LMB GEOSOLUTIONS LTD

PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

CASTLEWOOD HOUSE & MEDIUS HOUSE, LONDON WC1A

DOCUMENT RECORD

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Site	Castlewood House & Medius House, London WC1A
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	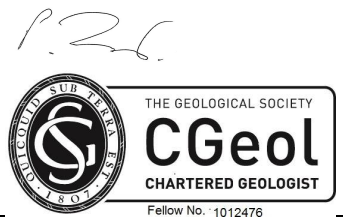

LMB Geosolutions Ltd

Company No. 8303397
www.lmbgeosolutions.com

Ground Investigation
Land Contamination
Hydrogeology
Engineering Geology

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EXECUTIVE SUMMARY

Executive Summary

Site Description		The site currently comprises Castlewood House (nine storey building with two storey basement) and Medius House (five storey building with single storey basement) that are separated by a five storey building. The ground floor and basement of Medius House is currently unoccupied and Castlewood House is utilised for office use.
Proposed Development		The proposed development includes comprise demolition of Castlewood House and partial demolition of Medius House with construction of an eleven storey office building with retail / restaurant use at ground level and enlargement of the existing double basement. At Medius House a two storey roof extension with private roof terraces will be constructed with a change of use from office to residential, but with retail use retained at ground floor level.
Summary of Previous Site Use & History		Historical mapping and information suggests that the site has primarily been used for commercial and residential purposes.
Geology & Aquifer Designations		Ground conditions comprise possible Made Ground overlying the Lynch Hill Gravel Member which in turn overlies the London Clay Formation and Lambeth Group. The Lynch Hill Gravel Member is designated a Secondary (A) Aquifer.
Hydrology		There are no known surface water features within 500m of the site. The site is located in an area at very low risk from flooding by rivers or sea. However, the site is located in an area at low to high risk of flooding from surface water and where there is potential for groundwater flooding.
Environmental Sensitivity		**Low/Moderate** environmental sensitivity.
Preliminary Risk Ratings	Land Contamination	Overall **Low** to **Low/Moderate.** Potential on-site and off-site sources of contamination have been identified associated with historical land uses. The low/moderate risks are associated with potential sources of ground gases / volatile vapours to posing an ongoing risk to future sites users and the built environment.
	Designation	The potential for the site to be designated as contaminated land (as defined in Part 2A of the Environmental Protection Act) is considered to be **Low**.
Recommendations		It is recommended that this report is submitted to London Borough of Camden to aid in discharge of Condition 14 of the planning permission.
This summary is not a stand-alone document and should be read in conjunction with the information contained within the report.		

INTRODUCTION

Introduction

AUTHORISATION

LMB Geosolutions Ltd (LMB) was instructed by COWI UK Ltd (Consultant Engineers) on behalf of Royal London Mutual Insurance Society (the Client) in June 2018 to complete a preliminary risk assessment in relation to the proposed development at Castlewood House & Medius House, 77-91 & 63-69 New Oxford Street, London WC1A 1DG (the Site).

PROJECT AND SITE DETAILS

Site Address	Castlewood House & Medius House, 77-91 & 63-69 New Oxford Street, London WC1A 1DG. A Site Location Plan is provided as **Figure 1**.
Site Area	Approximately 0.30 hectares.
Proposed Development	The development proposals comprise demolition of Castlewood House and partial demolition of Medius House with construction of an eleven storey office building with retail / restaurant use at ground level and enlargement of the existing double basement. At Medius House a two storey roof extension with private roof terraces will be constructed with a change of use from office to residential, but with retail use retained at ground floor level.
Development Planning	The planning permission for the development (ref. 2017/0618/P, April 2018) includes a number of conditions and Conditions 14 to 16 inclusive relate to potential land contamination issues.
Previous Reports	LMB has produced the following report in relation to the site and proposed development: • LMB (ref. LMB.18.05.14_REPPIL_SIS_v1.1, dated May 2018). Site Investigation Scheme. Castlewood House & Medius House, 77-91 & 63-69 New Oxford Street, London WC1A 1DG. The above document was produced to aid in discharge of Condition 14 of the planning permission.

BACKGROUND TO CURRENT WORKS

This assessment has been undertaken to support the proposed development and to identify any potential issues and constraints on the development associated with the ground conditions and possible land contamination.

AIMS & OBJECTIVES

This document aims to provide a preliminary environmental risk assessment to support discharge of Condition 14 of the planning permission.

INTRODUCTION

SCOPE OF WORKS

The Preliminary Environmental Risk Assessment (PRA) report includes the following scope of works:

- Completion of a site reconnaissance survey to make a preliminary assessment of the site and potential sources of contamination;
- Review of information within a Groundsure Enviro Insight report (ref. GS-5174748, June 2018) and review of information on the Local Authority website;
- Review of historical plans for the area to assess historical land uses on and immediately surrounding the site;
- Assessment of the 'sensitivity' of the site location as determined by factors such as hydrogeology, proximity of watercourses, neighbouring land use, ecologically sensitive uses and geology detailed on British Geological Survey (BGS) maps;
- Completion of an interpretive report that will include;
    - Details of site conditions;
    - Production of a preliminary conceptual site model;
    - Provision of a Preliminary Risk Assessment outlining potential issues and/or environmental liabilities associated with the proposed development; and
    - Conclusions, recommendations and provision of an executive summary.

LIMITATIONS

LMB has prepared this report solely for the use of the named Client and those parties with whom a warranty agreement and/or assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from LMB and the Client.

LMB accepts no responsibility or liability for:

a) the consequences of this document being used for any purpose or project other than for which it was commissioned, and

b) issue of this document to any third party with whom an agreement has not been executed.

The risk assessment and opinions provided, among other things, take in to consideration currently available guidance and best available techniques relating to acceptable contamination concentrations and interpretation of these values. No liability can be accepted for the retrospective effects of any future changes or amendments to these value.

Site Characterisation

DATA SOURCES

- British Geological Survey – 1:50,000 Geological Sheet 256, North London (Solid & Drift);
- British Geological Survey borehole archive records.
- Environment Agency Groundwater Vulnerability Mapping (1:100,000 series) Sheet 40, Thames;
- Information contained on the gov.uk website (https://flood-warning-information.service.gov.uk/long-term-flood-risk/map);
- NERC (2008). UK Hydrometric Register;
- River Basin Management Plan (RBMP). Thames River Basin District (2009);
- Barton, N.J. (1982). Lost Rivers of London.
- Groundsure Enviro Insight Report (ref. GS-5174748, June 2018).

SITE RECONNAISSANCE

A representative of LMB undertook a site reconnaissance survey on Tuesday 10th July 2018 during dry and overcast weather conditions.

A photographic recoded is provided as **Appendix A**.

Castlewood House currently comprises a T- shaped seven storey building with a two storey basement mainly beneath the 'L' part of the structure. The structure is bounded by a five storey building to the east (occupied by Tony & Guy), Earnshaw Street to the west side and by Bucknall Street to the south of the site. Castlewood House fronts onto New Oxford Street where pedestrian access is provided. Vehicle access is via a ramp off Bucknall Street that leads to a car park at basement level and under croft bicycle store (see Photo 1 and 2).

Castlewood House also includes an external courtyard area at basement level contained within a retaining wall that bounds Bucknall Street to the south and Earnshaw Street to the west (see Photo 3).

Medius House currently comprises a five storey superstructure with a single storey basement that is accessed from New Oxford Street (see Photo 4). The structure is bounded by Tony & Guy to the west, Tyott Street to the east and to the south there are warehouse and office buildings. The basement of Medius House is currently unoccupied (see Photo 5 and 6).

No potential sources of contamination such as bulk fuel storage containers, waste oils tanks etc were observed during the site reconnaissance. The building uses gas powered heating and a system of cold chillers to regulate building temperature (see Photo 7).

Domestic type waste is placed in waste bins stored at the top of the access ramp to the rear car park (see Photo 8).

SITE CHARACTERISATION

ENVIRONMENTAL SETTING

The sites environmental setting as defined by factors such as the local hydrology, geology and hydrogeology has been appraised through reference to publicly available information via the British Geological Survey (BGS), Environment Agency (EA) and UK Hydrometric Register and is summarised in the table below:

Published Geology & Aquifer Designations	Reference to published geological mapping (Sheet 256, North London) indicates that the site is located on the Lynch Hill Gravel Member (typically sands and gravels) which in turn overlie the London Clay Formation (typically silty clay) and Lambeth Group (typically clay, locally silty or sandy and sands and gravels). Information within the referenced data sources indicates that the following aquifer designations apply in the vicinity of the site: • Lynch Hill Gravel Member (Secondary A Aquifer); • London Clay Formation (Unproductive Strata); & • Lambeth Group (Secondary A Aquifer). The geological sequence progresses with depth into the Thanet Sands (Secondary A Aquifer) and Chalk (Principal Aquifer).
Local Hydrology	Reference to information on local mapping and within the referenced data sources indicates that there are no known surface water courses within 500m of the site. Reference to Barton, NJ (Lost Rivers of London) indicates that the site is not within 500m of the course of a former river or tributary. Information relating to the Thames region within the UK Hydrometric Register indicates that the average annual rainfall in the region is 710mm. Reference to information sources indicates that the site is located within an area with a very low risk of flooding from Rivers and the Sea. Information within the referenced data sources indicates that parts of the site are at low to high risk from surface water flooding. In addition, the site is located in an area where there is potential for groundwater flooding (related to the Lynch Hill Gravel Member). It should be noted that this factual information does not constitute an assessment of potential flood risk.
Resource Potential & Ecological Quality	**Surface Water**: N/A as outlined, there are no known surface water bodies within 500m of the site.
	Groundwater: The groundwater in the Lynch Hill Gravel Member is designated a Secondary (A) Aquifer and as such it is considered to be of importance on a local

	scale. However, the aquifer is not included within the relevant RBMP and its resource potential is considered to be limited. In addition, the Site is not located within an EA designated Source Protection Zone (SPZ). The nearest licensed groundwater abstraction is located approximately 470m north of the site and is for ground source heating and cooling. This abstraction is assumed to be from depth within the Principal Chalk Aquifer. The London Clay Formation is not considered to have a resource potential.
Surrounding Land Use	The site is located in an area of primarily residential and commercial land uses.
Local Designations	Information within the referenced indicates that there are no sensitive land uses (e.g. SSSI) within 500m of the site.

SUMMARY OF LIKELY GROUND & GROUNDWATER CONDITIONS

The information presented in the following sections is based on review of available BGS borehole logs for the local area (ref. TQ28SE1626, TQ28SE1627, TQ28SE1630 & TQ38SW189) and interpretation of BGS mapping.

The interpretation of this information should be considered preliminary pending completion of site specific ground investigation works.

Local Ground Conditions

The table below provides a summary of ground conditions based on the BGS logs reviewed.

Strata	Depth Range to Top (m bgl)	Depth Range to (Base (m bgl)	Summary Description
Made Ground	Ground level	<1.00 – 2.74	The logs reviewed suggest that the Made Ground soils comprise, 'Fill (brick, gravel and concrete rubble).'
Lynch Hill Gravel Member	<1.00 – 2.74	4.40 – 6.70	Dense to very dense brown sand and gravel.
London Clay Formation	4.40 – 6.70	24.70 – 25.50 (1)	The logs reviewed suggest that the London Clay typically comprises stiff becoming very stiff silty fissured clay with claystone.
Lambeth Group	24.70 – 25.50 (1)	Not determined in logs reviewed	Very stiff to hard fissured mottled grey brown and red clay.

(1) Only recorded in BGS borehole log TQ28SE1627 & TQ28SE1630.

SITE CHARACTERISATION

Further Information

Information provided by COWI UK indicates that an existing borehole record (BH715) recorded 7.0m of Made Ground which directly overlies the London Clay Formation with the Lynch Hill Gravel Member absent.

Local Groundwater Conditions

Groundwater strikes were recorded within BGS borehole logs (TQ28SE1626 and TQ28SE1627) reviewed at a depth of c. 4.10m bgl within the Lynch Hill Gravel Member.

Visual and Olfactory Observations

No visual or olfactory evidence of contamination was observed on the borehole records reviewed.

HISTORICAL LAND USE

A review of information within the groundsure report (ref. GS-5174748, June 2018) and historical map data has been completed to identify previous land uses on site and within a 300m radius of the site.

Selected historical maps are provided in **Appendix B**.

Map	On Site Features	Off Site Features
1875	Open land with seven large buildings fronting New Oxford Street. Bounded to west by Arthur Street and by residential properties to south and east.	Brewery approximately 50m north Church Lane approximately 15m south.
1895	Bounded by Carrier Street to the east.	Unspecified workhouse approximately 200m south east. Church Street now annotated as Bucknall Street.
1900	No noticeable change.	Central Line underground approximately 10m north.
1920		Hospital approximately 165m south east.
1948		Arthur Street now annotated as Earnshaw Street. Unspecified tank approximately 270m north west.
1952	Site of Castlewood House now occupied by Ministry of Supply Office and Medius House by buildings with same layout as current site.	Building bounding Castlewood House to the east annotated as Bank. Electricity sub-stations approximately 280m south east and 295m south.
1963	No noticeable change.	Garage approximately 130m east.

SITE CHARACTERISATION

Map	On Site Features	Off Site Features
1966		Hospital approximately 270m north west.
1982		Garage approximately 290m south.
1989		Electricity sub-station approximately 175m north.

LONDON BOROUGH OF CAMDEN (LBC)

LBC provide an online search facility for contaminated land information via their website. Unfortunately this facility is not currently functioning.

ENVIRONMENTAL & PERMITTING DATA

The table below provides a summary of the environmental and permitting data for the site and surrounding area:

Item	On Site	0 – 250m	Description
Part A (2) and Part B Activities	0	1	Dry cleaners approximately 240m south.
COMAH & NIHHS Sites	0	0	
Discharge Consents	0	0	
Pollution Incidents	0	1	This relates to a category 3 (minor) incident impacting land and air from smoke pollution approximately 130m west.
Current Industrial Data	0	42	These include ship brokers approximately 30m north, film distribution and haulage approxiamtely30m north, guitar repair and servicing approximately 80m south west, Tottenham Court LUL Station approximately 150m west and electrical equipment repair and servicing approximately 150m north west.
Local Authority Pollution Prevention Controls	0	0	
Registered Radioactive Substances	0	1	This relates to a revoked/cancelled register for St Pauls Hospital.
IPC & IPPC Authorisations	0	0	
Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	
Historical & Registered Landfills	0	0	

SITE CHARACTERISATION

Item	On Site	0 – 250m	Description
Licensed Waste Sites	0	1	This relates to a mobile plant license for soil treatment located approximately 190m north east

ENVIRONMENTAL SENSITIVITY

Overall, the site setting is considered to be of **low/moderate** environmental sensitivity, for the following reasons:

- The Site is located in a mixed residential and commercial land use area;
- The Site is underlain by the Lynch Hill Gravel Member which is designated a Secondary (A) Aquifer;
- The Site is not located within an SPZ and the closest licensed groundwater abstraction is located approximately 470m north of the site;
- The site is located in an area identified as being at very low risk of flooding from rivers and sea but is located in an area at medium to high risk from surface water flooding. In addition, the site is located in an area where there is potential for groundwater flooding (related to the Lynch Hill Gravel Member).
- The are no known surface water features within 500m of the site; and
- There are no recorded designated sensitive land uses within 500m of the site.

Preliminary Conceptual Site Model

The information presented in the Site Characterisation section of this report and within the following documents have been used to complete a Preliminary Conceptual Site Model (PCSM) that details the potential contaminant sources, pathways and receptors:

- Environment Agency/DEFRA document; Priority Contaminants for the Assessment of Land (CLR8)[1]
- Department of the Environment Industry Profile (1995). Railway land.

The PCSM is presented in the table below:

Potential Contaminant Sources	On-site	• Possible Made Ground associated with former building demolition and construction.
	Off-site	• London Underground line within 20m. • Former brewery within 50m. • Former garage within 150m. • Electricity sub-stations within 200m. • Historical unspecified tank within 300m.
Associated Contaminant	On-site	• Heavy metals and inorganic contaminants including Asbestos Containing Materials (ACM). • Organic contaminants. • Possible generation of bulk ground gases & volatile vapours.
	Off-site	• Heavy metals and inorganic contaminants including Asbestos Containing Materials (ACM). • Organic contaminants including hydrocarbons (diesel, petroleum, PAHs, solvents, bitumen) and phenols. • Possible generation of bulk ground gases & volatile vapours.
Receptors		• Future Site Users; • Neighbouring residents / site users; • New Building;
Pathways to Receptors		• Direct contact, inhalation and ingestion of contaminants within below ground soils. • Migration of ground gas and volatile vapours via Made Ground / natural soils on to site.

[1] This document has been withdrawn but is considered to remain useful in proving technical background for identifying potential sources of contamination and designing ground investigation works.

Preliminary Risk Assessment

INTRODUCTION

This section provides a Preliminary Risk Assessment (PRA) that considers the information provided in the previous sections, including the PCSM.

The PRA and risks ratings assigned in the tables below are based on the qualitative risk assessment matrices presented in CIRIA C552 which are reproduced in **Appendix C**.

POLLUTANT LINKAGE ASSESSMENT

The likelihood of pollutant linkages being present between the potential contaminant sources, pathways and receptors identified in the PCSM are outlined in the table below:

Pathway Linkage	Likelihood of Pollutant Linkage	Consequences	Risk Rating	Reasoning
Future Site Users (Direct exposure pathway)				
Ingestion/Dermal Contact/Inhalation (Site Users).	Unlikely	Medium	Low	It is proposed to develop the site for retail/commercial use at basement / ground floor level with some above ground residential use. Ground surfacing currently and post development will comprise hardstanding, which would sever any direct contact pathways. There may be limited areas of landscaping but these are likely to be raised and/or comprise clean imported materials. Maintenance and construction workers will adopt appropriate management procedures to mitigate potential risks.
Ingestion/Dermal Contact/Inhalation (Maintenance and Construction Workers).	Unlikely	Medium	Low	
Future Site Users (Indirect exposure pathway)				
Enclosed space accumulation of ground gas.	Low	Severe	Low/Moderate	Potential on-site and off-site sources of ground gas and volatile vapours have been

Pathway Linkage	Likelihood of Pollutant Linkage	Consequences	Risk Rating	Reasoning
				identified associated with previous land uses. However, the site and surrounding area has been redeveloped and now primarily comprises hard surfacing and potential sources are separated from the site by buildings and below ground features such as existing basements and utility infrastructure. As such there is limited potential for ground gas / volatile vapour migration on to site. In addition, the basement areas of the development are likely to include mechanical ventilation.
Outdoor volatile vapour exposure	Unlikely	Medium	Low	Outdoor exposure is very unlikely given the proposed end use.
Ingress into potable water supply pipes	Low	Mild	Low	It is considered unlikely that upgraded water pipe material will be required. However, confirmation with the statutory undertaker is recommended.
Risks to Buildings via accumulation of ground gas and volatile vapours in enclosed spaces and sub-floor voids.	Low	Severe	Low/Moderate	Potential on-site and off-site sources of ground gas and volatile vapours have been identified associated with previous land uses. However, the site and surrounding area has been redeveloped and now primarily comprises hard surfacing and potential sources are separated from the site by buildings and below ground features such as existing basements and utility infrastructure. As such there is limited potential for ground gas

Pathway Linkage	Likelihood of Pollutant Linkage	Consequences	Risk Rating	Reasoning
				/ volatile vapour migration on to site. In addition, the basement areas of the development are likely to include mechanical ventilation.
Water Environment				
Contaminant migration on to neighbouring land.	Unlikely	Medium	Low	The site and surrounding area have been redeveloped and it is considered unlikely that sources of contamination are present beneath the site at concentrations that are likely to impact neighbouring land.
Contaminant migration from neighbouring land.	Unlikely	Medium	Low	
Contamination of groundwater	Unlikely	Medium	Low	
Contamination of surface water	Unlikely	Medium	Low	It is possible that during any construction phase there could be some limited run-off from stockpiles/earthworks. However, it is considered unlikely that such run-off would be contaminated and control measures would be adopted.
Overall Risk Rating			**Low to Low/Moderate**	

DESIGNATION AS CONTAMINATED LAND

Based on the results of the PRA, the potential for the site to be designated as contaminated land (as defined in Part 2A of the Environmental Protection Act) is considered to be **Low**. However, this is on the assumption that any planning conditions related to potential land contamination issues are dealt with to the satisfaction of LBC as part of the development.

Conclusions & Recommendations

CONCLUSIONS

Environmental Se ng

The ground conditions beneath the site comprise Made Ground overlying the Lynch Hill Gravel Member which in turn overlie the London Clay Formation and Lambeth Group.

The Lynch Hill Gravel Member is designated a Secondary (A) Aquifer and review of local archive borehole logs suggests that groundwater was recorded within this stratum.

The site is located within an area at very low risk of flooding from rivers and sea but is located in an area at low to high risk from surface water flooding. In addition, the site is located in an area where there is potential for groundwater flooding.

Reference to historical mapping indicates that the site and surrounding area has primarily been used for residential and commercial railway land use.

Overall, the site setting is considered to be of **low/moderate** environmental sensitivity.

Current & Proposed Site Use

The site currently comprises Castlewood House (nine storey building with two storey basement) and Medius House (five storey building with single storey basement) that are separated by a five storey building. The ground floor and basement of Medius House is currently unoccupied and Castlewood House is utilised for office use.

The development proposals comprise demolition of Castlewood House and partial demolition of Medius House with construction of an eleven storey office building with retail / restaurant use at ground level and enlargement of the existing double basement. At Medius House a two storey roof extension with private roof terraces will be constructed with a change of use from office to residential, but with retail use retained at ground floor level.

Preliminary Risk Assessment

Based on the information reviewed there are potential on-site and off-site sources of contamination relating to historical land uses (e.g. Made Ground associated with building demolition/construction, former brewery and garage).

The ground surfacing currently and post development will primarily comprise hardstanding, which would sever any direct contact pathways. There may be limited areas of landscaping but these are likely to be raised and/or comprise clean imported materials.

CONCLUSIONS & RECOMMENDATIONS

There is potential for sources of ground gases / volatile vapours to pose an ongoing risk to future sites users and the built environment. However, the site and surrounding area has been redeveloped and now primarily comprises hard surfacing and potential sources are separated from the site by buildings and below ground features such as existing basements and utility infrastructure which would limit potential risks. In addition, the basement areas of the development will include mechanical ventilation.

It is considered unlikely that any existing contaminants beneath the site could impact groundwater, third party land or vice versa.

Based on the preliminary risk assessment completed the overall risks are considered to be **Low** to **Low/Moderate**.

The potential **Low/Moderate** risks that have been identified are associated with bulk ground gases and volatile vapours from historical sources.

Designation as Contaminated Land

On the assumption that potential land contamination issues are dealt with as part of the development, the potential for the site to be designated as contaminated land (as defined in Part 2A of the Environmental Protection Act) is considered to be **Low**.

RECOMMENDATIONS

As outlined this report has been completed to aid in discharge of Condition 14 of the planning permission which also requires site investigation works to be undertaken.

In accordance with Condition 14 of the planning permission a Site Investigation Scheme (ref. ref. LMB.18.05.14_REPPIL_SIS_v1.1, dated May 2018) has been submitted to LBC and site investigation works have completed in accordance with the SIS and will be reported under separate cover.

It is recommended that this report is submitted to LBC to aid in discharge of Condition 14 of the planning permission.

REFERENCES & GUIDANCE

1. London Boroughs Publication (undated). A Guide to help developers meet planning requirements.
2. Environment Agency/Defra (2002). Model procedures for the Management of Land Contamination (CLR 11)
3. Environment Agency/Defra (2002). Contaminated Land Statutory Guidance (April 2012)
4. BS 10175 (2011) Investigation of Potentially Contaminated Sites. Code of Practice.
5. BS5930 (2007) Code of Practice for Site Investigations.
6. BS 5667-11:2009. Water quality sampling. Part 11: Guidance on sampling of groundwaters.
7. Department of the Environment Industry Profiles.
8. Environment Agency/Defra (2002). Sampling strategies for contaminated land (CLR4)2
9. Environment Agency/Defra (2002). Priority Contaminants for the Assessment of Land (CLR8)3
10. CIRIA (2007). Assessing risks posed by hazardous ground gases to buildings
11. BS 8485:2015. Code of Practice for the Design of protective measures for methane and carbon dioxide ground gases for new buildings.
12. NHBC (2007). Guidance on the Evaluation of Development proposals on sites where Methane and Carbon dioxide are present.
13. Landfill Gas Industry Code of Practice (Todeka Ltd, 2012). The Management of Landfill Gas;
14. CL:AIRE / CIEH (2008), Guidance on Comparing Soil Contamination Data with a Critical Concentration, May 2008;
15. CL:AIRE / EIC (2009), The Soil Generic Assessment Criteria for Human Health, December 2009.
16. Environment Agency (2003), Review of fate & transport of selected contaminants in the Environment, Report P5-079-TR1;
17. Environment Agency (2004), Model Procedures for the Management of Land Contamination, September 2004, ISBN: 1844322955;
18. Environment Agency (2008a), Compilation of Data for Priority Organic Pollutants, Report SC050021/SR7, November 2008;
19. Environment Agency (2009a), Human Health Toxicological Assessment of Contaminants in Soil, Report SC050021/SR2, January 2009;
20. Environment Agency (2009b), CLEA Software (Version 1.04) Handbook (and Software), Report SC050021/SR4, January 2009;
21. Environment Agency (2009c), Updated Technical Background to the CLEA Model, Report SC050021/SR3, January 2009;
22. Environment Agency (2009d), A Review of Body Weight and Height Data Used in the CLEA Model, Report SC050021/Final Technical Review 1, January 2009;

[2] This document has been withdrawn but is considered to remain useful in proving technical background for designing ground investigation works.

[3] This document has been withdrawn but is considered to remain useful in proving technical background for designing ground investigation works.

REFERENCES & GUIDANCE

23. Nathanial et. al., (2009), The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment (2nd edition), Land Quality Press, Nottingham, ISBN 0-9547474-7-X
24. USEPA (2004), User's Guide for Evaluating Subsurface Vapour Intrusion into Buildings
25. Environment Agency (2012). Groundwater Protection: Principles and Practice (GP3)
26. Water Framework Directive (2000/60/EC)
27. Groundwater Regulations (2009).
28. Drinking Water Quality Standards England & Wales 2000 (Amended 2004, DWS).
29. World Health Organisation (WHO) Petroleum Products in Drinking Water.
30. Environmental Quality Standards (EQS). The River Basin Districts Typology, Standards and Groundwater Threshold Values (Water Framework Directive) (England and Wales) Directions 2010.
31. Environment Agency (2006). Remedial Targets Methodology. Hydrogeological Risk Assessment for Land Contamination.
32. Environment Agency (2013, 3rd edition). Technical Guidance WM2. Hazardous Waste: Interpretation of the definition and classification of hazardous waste.
33. DEFRA (2012). Guidance on the legal definition of waste and its application.

FIGURES

Key:

Approximate site location

IMPORTANT – Please Read

This drawing is for illustrative purposes only and is for use only in conjunction with associated reports relating to the project details below. LMB accepts no liability for the mis-interpretation or use of this illustration by any other parties.

LMB

Ground Investigation
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Site: Castlewood & Medius House, London

Figure Number: Figure 1

Title: Site Location Plan

Project No:	Created By:	Date:
	PIL	May 2018

Client: RLAM Ltd

APPENDICES

Appendices

APPENDIX A PHOTOGRAPHIC RECORD

Plate 1: Entrance to Castlewood House from Bucknall Street.

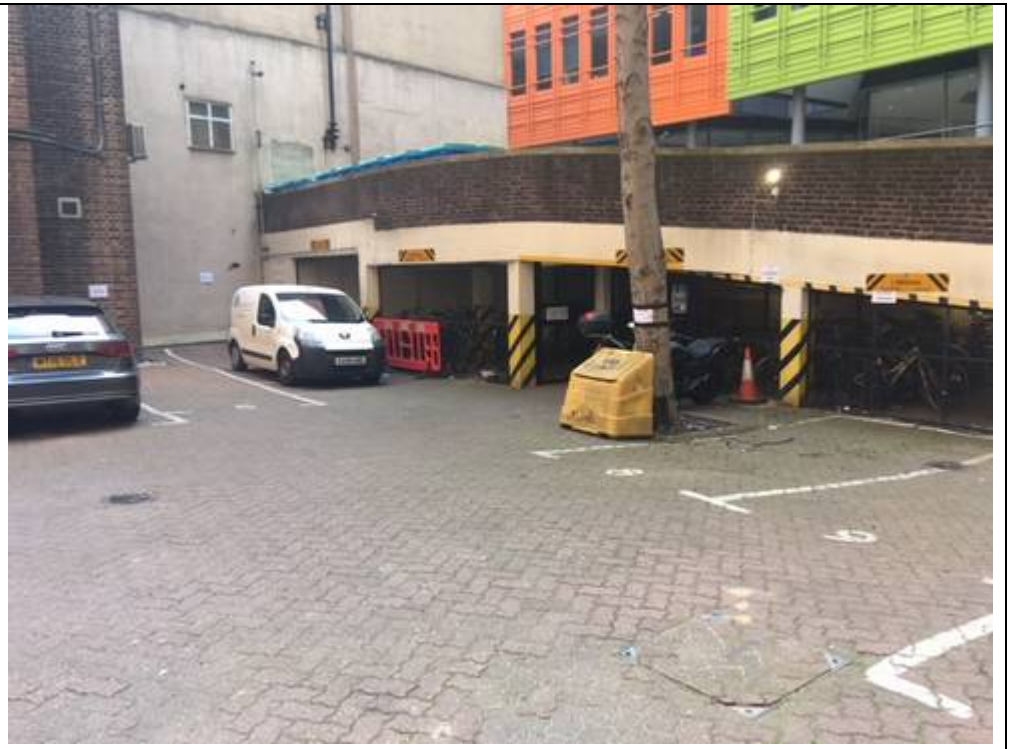


Plate 2: Castlewood House carpark with under croft bike store in background.

Plate 3: Courtyard area, Castlewood House.

Plate 4: Medius House frontage from New Oxford St.

Plate 5: Basement lightwell, Medius House.

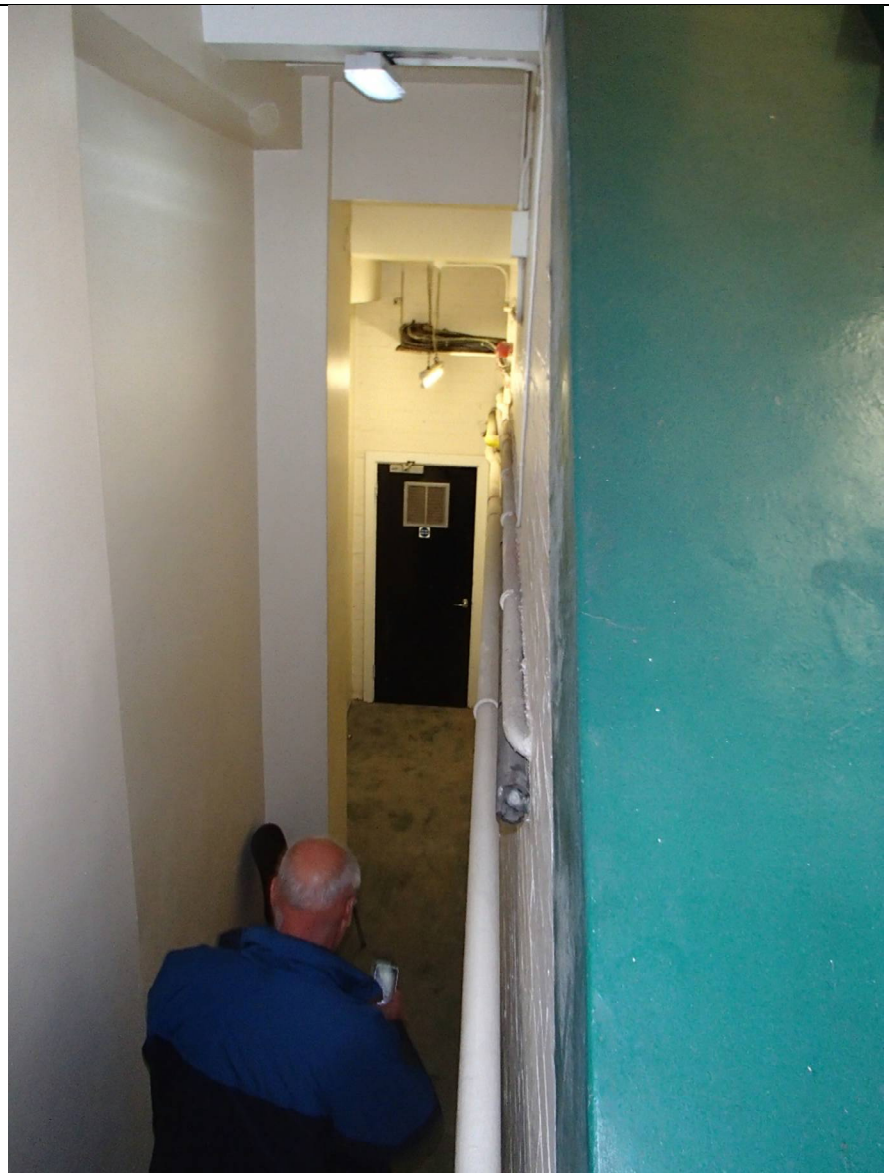


Plate 6: Fire escape from Medius House.

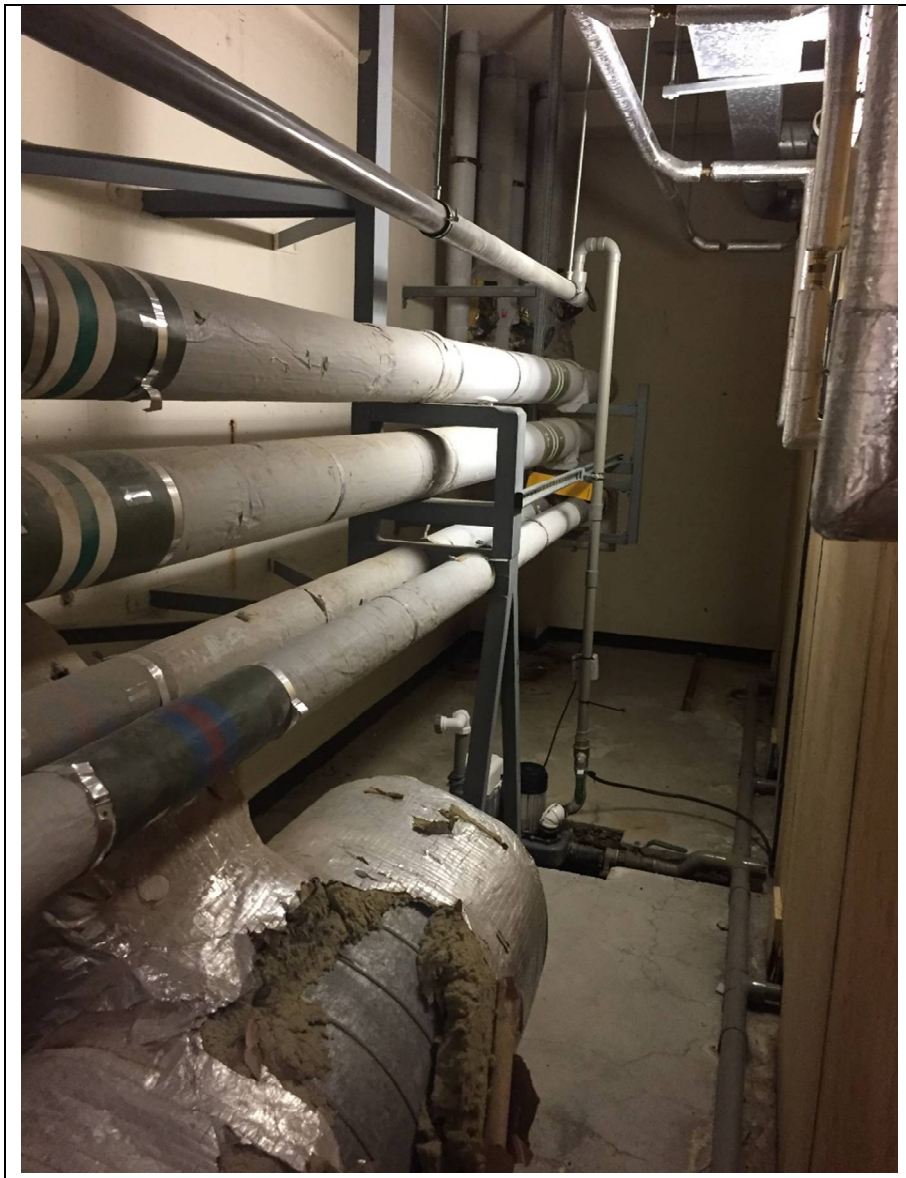
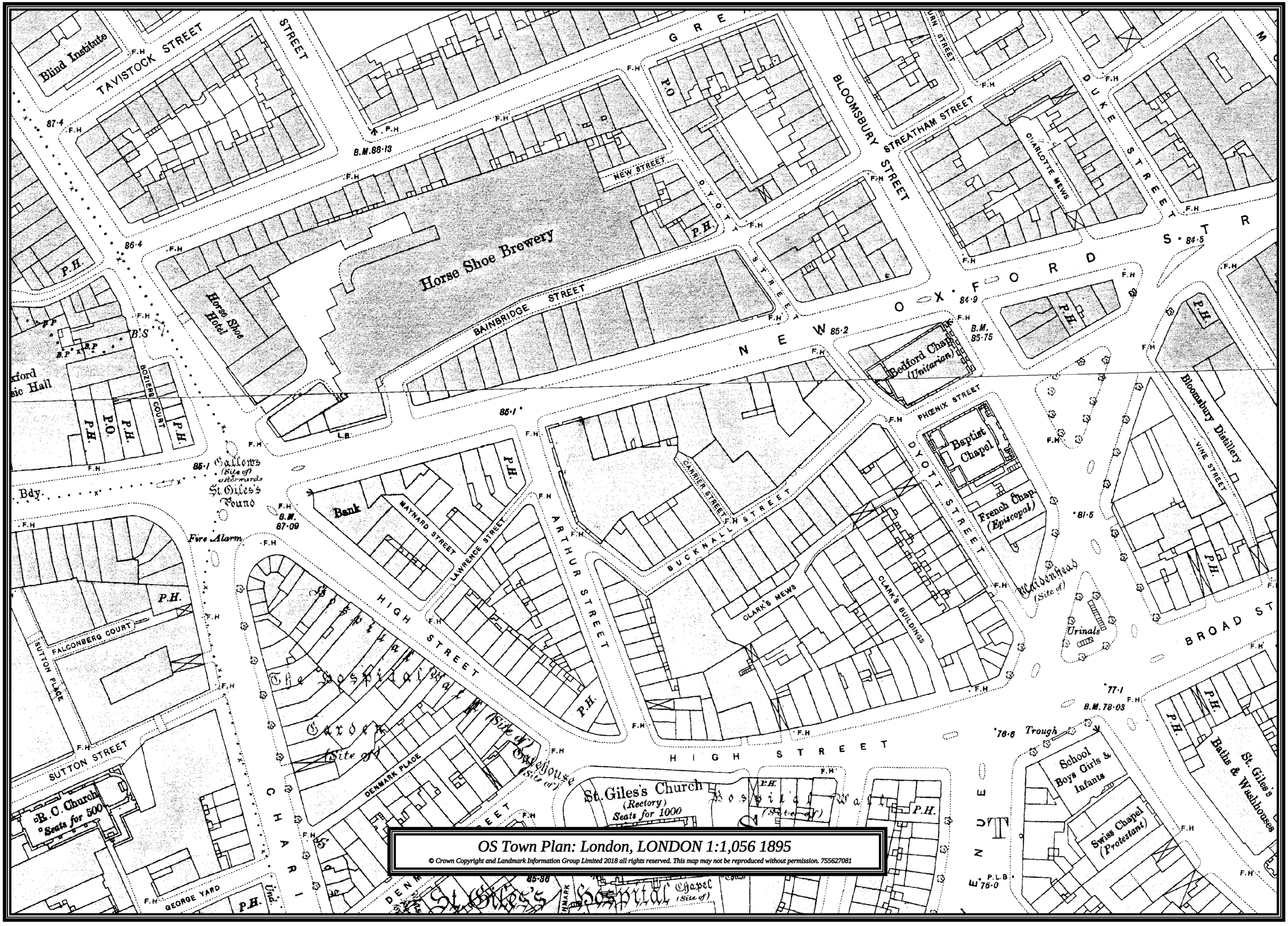


Plate 7: Internal service corridor, Castlewood House.

Plate 8: Waste disposal bins, Castlewood House.

APPENDICES

APPENDIX B SELECTED HISTORICAL PLANS



OS Town Plan: London, LONDON 1:1,056 1895

OS Plan 1:1,250 1952-1953

APPENDICES

APPENDIX C

Risk Classification Matrix (C552 CIRIA, 2001)

Classification of consequence

Classification	Definition
Severe	Short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short term risk of pollution (note; Water Resources Act contains no scope for considering significant pollution) of sensitive water resource. Catastrophic damage to building/property. A short term risk to a particular ecosystem, or organism forming part of such ecosystem. (Note the definitions of ecological systems within the Draft Circular on Contaminated Land DETR, 2000).
Medium	Chronic damage to human health ('significant harm', as defined In DETR, 2000). Pollution of sensitive water resources (note; Water Resources Act contains no scope for considering significant pollution). A significant change in a particular ecosystem, or an organism forming part of such an ecosystem. (Note the definitions of ecological systems within the Draft Circular on Contaminated Land DETR, 2000).
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm', as defined In DETR, 2000). Damage to sensitive buildings/structures/services or the environment.
Minor	Harm, although not necessarily significant harm, which may results in a financial loss, or expenditure to resolve. Non-permanent heath effects to human health (easily prevented by means such as persona protective clothing etc). Easily repairable effects of damage to buildings, structures and services.

Classification of probability

Classification	Definition
High likelihood	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the ling term, or there is evidence at the receptor of harm or pollution.
Likely	There is a pollutant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period that such an event would take place, and is even less likely in the sorter term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

APPENDICES

Classification of probability

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate/Low Risk
	Likely	High Risk	Moderate Risk	Moderate/Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate/Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate/Low Risk	Low Risk	Very Low Risk	Very Low Risk