Loxley Homes

Desk Study Report

For

Land off Dinting Road, Glossop

August 2012

DOCUMENT ISSUE RECORD

Contract No: 12CHE057/DS

Client: Loxley Homes

Contract: Land off Dinting Road, Glossop

Document: Desk Study Report

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Approved by:	M Fawcett
Date:	August 2012

REVISION RECORD

Revision	Date	Description	Prepared by
0	August 2012	Draft for issue and comments	BB

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GEO ENVIRONMENTAL

CONTENTS

1 EXECUTIVE SUMMARY

	Action
Site Location: The site is off Shaw Lane or Dinting Road, Glossop, Derbyshire (approximate site centre coordinates, 401960, 395010). Site area is approximately 5.21 hectares.	
Site Description: **On Site:** Site was visited by an engineer on 20th July 2012; the site is accessed either via Shaw Lane to the north of site or via Dinting Road to the south of site. The site is currently open grass land, there is a public right of way which bisects the site north to south from Shaw Farm immediately beyond the northern boundary of the site to Dinting Road to the south. There is a stream located to the north of site running east to west. The site slopes gently north to south, there is an embankment immediately beyond the eastern site boundary associated with the railway track located beyond the embankment. The railway itself lies within a cutting below the subject site level. **Surrounding Area**: Surrounding land uses are as follows: Southeast- car park for the nearby train station- topographically lower than the subject site East- embankment followed by railway line (within a cutting) North- Residential housing- topographically level or topographically higher than the subject site South and West- Dinting Lodge industrial estate- topographically lower than the subject site	
Proposed Development: The proposed development comprises the construction of residential properties with associates rear gardens and car park hard standing. A proposed site layout was not available at the time of issue.	
Site History: **On site:** The site is shown as undeveloped on all maps. A pond is shown in the centre of site from the map of 1898 to 1921 associated with the stream on site. It is unknown whether this pond was infilled, or whether the pond naturally silted up. The location of the stream on site appears to have been altered circa 1921 and also in 1989. **Surrounding Area**: Notable land uses in the surrounding area include: ➢ Railway east of site ➢ Reservoirs 110m SW and 250m SE (reservoir 110 SW now an industrial estate) ➢ Printworks 350m southwest of site until 1969 ➢ Mouselow Quarry 180m northeast	
Summary of Environmental Data: Low contamination/ground gas risk associated with a former landfill and pond on site, ground investigation is required to confirm and benchmark levels.	Potential contamination risk
Published Geology: The BGS map shows the geology beneath the site to be sequence of Glacial Till overlying Millstone Grit Group	
Hydrogeology and Hydrology: ➢ The drift deposits are classed as a unproductive Aquifer (negligible permeability) and the bedrock deposits are classed as a Secondary Aquifer (moderate permeability) ➢ The site does not lie within a groundwater source protection zone as outlined by the Environment Agency ➢ The nearest surface water feature is the stream on site ➢ The site is not within an area outlined as at low risk from flooding by the Environment Agency ➢ There are 2 water abstractions <500m from site	

Radon Protection: The property is not in a radon affected area with less than 1% of properties above the action level. Therefore no Radon protection measures are necessary	
Qualitative Risk Assessment: The site poses a potential Low-Low/Moderate risk; therefore a ground investigation is required	*Ground investigation required*
Geotechnical Risk: ➢ Existing trees may influence foundations should clay strata be encountered on site ➢ Localised deepening of foundations may be required in the vicinity of the former landfill area and pond depending on the extent of made ground in this locality.	

2 SITE DESCRIPTION

2.1 Introduction

This investigation was carried out on the instruction of Loxley Homes. The purpose of the work was to carry out a desk study provide contamination risk information for the proposed construction of residential properties with associates rear gardens and car park hard standing. A proposed site layout was not available at the time of issue.

2.2 Site Location

The site is off Shaw Lane or Dinting Road, Glossop, Derbyshire (approximate site centre coordinates 401960, 395010). Site area is approximately 5.21 hectares. See Site Location Plan in Appendix A.

2.3 Site Description

2.3.1 On Site

Site was visited by an engineer on 20th July 2012; the site is accessed either via Shaw Lane to the north of site or via Dinting Road to the south of site.

The site is currently open grass land, there is a public right of way which bisects the site north to south from Shaw Farm immediately beyond the northern boundary of the site to Dinting Road to the south.

There is a stream located to the north of site running east to west.

The site slopes gently north to south, there is an embankment immediately beyond the eastern site boundary associated with the railway track located beyond the embankment. The railway itself lies within a cutting below the subject site level.

2.3.2 Surrounding Area

Surrounding land uses are as follows:

- Southeast- car park for the nearby train station- topographically lower than the subject site
- East- embankment followed by railway line (within a cutting)
- North- Residential housing- topographically level or topographically higher than the subject site
- South and West- Dinting Lodge industrial estate- topographically lower than the subject site

3 SITE HISTORY

3.1 Site History from Ordnance Survey Maps

A search of available historic maps was undertaken to establish the land use history of the site. Extracts of the maps discussed below can be found in Appendix B of this report. All maps are Ordinance Survey unless otherwise stated. All distances quoted on OS maps are taken from the site boundary, which is marked on the map.

3.2 Summary of Site History

3.2.1 On site

The site is shown as undeveloped on all maps.

A pond is shown in the centre of site from the map of 1898 to 1921 associated with the stream on site. It is unknown whether this pond was infilled, or whether the pond naturally silted up.

The location of the stream on site appears to have been altered circa 1921 and also in 1989.

3.2.2 Surrounding Area

Notable land uses of significance over the course of the maps in the surrounding area are as follows:

Date	Area
1882	Houses shown immediately northwest of site Railway shown within a cutting immediately east of site Pond shown 10m south (and all subsequent maps) Reservoirs located 110m SW and 250m SE of site Dinting Vale Printworks 350m southwest of site Gravel pit 80m northwest of site Mouselow Quarry (stone) shown 180m northeast of site.
1887	Various notes on the map detailing ventilators circa 220m south of site- these notes are linear in form south and southeast of the site going towards mills 600m southeast. The vents are shown to the map of 1969. This could be associated with a culverted watercourse associated with the reservoirs and the mills located 600m southeast of site however this is has not been confirmed. Given the age, extent and location, the ventilators are unlikely to be associated with coal mining (no adits or shafts in the area), or landfill (linear layout, and age).
1954	Mouselow Quarry expanded- now a brick works
1969	Ventilators no longer shown on the maps
1974	Dinting Lodge is now an industrial estate Dinting Printworks is now a series of smaller businesses (Printing works closed in 1966) Reservoirs 110 SW and 250 SE are shown as disused
1981	Mouselow Quarry no longer labelled as a brickworks but still functioning as a Quarry
1991	Reservoir 110m SW no longer shown on plan- Dinting Lodge industrial estate now extended over the former reservoir area.

4 ENVIRONMENTAL DATA

The following section details both geological and environmental data available for the site and the surrounding area. Full details can be found in the Envirocheck Report by Landmark located in Appendix C.

4.1 Geology

The documented geology of the site is summarised on British Geological Survey map principally:

Geology	Drift	Solid
Sheet 086 (1:50000)	Glacial Till (silty sandy clay)	Millstone Grit Group (mudstone, siltstone, sandstone)

4.2 Mining, extraction and natural cavities

Although the historic maps and data shown no adits or mineshafts in the locality, the site lies within an area required a Coal Authority Report, as such a report was obtained and is summarised below. A full copy can be found within Appendix C of this report.

Past- *According to the records in our possession, the property is not within the zone of likely physical influence on the surface from past underground workings.*
Present- *The property is not in the likely zone of influence of any present underground coal workings.*
Future-*The property is not in an area for which the Coal Authority is determining whether to grant a licence to remove coal using underground methods.*
The property is not in an area for which a licence has been granted to remove or otherwise work coal using underground methods.
The property is not in an area that is likely to be affected at the surface from any planned future workings.
However, reserves of coal exist in the local area which could be worked at some time in the future.
No notice of the risk of the land being affected by subsidence has been given under section 46 of the Coal Mining Subsidence Act 1991.

4.3 Environmental Permits, Incidents and Registers

There is 1 current discharge condition associated with the Quarry east of site as shown below

1	**Discharge Consents** Operator: Wienerberger Ltd Property Type: Sewage Disposal Works - Other Location: Chelwood Brick Septic Tank, Shaw Lane, Glossop, Derbyshire Authority: Environment Agency, North West Region Catchment Area: Not Given Reference: 016993245 Permit Version: 1 Effective Date: 16th January 1998 Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Trib Glossop Brook **Status: Post National Rivers Authority Legislation where issue date > 31/08/1989** Positional Accuracy: Located by supplier to within 100m	A13NE (E)	32

There are 2 pollution incidents to controlled waters noted within 250m of the site, both incidents refer to areas either part of another water system than the stream on site, or are downstream from the site.

Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site
Pollution Incidents to Controlled Waters Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Oils - Unknown Note: Pond/Tributary Glossop Incident Date: 13th August 1993 Incident Reference: 93641602 Catchment Area: Etherow Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A13SW (SW)	82
Pollution Incidents to Controlled Waters Property Type: Road (Road Traffic Accident) Location: Sandwell Valley Authority: Environment Agency, Midlands Region Pollutant: Oils - Diesel (Including Agricultural) Note: Tame; Diesel In River Incident Date: 3rd March 1999 Incident Reference: 2705487 Catchment Area: Trent Catchment : Upper Tame To Confluence With Rea Receiving Water: Watercourse Cause of Incident: Other Incident/Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A13SE (E)	182

4.4 Landfill and Other Waste Sites

There are 2 known landfill sites <250m from site as shown below:

Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
Registered Landfill Sites Licence Holder: Wildedge Properties Ltd Licence Reference: LG10 Site Location: Adj. Shaw Lane, Glossop, Derbyshire Licence Easting: 402030 Licence Northing: 395100 Operator Location: High Lodge, Whirley Ln. Henbury, Macclesfield, Cheshire Authority: Environment Agency - North West Region, South Area Site Category: Landfill Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st January 1980 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste Construction And Demolition Wastes Prohibited Waste Poisonous, Noxious, Polluting Wastes	A13NE (NE)	0	1	402030 395100

The landfill on site may be associated with the change in location of the stream on site which was circa 1980-1986. The license details suggest that landfilled materials were inert demolition and construction wastes.

Historical Landfill Sites Licence Holder: E R Carpenter Plc Location: Dinting Lodge Name: Dinting Lodge Industrial Estate Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD22660 First Input Date: 31st December 1992 Last Input Date: 31st March 1993 Specified Waste Type: Deposited Waste included Inert and Industrial Waste EA Waste Ref: Not Supplied Regis Ref: Not Supplied WRC Ref: 1000/0171 BGS Ref: Not Supplied Other Ref: LG24	A13SW (SW)	28	1	401871 394908

This license corresponds with the construction of Dinting Lodge Industrial estate immediately east of the landfill, the landfill is likely to be associated with eartchworks during the build, however this is unknown.

4.5 Hydrogeology and Hydrology

- The drift deposits are classed as a unproductive Aquifer (negligible permeability) and the bedrock deposits are classed as a Secondary Aquifer (moderate permeability)
- The site does not lie within a groundwater source protection zone as outlined by the Environment Agency
- The nearest surface water feature is the stream on site
- The site is not within an area outlined as at low risk from flooding by the Environment Agency
- There are 2 water abstractions <500m from site as shown below:

Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
Water Abstractions Operator: Chartdell Utilities Ltd Licence Number: 2569010030 Permit Version: 100 Location: Glossop Brk And Gamesley Brk At Glossop Authority: Environment Agency, North West Region Abstraction: Other Industrial/Commercial/Public Services: Boiler Feed Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): 32 Yearly Rate (m3): 9092 Details: Dinting Vale Print Works Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 18th October 1991 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A8NE (S)	441	1	402100 394400
Water Abstractions Operator: Chartdell Utilities Ltd Licence Number: 2569010030 Permit Version: 100 Location: Glossop Brk And Gamesley Brk At Glossop Authority: Environment Agency, North West Region Abstraction: Other Industrial/Commercial/Public Services: Process Water Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Dinting Vale Print Works Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 18th October 1991 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A8NE (S)	441	1	402100 394400

4.6 Radon

The property is not in a radon affected area with less than 1% of properties above the Action level; no Radon protection measures are necessary.

5 SUMMARY OF ENVIRONMENTAL SENSITIVITY

The following section is a review of the environmentally sensitivity of the site as discussed in Sections 2-4. Significant potential risks are discussed in the following subsections and will then be evaluated as part of the Site Conceptual Model in Section 5.

Sources are defined as where pollution comes from, pathways are a route in which the pollution travels and receptors are anything affected by a pollutant. Further details on Source-Pathway-Receptor methodology can be found in Appendix D.

The table below focuses on significant site specific sources, pathways and receptors. More 'generic' pathways and receptors (such as site end uses) will be covered as part of the full Site Conceptual Model in Section 5.

5.1.1 Sources

Source	Distance/ Direction	Details	Significant Risk
Existing land use	On site	The site is currently, and is shown on all maps as an open field. No visual or olfactory evidence of contamination on site No significant contamination risk associated with current land use	**No**
Landfill	On site	The former landfill on site is likely to be associated with the change in location of the stream on site which was circa 1980-1986. The license details suggest that landfilled materials were inert demolition and construction wastes. Therefore the risk from ground gas is lowered from this source. Ground investigation is required to confirm the nature (and if possible the extent) of the landfill	**Unlikely- Ground Investigation required to confirm**
Former Pond	On site	Potentially infilled pond circa 1921, though it is unknown whether this pond was infilled or has naturally silted up. Given the age of potential backfill, the risk of material still gassing is lowered, ground investigation in this vicinity is required	**Unlikely- Ground Investigation required to confirm**
Railway line	10m east	The railway line is located within a cutting off site, given anticipated nature of the material encountered on site, the likelihood of contamination migration from this source is reduced	**Low**
Landfill associated with Dinting Lodge/ Infilled reservoir	50m south	The landfill and infilled reservoir located 50m south of site are at a lower elevation to the subject site. Given the cohesive nature and that the source is down gradient of the site, the likelihood of contamination gas migration from this source is deemed low.	**Low**
Printing works/ existing industrial estate	50-350m south	The industrial land use located 50m south of site are at a lower elevation to the subject site. Given the cohesive nature and that the source is down gradient of the site, the likelihood of contamination migration from this source is deemed low.	**Low**

6 INITIAL CONTAMINATION CONCEPTUAL MODEL

For details on how the conceptual model is evaluated please refer to Appendix D

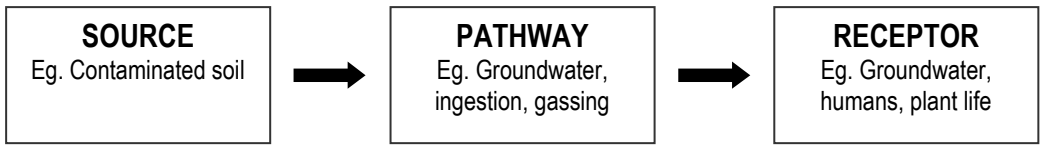
This section of the report aims to identify land which could potentially be affected by contamination, such that it could affect the value or re-use of the land, or such that mitigation would be required for certain proposed end uses of the land.

Potential contamination sources and environmentally sensitive receptors have been discussed in Section 4.10. Potentially significant risks are evaluated as part of the subsequent sub-sections.

6.1 Source-Pathway-Receptor linkages

The risk assessment uses a 'Source-Pathway-Receptor' methodology for assessing whether a source of contamination could potentially lead to harmful consequences. This means that there needs to be a pollutant linkage from source to receptor for harm to be caused, this linkage consisting of: a source of pollution; a pathway for the pollutant to move along; a receptor that is affected by the pollutant.

The current potential risks to site arising from various source-pathway-receptor linkages are assessed below. A risk may be considered significant if all three of the stages are present and therefore providing a pollution linkage. The various sources, pathways and receptors are considered separately. The assessment is based on the future use, which is understood to be residential with garden areas and hardstanding.



Type of Contamination	Potential sources	Potential Pathway	Potential Receptors	Pollution linkage	Comment	Estimated level of risk
Ground Gas	Landfill on site Former pond on site	Inhalation of Vapours	Construction/ maintenance workers	**Potentially Active**	Potential risk of ground gas- anticipated inert landfill and clay geology lowers risk	Low-Moderate
		Vapours penetrating unprotected buildings	Future site users	**Potentially Active**	Potential risk of ground gas- anticipated inert landfill and clay geology lowers risk	Low-Moderate
Near surface Contaminants within soils	Landfill on site Former pond on site	Ingestion, inhalation, dermal contact	Current site users	**Potentially Active**	No significant visual/olfactory evidence of contamination on site, risk is lowered further within hardstanding areas	Low
			Construction workers	**Potentially Active**	Significant contamination is not anticipated on site; however ground investigation is required to confirm this. PPE should minimise risk	Low
			Future site users	**Potentially Active**	Potential contamination risk from former garages on site- ground investigation required to confirm risk levels	Moderate
		Ingestion, inhalation, dermal contact	Adjacent land users	**Potentially Active**	Significant contamination is not anticipated on site; however ground investigation is required to confirm this	Low
		Direct contact	Structures	**Potentially Active**	Significant contamination is not anticipated on site; however ground investigation is required to confirm this.	Low
		Absorption in root zone	Plants	**Potentially Active**	Significant contamination is not anticipated on site; however ground investigation is required to confirm this.	Low
Mobile contaminants, leachables from on-site sources	Landfill on site Former pond on site	Leaching into groundwater	Groundwater	**Potentially Active**	Contamination migration risk via groundwater is low due to the anticipated clay geology	Low
		Off site migration in groundwater	Abstractions 400-500m	**Potentially Active**	No sensitive water abstractions within 1000m (cooling for industrial processes). No visual or olfactory evidence of contamination within the stream, former landfill anticipated to be inert. Contamination migration risk via groundwater is low due to the anticipated clay geology.	Low
			Controlled waters	**Potentially Active**	No visual or olfactory evidence of contamination within the stream, former landfill anticipated to be inert. Contamination migration risk via groundwater is low due to the anticipated clay geology. Ground investigation is required to confirm this.	Low/ moderate
Mobile Contaminants, leachables e.g. from pollution sources adjacent to site	Former landfill/reservoir Industrial land uses Railway	Leaching into groundwater	Groundwater	**Potentially Active**	Contamination migration risk via groundwater is low due to the anticipated clay geology. Sources are down gradient of the subject site	Low
		Off site migration in groundwater	Abstractions	**Inactive**	No water abstractions on site	Low
			Controlled waters	**Potentially Active**	Watercourse on site is located up stream of the existing industrial land uses. It is unknown whether the watercourse on site passes beneath the existing railway, there was no visual or olfactory evidence of contamination within the stream therefore the risk is lowered. Ground investigation required to confirm	Low/ moderate
Organic and Inorganic contaminants within soils / groundwater	Former garages on site	Potable water supply pipes	Utilities workers	**Potentially Active**	Significant contamination is not anticipated on site however ground investigation is required to confirm this.	Low

6.2 Summary

In this qualitative risk assessment, a **Low to Low-Moderate** risk implies that limited remedial action is likely to be necessary at the site, although until a contamination ground investigation is carried out this cannot be confirmed.

6.3 Geotechnical Constraints

- Existing trees may influence foundations should clay strata be encountered on site
- Localised deepening of foundations may be required in the vicinity of the former landfill area and pond depending on the extent of made ground in this locality.

7 SCOPE OF GROUND INVESTIGATION

7.1 Objectives of the Ground Investigation

The objectives of the intrusive ground investigation will be to:

- Clarify the 'Initial Contamination Conceptual Model'.
- Clarify the initial risk assessment.
- Benchmark the contamination status of the site.
- Provide data for the design of any remedial works that may be required.
- Provide a geotechnical appraisal for the site

7.2 Proposed Ground Investigation Scope

On assessing the previous potential risks on site, we have compiled the following recommendations for further investigation.

- Trial pits using a JCB 3CX.
- 3 No small diameter boreholes to 3.00mbgl installed with ground gas/water monitoring wells targeted to the former landfill area and pond
- 6 No ground gas/water monitoring visits over a period of at least 3 months with a variety of weather conditions (at least one visit should take place when the barometric pressure is <1000kPa). Should significantly elevated levels of gas be encountered, monitoring length and number of visits is subject to change.
- 8 No soil samples (made ground and natural) within the **former landfill area and pond** taken for chemical analysis to benchmark contamination levels across the site targeted to garden areas which will be the key pathway. Proposed testing will include but not be limited to the following; heavy metals suite (comprising; As, Cd (low level), Cr Vi, Pb, Hg, Se, Ni, Cu, Zn), Organic Matter, Sulphate, pH, speciated polycyclic aromatic hydrocarbons, TPH CWG and asbestos. This is based on a 25m grid system.
- 20 No soil samples (made ground and natural) within the **remainder of site** taken for chemical analysis to benchmark contamination levels across the site targeted to garden areas which will be the key pathway. Proposed testing will include but not be limited to the following; heavy metals suite (comprising; As, Cd (low level), Cr Vi, Pb, Hg, Se, Ni, Cu, Zn), Organic Matter, Sulphate, pH, speciated polycyclic aromatic hydrocarbons, TPH CWG. This is based on a 50m grid system
- Should elevated determinant levels be encountered, additional leachate testing within soil and/or groundwater testing may be required.

The scope of works should be agreed with the Local Authority prior to the intrusive ground investigation and as such may change

8 REFERENCES

8.1 BS 5930:1999 Code of Practice for Site Investigation.

8.2 R & D Publication CLR 8 (March 2002) Assessment of Risks to Human Health from Land Contamination: An Overview of the Development of Soil Guideline Values and Related Research. Environment Agency.

8.3 R & D Publication CLR 10 (March 2002) The Contaminated Land Exposure Assessment Model (CLEA): Technical basis and algorithms. Environment Agency.

8.4 Contaminated Land Risk Assessment; a Guide to Good Practice; CIRIA C552: 2001.

8.5 BRE 211 Radon: guidance on protective measures for new buildings (including supplementary advice for extensions, conversions and refurbishment) (2007 edition)

8.6 British Geological Survey Map Sheet 097 (1:50 000)

8.7 Assessment of risks to human health from land contamination: an overview of the development of guideline values and related research. EA, 2002

8.8 *Contaminated Land Risk Assessment; A Guide to Good Practice; CIRIA C552: 2001.*

8.9 *Health and Safety in Construction, HSG150, HSE, 1996.*

8.10 *Baker W (1987), Investigation Strategy - lecture at City of Birmingham Development Department Symposium on Methane Generating Sites, 9 December 1987, Industrial Research Laboratories, Birmingham*

8.11 *NHBC Standards, Chapter 4.2, 2003 Building Near Trees*

8.12 *'Guidance on Evaluation of Development Proposals on Sites Where Methane and Carbon Dioxide are Present', Report Edition No.04 March 2007 NHBC – designed for use with low rise residential properties*

8.13 *CIRIA C665 'Assessing risks posed by hazardous ground gases for buildings' 2007 - for high rise residential / flats*

8.14 *BS8485:2007 'Code of practice for the characterization and remediation from ground gas in affected developments'*

8.15 *BRE 414 'Protective measures for housing on gas-contaminated land' Roger Johnson, Parkman Environment 2001*

8.16 *BS 8500- 1:2006 'Concrete – Complementary British Standard to BS EN 206-1 – Part 1: Method of specifying and guidance for the specifier' November 2006*

8.17 *'Planning Policy 23:Planning and Pollution Control' Office of the Deputy Prime Minister 2004*

8.18 *CLR11 'Model Procedures for the Management of Land Contamination' DEFRA 2004*