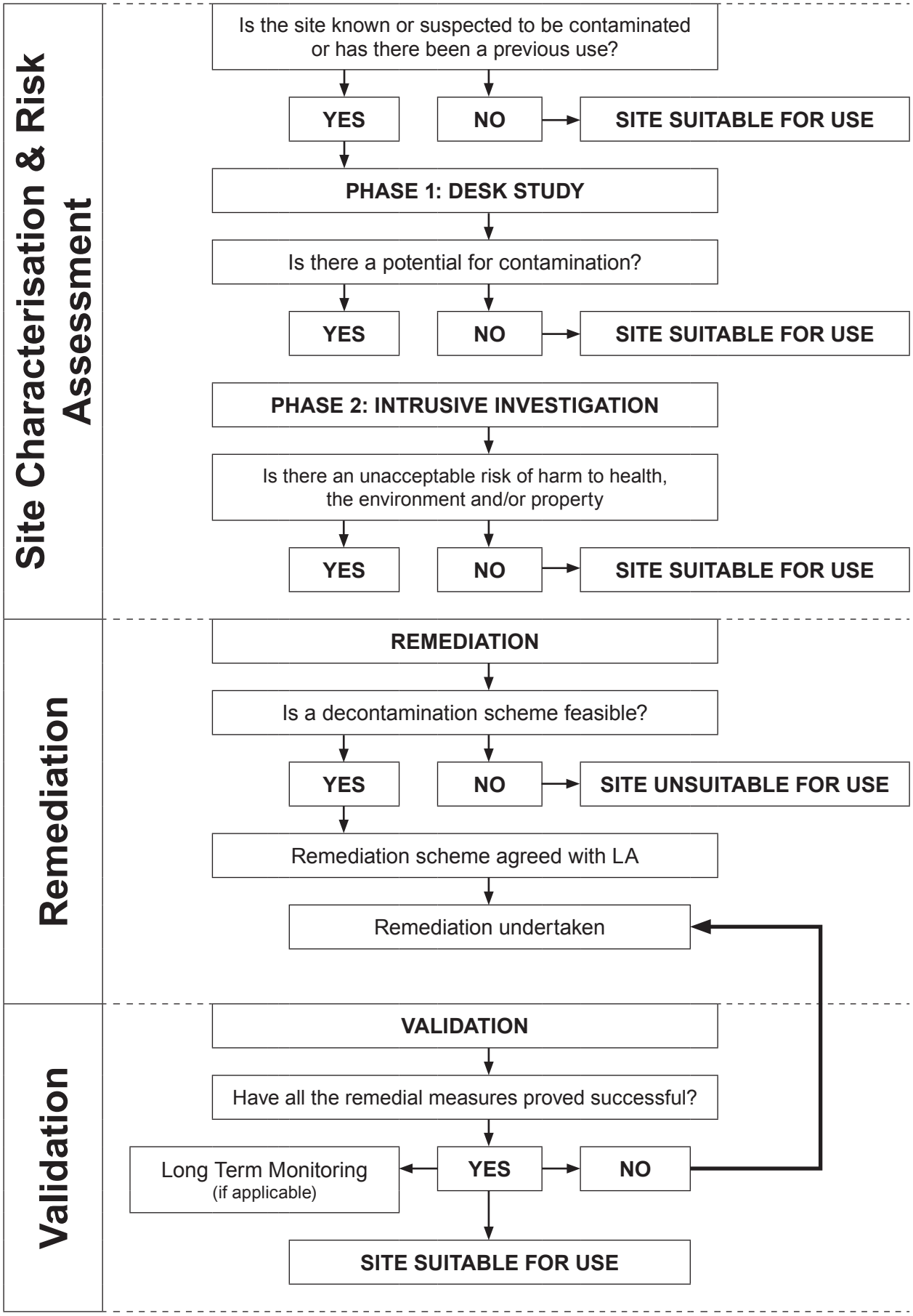
Ground Gas Handbook, CIEH - *To be published late 2007.*

Appendix 1. Guidance on the importation of soils

The following requirements will need to be met, in order to show that any soils brought on to the site are suitable for use and will not cause harm to human health, property, the environment or controlled waters:

- Details of the source and supplier of the soil(s) must be supplied to the Local authority;
- Soils must not be contaminated with materials such as plastics, metals, asbestos, glass, tarmac etc.;
- For soil from a single source, it will be necessary to take a **minimum of two random samples for every 15m^3**. For small quantities of soils, a minimum of **three samples** will be required in total. Where large quantities of soil from a single source are involved, it may be possible to reduce the frequency of sampling - however, this must have been previously agreed with the Local Authority;
- Analysis of these soil samples must take place in an **independent** accredited laboratories.
- The analytical suite must include a minimum of metals, speciated PAH, total TPH and pH. Analysis of additional substances may be required by the Local Authority: e.g. a pesticide suite for soils from agricultural sources;
- The results of the analysis must be compared with approved current guideline values. i.e. CLEA Soil Guideline Values, GACs, or other values that may have been previously agreed with the Local Authority; and
- The Local Authority must approve results of the analysis before the soils are placed on the site.

Appendix 2. Site Assessment Procedure Flow Chart



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Appendix 3. Validation Certificate to be completed by the applicant and developer

(separate certificate to be completed by each relevant party)
To the (Council address)

This is to Certify that the scheme of remediation*, decontamination and reclamation at the site known as:
.....

in relation to planning application number: .....

was carried out between the dates of: ..... and .....

and was completed in accordance with best practice and in accordance with the Council's document Land Affected by Contamination: Technical Guidance for Applicants and Developers and to the agreed specification detailed in the document:

.....

.....

Document Reference: ..... Date : .....

[**Together with the following amendments that have been submitted to and agreed in writing with the local planing authority:

.....

.....

Document Reference: ..... Date: .....]

which were designed to afford protection from contamination* on the site to all known receptors*.

Signed: ..... Dated: .....

Name: .....

Position: .....

Company Name and Address: .....

.....

*The words "contamination", "remediation" and "receptors" are defined by Part IIA of the Environmental Protection Act 1990.
**Complete/delete as applicable.

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Contact Information

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