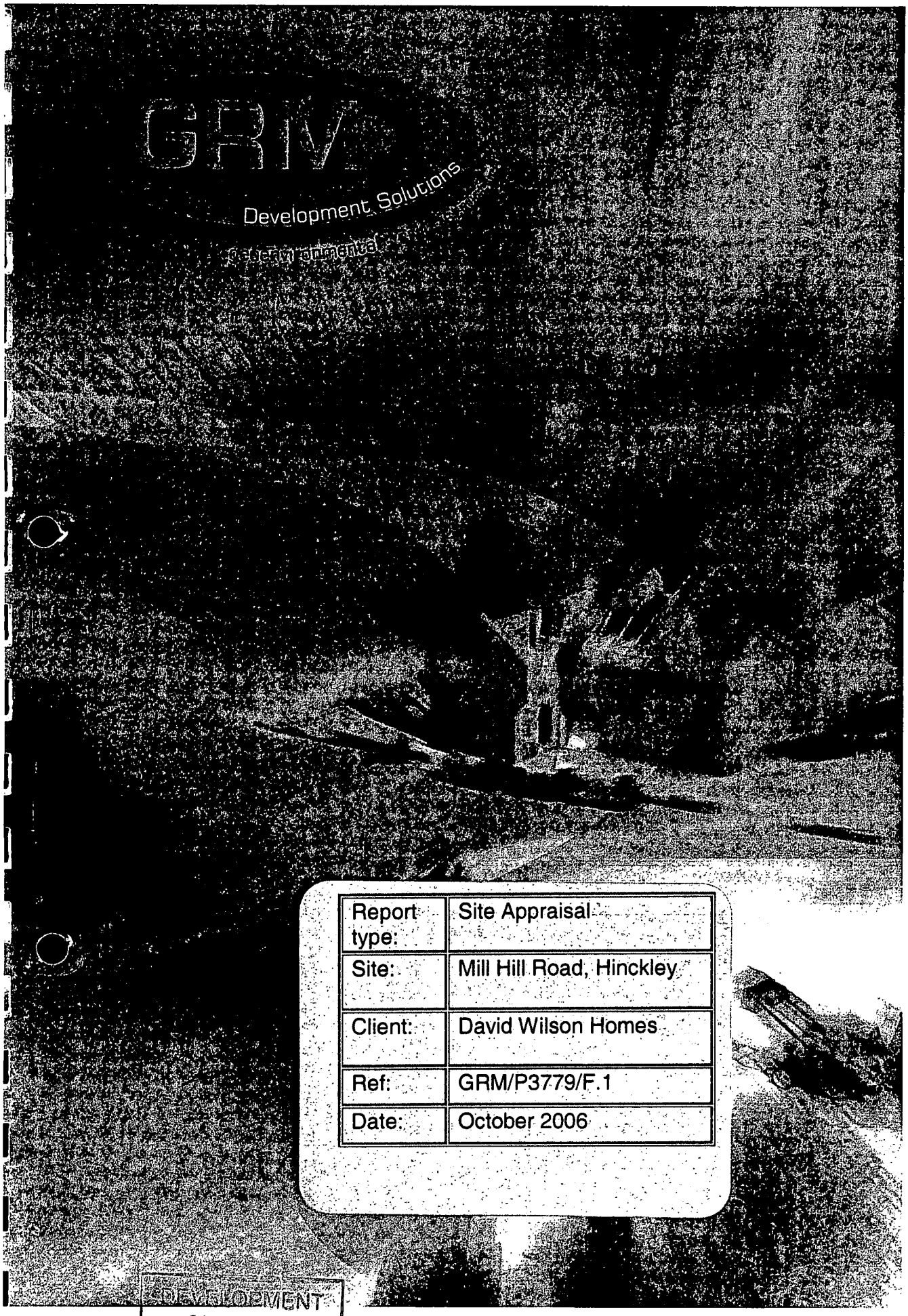

Report type:	Site Appraisal
Site:	Mill Hill Road, Hinckley
Client:	David Wilson Homes
Ref:	GRM/P3779/F.1
Date:	October 2006

DEVELOPMENT SERVICES
21 MAY 2009
RECEIVED

Site Appraisal for Mill Hill Road, Hinckley

SUMMARY OF RECOMMENDATIONS

Where further assessment is required it is indicated with a "Y" in the right hand column		
Proposed Development	Up to 2 storey houses and apartments	
CONTAMINATION ASSESSMENT - REMEDIATION / WASTE DISPOSAL		
End Users	Possibly - Hotspot removal and cap gardens	Y
Site Workers	No	
Construction Materials	Water supply pipes - possibly. Concrete - No.	Y
Groundwater	No	
Surface Water	No	
Waste Disposal (may include soils, asbestos, oil drums, chemical containers, etc)	Client has a duty of care to ensure that all waste is disposed appropriately to a licensed landfill. The landfill receiving the waste may request additional 'WAC' testing analysis. Waste characterisation can only be confirmed by the landfill site.	
GEOTECHNICAL ASSESSMENT – FOUNDATIONS		
Ground Treatment Required	Yes - vibro-replacement and earthworks to backfill cellar areas	Y
Main Bearing Strata	Clay/Granular	
Nett Allowable Bearing Pressure	130kN/m2 for trench fill and 120kN/m2 for reinforced strips on vibro stone columns	Y
Tree Influence	None	Y
Volume Change Potential	Medium	
Likely Foundation Depth Range	Minimum depth - 0.90 metres for trench fill and reinforced strip on vibro stone columns	
Excavation Hazards	Loose Made Ground susceptible to collapse	
Floor Slab Types	Ground bearing/Suspended	
Gas Protection Requirements	Basic	Y
GEOTECHNICAL ASSESSMENT – GENERAL		
Slope Stability Risk	Low	
Soakaways Potential	None	
New Access Roads	Observational CBR <2 to 5%	Y
Buried Concrete Class	DS-1, AC-1s	
Retaining Walls	Inspection of boundary retaining walls required	Y
Other Comments	Demolition of existing buildings Potential asbestos Development construction must avoid affecting vibro stone columns	Y

This summary is based on the full report that provides the detailed assessment of the ground risks affecting the development and how to manage them. It should not be used in isolation.

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1 INTRODUCTION

1.1 PREAMBLE

GRM has been appointed by David Wilson Homes (Client), to undertake a site appraisal comprising a desk study and ground investigation.

The desk study and site inspection form 'Phase I' of the assessment and allows the geotechnical and geo-environmental setting of the site to be determined and the identification of areas of particular concern that require targeted investigation. The 'Phase II' works comprise the intrusive ground investigation, geotechnical testing and chemical analysis. The information gained from the 'Phase II' works will be used to refine the conceptual model for the site and determine the most cost effective development solutions for the site.

Although the desk study information was assessed prior to the intrusive investigation works, time constraints have meant that it has not been possible to produce a separate desk study report. Therefore, for ease of reading and efficiency, the 'Phase I' and 'Phase II' aspects of the appraisal are combined within this document.

The Client proposes to develop the site with up to 2 storey housing and apartments with associated infrastructure. The proposed end use includes private rear gardens, soft landscaping and hard standing in the form of access roadways and car parking areas. The outline development proposal provided by the Client, in the form of a proposed development layout plan, is presented in Appendix A.

The Client has not informed GRM of any potential development hazards.

This site appraisal is intended to provide information that will assist decision making by identifying and recommending solutions to ground engineering and contamination issues.

GRM standard limitations of reporting are provided on the back cover of this report.

Potential Geotechnical/General Hazards reported by the Client include:
None

Potential Receptors communicated by the Client include:
Residential end use

Potential Contamination Sources communicated by the Client include:
None

1.2 OBJECTIVES OF THE SITE APPRAISAL

The Clients specific requirements were transmitted by letter/fax and verbal instruction. A rapid turnaround on reporting was required by the Client. To this end two preliminary reports have been made regarding initial assessment following the ground investigation and preliminary remediation recommendations following the receipt of expedited chemical test results.

GRM visited the site prior to the ground investigation to resolve access restrictions with the site owner. Basement units were occupied at the time of the site works and access was not practical.

The principal aims of the Site Appraisal were as follows:

a) Obtain information, from easily accessible sources, about the soil and groundwater conditions within the area of the site.

b) Determine the possible ground related geotechnical and contamination hazards within the site boundaries that may affect the proposed development.

c) Provide preliminary development recommendations.

d) Advise on further works required for the cost-effective reduction of risks to the development and procedures likely to satisfy Regulators.

Whilst every effort has been made to pre-empt the likely requirements of the Local Planning Authority and the Environment Agency, they are likely to have specific requirements that will need to be discussed and addressed at a later date.

2 PHASE I DESK STUDY AND SITE OBSERVATIONS

2.1 INFORMATION SOURCES

The following sources have been used for the identification and assessment of potential ground hazards:

- Relevant British Standards
- British Geological Survey (BGS) Geology Map Scale 1:50 000 Sheet 169
- Environment Agency Groundwater Vulnerability Map 1:100000 Sheet 23
- Historical Ordnance Survey (OS) Maps.
- Environmental Data Supplier (Landmark)
- DEFRA/Environment Agency R&D Publication CLR documents and DoE Industry Profiles.
- Building Research Establishment (BRE) Digest 211 1999 Radon: guidance on protective measures for new dwellings.
- NRPB Publication W26, Radon Atlas of England and Wales, 2002
- Client supplied information including: the location of the site, past site usage, utilities plans, proposed development layout.

Other technical references used throughout this document are detailed in the text.

2.2 SITE DESCRIPTION

2.2.1 Geographical Setting

The site is approximately 500 metres to the west of Hinckley town centre. The National Grid Reference (NGR) for the approximate centre of the site is SP 424 940. A site location and boundary plan is presented in Appendix B.

The site covers an area of approximately 0.20 hectares. The northern and western boundaries are marked by Mill Hill Road and Cleveland Road respectively. An access road and open space, associated with works to the south east of the site, form the eastern and southern boundaries.

The buildings on the site are split into numerous units. The principal uses are for the finishing of imported garments and embroidery.

The topography of the site is generally level and surrounding area slopes gently to the south east.

2.2.2 Site Inspection Observations

The site is occupied by up to two storey brick built factory units with open areas to the rear of the buildings. The eastern building is circa 1916 and contains basement areas. The western building is of a more recent age. The building contains a lift and is roofed with cement sheet (possible asbestos risk).

Site surfacing varies from concrete slabs, cobble sets, engineering bricks and tarmac.

Mr R Pearson, the owner of the site, reported that to his knowledge there have been no fuel tanks or use of solvents on the site during his eleven years occupancy.

Slopes were not apparent on the site. The south eastern corner of the site appears to have been built up to provide a level platform. The difference in levels with the land to the south east is accommodated with retaining walls up to a maximum height of approximately two metres. Much of the eastern section of the building on the site has a basement, and in reality the site is lower that the adjacent land by approximately two metres. The condition of the retaining walls was not inspected as part of this assessment.

No trees or shrubs were noted on the site.

Invasive plant species were not observed (see section on invasive plant species/ ecology).

No fly tipping was observed.

The main entry for gas and electricity to the site is from Mill Hill Road.

No overhead cables crossed the site.

Potential Geotechnical/General Hazards identified during site inspection:
Presence of cellars and pit associated with lift Existing drainage runs, foundations and other sub surface structures associated with the existing buildings Boundary stability associated with retaining wall structures

Potential Receptors identified during site inspection:
None

Potential Contamination Sources identified during site inspection:
Probable Made Ground in south east corner of site

2.3 HISTORICAL DEVELOPMENT OF THE SITE

A review of the available historical Ordnance Survey (OS) maps gives an insight into the development of the site and highlights any potential hazards. Extracts of these maps are provided in Appendix C. Relevant differences between each edition are highlighted below:

1888: The site is shown as an open field with trees. A sand pit is shown to cover much of eastern part of site. The surrounding land use is shown as residential to east and fields with occasional buildings to west.

1903: The sand pit no longer shown. Residential development is shown to the north of the site.

1924: A boot and shoe manufacturers and hosiery manufacturers are indicated over western and eastern halves of the site respectively.

1955: The western half of site is shown as cleared of buildings.

1960: The buildings on site are shown in a layout similar to that seen during the site walkover and are marked "works". The surrounding area is shown to be predominately residential. A factory and works are indicated adjacent to south east corner of site.

1968: A builder's yard and hosiery manufacturers are shown on the western and eastern halves of the site respectively.

1986: No significant change in the layout of the site is shown, however, the western half of site is unmarked, whilst the eastern half is marked as factory.

1993: Both buildings shown on site are marked as a factory.

The hazards identified are summarised in the table below.

Potential Geotechnical/General Hazards identified on OS Maps:
Sand pit on eastern half of site Existing structures Existing buried structures

Potential Receptors identified on OS Maps:
None

Potential Contamination Sources identified on OS Maps:
Previous land use associated with boot and shoe manufacturers, hosiery manufacturers, factory, builder's yard

2.4 ANTICIPATED GEOLOGY

The BGS Geological Sheet for this area shows superficial deposits of the Oadby Till and Wolston Sand and Gravel deposits over a Solid geology of the Mercia Mudstone Formation. There is no dip or fault information in the area of the site. Generally the Mercia Mudstone strata are horizontal to sub horizontal.

There are no BGS borehole records within 120 metres of the site and none have been requested as part of this assessment.

The site is not determined to be within an area of significant slope instability risk or risk from shrinkable soils by the Landmark report.

Potential Geotechnical/General Hazards from geological data:
Variable strata Shrinkable soils

Potential Receptors from geological data:
None

Potential Contamination Sources from geological data:
None

2.5 HYDROGEOLOGICAL INFORMATION

No detailed information regarding the depths to groundwater is available. The groundwater level is likely to be subject to seasonal variations.

The aquifer status of the site from both the Groundwater Vulnerability Sheet and Landmark report is non-aquifer.

There are no recorded groundwater abstractions for domestic purposes within 1000 metres of the site. The nearest non-potable abstractions are 994 metres to the east of the site.

The site is not within a Source Protection Zone.

It is not possible to estimate the depth to the permanent groundwater table or the possible groundwater flow direction from the information available at this stage.

Potential Geotechnical/General Hazards from hydrogeological data:
None

Potential Receptors from hydrogeological data:
None

Potential Contamination Sources from hydrogeological data:
None

2.6 HYDROLOGICAL INFORMATION

The nearest surface water feature recorded in the Landmark report is 424 metres to west of the site, which would coincide with the moat/pond associated with Castle Hill seen on the historical maps.

The Landmark report suggests that the site is not at risk from river flooding. A flood risk assessment may be required.

Significant pollution incidents have not occurred which may affect the site.

The nearest surface water abstraction licence is 855 metres to the south of the site and is for non-potable purposes.

Potential Geotechnical/General Hazards from hydrological data:
None

Potential Receptors from hydrological data:
None

Potential Contamination Sources from hydrological data:
None

2.7 COAL MINERAL RESOURCES

2.7.1 Coal Authority Report and Geological Maps

The Authority's Online Directory (www.coalminingreports.co.uk) provides immediate online confirmation on entering a property postcode as to whether a coal mining search is necessary or not. The site is not situated in an area where a coal mining search is required.

The Environmental data provided by Landmark confirms the site is not in an area that requires a Coal Authority Mining Report.

Potential Coal Mining Hazards:
None

2.8 OTHER MINERAL RESOURCES

The review of historical OS maps of the area indicates that a sand pit was situated on the eastern half of the site. No other such features in the area surrounding the site were determined during the review of the historical maps.

Potential Other Mining Hazards:
None

2.9 ENVIRONMENTAL INFORMATION

Environmental database information has been acquired from Landmark Data Limited. There is a considerable amount of data and not all of it is relevant to this appraisal (e.g. air pollution controls). Therefore, summary sheets are provided in Appendix D, along with copies of sheets relevant to this report. The full set of data will be held on file by GRM.

In summary, there are no reported hazards that may affect the proposed development.

Potential Geo-environmental/General Hazards from Environmental data:
None

Potential Receptors from Environmental data:
None

Potential Contamination Sources from Environmental data:
None

2.10 ARCHAEOLOGY

Archaeological information has not been sought as part of this desk study and has not been identified as an issue by the Client. Some Local Authorities require at least an initial archaeological appraisal for development sites. GRM would be happy to provide contact details of suitable professionals for such work. Archaeological investigations occasionally reveal ground-related problems from ancient times (prior

to the 1st Edition OS maps) and can occasionally cause foundation and contamination development hazards.

Archaeological Hazards:
No known archaeological hazard

2.11 INVASIVE PLANT SPECIES / ECOLOGY

Ecological issues can have a significant effect on developments. GRM is not a specialist in this topic and has not conducted such a survey. We will, however, endeavour to report easily recognisable issues such as; Japanese Knotweed and Giant Hogweed, badger sets etc when we see them.

Invasive Plant Species Hazards:
None identified

2.12 RADON GAS (DESK STUDY ASSESSMENT)

The site is not within an area recorded to require Basic or Full Radon precautions, as shown by a statistical analysis of Radon in houses by the National Radiological Protection Board (Annex A BRE211). The site is not in an area where a geological assessment, to determine the need for Radon protection, is required (Annex B BRE211).

According to latest available information (NRPB Publication W26, Radon Atlas of England and Wales, 2002), below 1% of homes are reported to have Radon levels above the 'Action Level' in this area.

The environmental report (Appendix D) suggests that based on information provided by the BGS (equivalent to a basic radon report), no Radon protective measures will be required.

Radon Hazard Assessment (Desk Study):
None

3 SUMMARY OF POTENTIAL GEOTECHNICAL AND GEO-ENVIRONMENTAL HAZARDS

Potential hazards have been identified in earlier sections and are now summarised in tabular form, with their consequences and possible risk management actions.

3.1 GENERAL HAZARDS

General Hazards are those that pose a threat to public safety, or site safety to personnel.

Potential Hazard	Consequence	Action
Existing buildings	Danger to personnel	Demolition required - Health & Safety guidelines
Live services	Danger to personnel	Inform relevant parties for disconnection / diversion

3.2 GEOTECHNICAL HAZARDS

Geotechnical hazards are those that pose a danger to the stability and/or quality of the built environment.

Potential Hazard	Consequence	Investigatory Technique
Deep Made Ground / Buried Structures	Deepening for Foundations	Trial Pits / Boreholes
Infilled Ground	Deepening for Foundations	Trial Pits / Boreholes
Shrinkable Clay	Minimum Depth Foundations	Laboratory Testing
Existing Retaining Walls	Retaining Wall Failure	Inspection by Structural Engineer

3.3 CONTAMINATION/ENVIRONMENTAL HAZARDS

These hazards have the potential to adversely affect human health, controlled waters and the built environment.

Source	Pathway	Receptor	Assessment Method
Made Ground	Direct Contact	End-User	See section 3.4
Asbestos material associated with buildings	Direct Contact / Inhalation of Fibres	Site Worker	Asbestos survey and subsequent removal prior to demolition
Made Ground / Backfilled Sand Pits	Ingress into dwellings	End User	Gas Monitoring Survey

3.4 CONTAMINANTS OF CONCERN

The DEFRA document CLR 8 and DoE Industry Profiles have been used to assess likely contaminants from past land use and potential nearby industrial sources. For land uses where no profile is available, likely contaminants of concern have been selected by GRM based on past experience of similar sites.

The closest DoE Industry Profiles available, that of "Animal and Animal Products Processing Works" and "Textile Works and Dye Works" are not considered to be representative of boot manufacture and garment finishing activities that have occurred on the site. Accordingly there is no particular DoE Industry Profile available and a general screening suite has been used for contaminants covered by CLEA and common contaminants from the Industry Profiles.

Asbestos and PCBs are listed in the vast majority of profiles. PCBs are listed as the profiles expect electricity substations and high voltage switch boxes on all industrial sites. None have been observed on this site. Asbestos will be tested for if there is visual evidence found within the ground during the fieldwork.

There are contaminants that are generally tested for as a matter of course as their prevalence on brownfield sites is renowned. These include: arsenic, cadmium, chromium, lead, mercury, selenium, copper, nickel, zinc, phenols, cyanide (total), sulphate (water soluble), pH, and speciated PAH (polycyclic aromatic hydrocarbons).

In addition, petroleum hydrocarbons (aliphatic and aromatic bands) will be analysed if there is any evidence observed during the fieldwork. Solvents are often associated with hosiery manufacturers and although the desk study data and information from the site owner would indicate they have not been used on this site, it would be prudent to carry screen testing for solvents. It is usual to screen for various solvents by using a volatile organic compounds (VOCs) test suite.

The contaminants discussed will be compared with fieldwork observations to determine laboratory analysis suites for testing soils and waters (see later section).

4 PHASE I CONCEPTUAL MODEL

4.1 SOURCE-PATHWAY-RECEPTOR

The consideration of contamination is based upon the principles of risk assessment. Risk assessment is founded upon the use of so called 'source-pathway-receptor' principles in order to establish the presence, or potential presence, of a pollutant linkage.

For a risk to exist, contamination must have the potential to cause harm to susceptible targets or receptors such as humans, the water environment or the built environment. The potential for harm to occur requires three conditions to be satisfied:

- The presence of substances that may cause harm (SOURCE),
- The presence of a target which may be harmed (RECEPTOR),
- The existence of a plausible pollutant linkage between the source and the receptor (PATHWAY).

In the absence of a plausible pollutant linkage or pathway there is no risk. For this site to pose a risk to the end-users or controlled waters a contamination source and pollutant linkage must be demonstrated.

4.2 POTENTIAL RISK TO HUMAN HEALTH

From the preceding information a conceptual model for human health has been formulated which illustrates the following.

4.2.1 Sources

Potentially contaminated Made Ground across the site. Contaminants of concern include Heavy Metals, inorganic contaminants, PAHs and VOCs. No sources of petroleum hydrocarbons have been identified.

The Made Ground and backfilled sand pit is a potential source of harmful ground gas, principally Methane and Carbon Dioxide.

The existing and past building structures are a potential source of Asbestos containing materials (cladding and lagging materials, thermal/electrical insulation, roofing materials, etc).

4.2.2 Pathways

Made Ground - Direct contact (dermal) with contaminated soils and materials; ingestion of contaminated soil and soil attached to vegetables, ingestion of soil dust; inhalation of soil vapours.

Migration of ground gas from Made Ground into dwellings.

Existing Structures - Inhalation of Asbestos containing materials (fibres) from cladding and lagging materials, insulation materials, roofing materials, etc.

4.2.3 Receptors

The primary receptors on this site the end-users, including site workers (demolition, construction and site maintenance phases) and residents of any subsequent residential development.

4.2.4 Conclusion

The risk the site poses to human health, based on the information available prior to the intrusive investigation, is considered to be low.

4.3 POTENTIAL RISK TO CONTROLLED WATERS

The site is classified as non-aquifer. There are no nearby surface or groundwater abstraction licenses. The nearest surface water feature is a moat and is not considered to be in hydraulic continuity with the site. Therefore the site does not pose a risk to controlled waters.

4.4 POTENTIAL RISK TO CONSTRUCTION MATERIALS

From the preceding information a conceptual model for construction materials has been formulated which illustrates the following.

4.4.1 Sources

Potentially contaminated Made Ground across the site. Contaminants of concern include Heavy Metals, inorganic contaminants, PAHs and VOCs.

4.4.2 Pathways

Made Ground - Direct contact, leaching and migration of contaminants.

4.4.3 Receptors

The primary receptors are the underground plastic pipes and buried concrete.

4.4.4 Conclusion

The risk the site poses to construction materials, based on the information available prior to the intrusive investigation, is considered to be low.

5 PHASE II GROUND INVESTIGATION

5.1 FIELDWORK

The ground investigation (including fieldwork, sampling, monitoring and laboratory analyses) has been designed to identify and assess potential ground related problems and to allow cost effective solutions to be determined. Where time and access constraints allowed, the ground investigation has been planned on the basis of the desk study, site inspection and the proposed development layout. All fieldwork and soil descriptions were carried out in general accordance with relevant British Standards.

Window sampling techniques were selected to investigate this site because of access restrictions.

The exploratory holes have been manually positioned and advanced to depths to determine the general ground/groundwater/gas conditions below the site. Within the constraints of the access restrictions applicable to this site, a general 30 metre grid spacing was adopted, laid out on a herringbone grid spacing (CLR4). Some holes were targeted at particular hazards identified in the Phase I assessment. The resultant exploratory hole density is commensurate with the complexity of the site conditions and detail of information required for this phase of the investigation.

The exploratory hole location plan and exploratory hole logs are presented in Appendix E and Appendix F respectively. A total of fifteen exploratory holes were undertaken, to depths of between 3.00 and 7.00 metres begl.

The intrusive ground investigation fieldwork was conducted on the 20 and 21 September 2006, with groundwater/gas monitoring visits continuing after that period. The rationale for the positioning of the individual exploratory holes is illustrated in the table below:

LIST OF TARGETED EXPLORATORY HOLES	
Exploratory Hole	**Reason for Location and Type**
WS1	General grid/Sand Pit
WS 2	General grid/Sand Pit/Raised area
WS 3	General grid/Raised area
WS4	General grid/Sand Pit/Raised area
WS5	General grid/Sand Pit
WS6	General grid/Raised area
WS7	General grid/Sand Pit/Raised area
WS8	General grid
WS9	General grid
WS10	General grid
WS11	General grid
WS12	General grid
WS13	General grid
WS14	Hydrocarbon Hotspot
WS15	Hydrocarbon Hotspot
WS = Window Sample hole	

The area of basement to the rear of WS1 and factory area over the western half of the site were not practically accessible to the ground investigation. Access was agreed in the north western corner of the factory building, however, it was possible to place WS13 outside of the factory building, but adjacent to the target area to reduce disturbance to the occupants of this unit. Inaccessible areas are indicated on the Exploratory Hole Location Plan, Appendix E

Samples not used for testing will be stored for a month after issue of this report and then disposed of, unless the client requests in writing that they be kept.

5.2 MONITORING INSTALLATIONS

Gas measurement equipment included an LMSxi Multifunction Gas Analyser.

Short term temporary standpipes have been installed within selected window sample boreholes. Three monitoring visits have been completed within a four week period since the fieldworks were completed.

Post fieldwork monitoring has been designed to identify and assess the groundwater and gas regimes below the site. The results are presented in Appendix G. Long-term monitoring was impractical, however, the existing data can be combined with the interpretation of the ground and experience of similar sites to allow for reasonable predictions.

5.3 PROVEN GROUND

The encountered ground conditions were:

- Made Ground
- Superficial Deposits

5.3.1 Made Ground

The surfacing encountered at the exploratory hole locations comprised engineering bricks, tarmac, tarmac over concrete, concrete and concrete over brick to depths of between 0.05 to 0.23 begl.

The Made Ground encountered below the surfacing was highly variable in both depth and composition. Depths of Made Ground ranged from 1.50 to 4.50 metres begl over the eastern half of the site and 0.40 to 1.90 over the western half of the site.

The Made Ground comprised sandy, gravelly clays, sandy clays and clayey, gravelly sands. It is considered that the Made Ground comprised locally derived natural materials with foreign clasts, generally less than 5%, including brick, coal, glass, slate, concrete, ash, clinker and carbonaceous material.

Made Ground, with a significant content of full bricks with small voids to 1.00 metres begl, was encountered in WS13. Slight humic organic odours were noted in WS7 (0.40 to 0.70m begl). Strong hydrocarbon odours, similar to diesel fuel, were noted in WS8 throughout the Made Ground. WS 14 and 15, adjacent to WS8, did not encounter hydrocarbon odours.

The soils strengths were loose or medium dense in the granular horizons and firm, locally soft or stiff in the cohesive soils.

5.3.2 Superficial Deposits

Interpretation of the superficial deposits was not conclusive. It is considered that they are likely to be a transitional facies between the Wolston Sand and Gravel and the Oadby Till.

Superficial strata were variable and comprised a series of interbedded Sands (locally clayey), sandy, gravelly Clays, sandy Clays and Silt. Hydrocarbon odours, similar to diesel fuel, were noted in WS8, ranging from very slight to strong, being strongest at 2.50 to 3.60 and diminishing with depth. WS 14 and 15, adjacent to WS8 did not encounter hydrocarbon odours.

In situ strengths of the soils were generally firm, varying locally to soft or stiff in the cohesive soils and loose or medium dense in the granular soils.

5.4 GROUNDWATER

5.4.1 Groundwater Initial Observations

Groundwater was encountered in WS6 at 3.50 metres begl as seepage. The remaining boreholes were dry.

5.4.2 Groundwater Monitoring Observations

The results of monitoring are reported in Appendix G and summarised below.

Groundwater level (m begl)	WS1	WS3	WS5	WS6	WS9	WS11	WS13
26/09/06	Dry	Dry	Dry	4.82	Dry	Dry	Dry
03/10/06	Dry	Dry	Dry	4.08	Dry	Dry	Dry
10/10/06	Dry	Dry	Dry	4.42	Dry	Dry	Dry

5.4.3 Groundwater Regime

The observations suggest that the window sample boreholes have not encountered the permanent groundwater table. The groundwater encountered in WS6 is likely to be perched on the natural Silts encountered beneath the Made Ground.

Long term monitoring of groundwater levels has not been conducted and interpreted levels are approximate and dependent on seasonal variations.

Due to the lack of groundwater data for the site it has not been possible to accurately determine the presence of any permanent groundwater or groundwater flow direction.

5.5 CONTAMINATION OBSERVATIONS

Fieldwork observations (visual and olfactory)
Potential contamination was encountered in as much as it was presumed to be associated with Made Ground. Petroleum hydrocarbon odours were encountered as detailed below.

	Depth (m begl)	Description of contamination and strata affected
WS1	0.00 - 1.50	Made Ground
WS2	0.00 - 3.80	Made Ground
WS3	0.00 - 1.60	Made Ground
WS4	0.00 - 1.40	Made Ground
WS5	0.00 - 2.00	Made Ground
WS6	0.00 - 4.50	Made Ground
WS7	0.00 - 3.70	Made Ground
WS8	0.00 - 3.20	Made Ground to 1.20/Hydrocarbon odours from 0.35 to 3.20 m begl (slight odour below 3.20 m begl)
WS9	0.00 - 0.55	Made Ground
WS10	0.00 - 0.70	Made Ground
WS11	0.00 - 0.40	Made Ground
WS12	0.00 - 0.40	Made Ground
WS13	0.00 - 1.90	Made Ground
WS14	0.00 - 0.90	Made Ground
WS15	0.00 - 0.90	Made Ground

Contamination Distribution
Hydrocarbon contamination appeared to be restricted to above 3.20 metres begl in WS8, and only slight odours were detected beneath this depth. WS 14 and 15 were positioned near to WS8 to determine the lateral extent of the hydrocarbon hotspot, however, no signs or odours of hydrocarbon contamination were detected.

5.6 GROUND GAS

5.6.1 Landfill Type Gases And Vapours

No potential sources of ground gas were determined in the area surrounding the site. The Made Ground within the backfilled sand pit is a potential source of harmful ground gases. Gas monitoring wells were installed in selected window sample boreholes as detailed on the Exploratory Hole Location Plan presented in Appendix E.

Monitoring results are provided in Appendix G.

There is a gradient of Carbon Dioxide concentrations across the site, being greatest in the south east corner and least in the north west corner of the site. This suggests an off site source of ground gas. See section 6.2.6 for an analysis of the results.

5.6.2 Radon Gas

The desk study risk assessment determined that no Radon protective measures are required.

5.7 SUMMARY OF FIELDWORK OBSERVATIONS

The fieldwork has revealed / confirmed the following potential hazards, receptors and sources that may not have been apparent from preceding work, which should be included when assessing the site.

Geo-environmental Hazards identified during fieldwork
Ground gas - Carbon Dioxide

Potential Receptors identified during fieldwork
None

Potential Contamination Sources during fieldwork
Hydrocarbon hotspot (WS8)
Off site source of ground gas

5.8 LABORATORY ANALYSES AND MONITORING RATIONALE

5.8.1 Chemical Laboratory Analysis

Chemical laboratory analyses were selected to provide the parameters necessary to make an initial assessment of potentially contaminated soils, for the budgetary design of the development. The choice of contamination testing was based on the identified past use of the site and site observations.

Petroleum hydrocarbon contamination was observed during the fieldwork, and appropriate testing, EPH and TPH banding was undertaken. Selected samples from WS6 were tested to determine the overall concentration and composition of the petroleum hydrocarbon contamination. Samples from WS14 and 15, were selected from a similar level to the maximum hydrocarbon odour determined in WS8, and subject to EPH testing to determine then lateral spread, if any, of hydrocarbons encountered in WS8. In addition, samples from across the site, were selected randomly for EPH and VOC screening.

Various potential contaminants identified in earlier work have been ruled out of the testing suites. These include:

- PCBs as no transformer or high voltage switches were observed
- Asbestos as none was observed during detailed logging

In addition, pH and soluble sulphate testing was also conducted as part of the chemical analysis suite to determine how aggressive the ground conditions are to buried concrete.

The chemical laboratory analysis results are presented in Appendix H.

5.8.2 Geotechnical Laboratory Testing

Geotechnical soils testing was undertaken as part of the ground investigation and appraisal of the site. Testing undertaken included Atterberg Limits (PI) classification and pH and soluble sulphate testing.

Geotechnical laboratory tests were selected to provide the parameters necessary for the budgetary design of the development including foundations and infrastructure. Laboratory test results are presented in Appendix I.

6 QUANTITATIVE RISK ASSESSMENT - HUMAN HEALTH

6.1 INTRODUCTION

The proposed development comprises up to 2 storey housing and apartments with associated infrastructure. The proposed end use includes private rear gardens, soft landscaping and hard standing in the form of access roadways and car parking areas. The proposed development layout plan is presented in Appendix A.

Various sources of contamination have been put forward in earlier text and summarised in the conceptual model. The most likely contaminated material on site was observed to be Made Ground and a petroleum hydrocarbon hotspot in the immediate area of WS8.

Representative samples of all strata and those considered to be potentially contaminated by virtue of the desk study and/or based on site observations were collected for further examination and/or potential testing.

Groundwater was not determined to be a sensitive receptor. Furthermore groundwater was not encountered in sufficient volume to allow sampling.

The Contaminated Land Exposure Assessment (CLEA) guidelines have been used to assess the risks posed to human health. For this assessment the default Soil Guideline Values (SGVs) for residential land with plant uptake have been used, i.e. a female with a start age class of one and an end age class of six. All pathways have been considered including the consumption of home grown vegetables. This has been carried out in order to provide a precautionary screening approach to assessing the risk posed to human health by the site.

The list of contaminants covered by CLEA, with specific SGVs, is not comprehensive. For selected organic and inorganic contaminants, GRM have calculated Generic Assessment Criteria (GAC) using the CLEA/SNIFFER models and published toxicological data. The GAC have been calculated using the soil conditions that produce the most conservative threshold value. Site Specific Assessment Criteria (SSAC) will be produced where the chemical analysis results exceed the GAC. The CLEA SGVs and GRM GAC used in the assessment of the site are presented in Appendix J.

Generic Assessment Criteria (GAC) have been produced using the CLEA 2002 model for the aliphatic and aromatic hydrocarbon bands. It is noted that recent EA guidance has suggested that the CLEA model should not be used for the calculation of hydrocarbon GACs or SSACs and that alternative risk assessment tools such as SNIFFER should be used. However, studies by GRM suggest the CLEA model generally produces more precautionary assessment criteria than other commercially available risk assessment tools.

To assess the risks posed from ground gases such as Radon, Carbon Dioxide and Methane, relevant current guidance has been used. For Radon the site has been assessed following the guidelines in "Radon: guidance on protective measures for new dwellings" (BRE 211 1999). See Sections 2.12 and 5.6.2. Gas monitoring has been carried out to assess the risk posed to the end user from harmful ground gases

such as Methane and Carbon Dioxide. The primary assessment tool of this risk to determine if protection measures are required is the current building regulations. The action levels for which protection measures are required are 1% by volume for Methane and 5% by volume for Carbon Dioxide.

If the gas monitoring reveals concentrations of Methane in excess of 1% by volume, then the risk to the end user will be further assessed using CIRIA Report 149, 'Protecting Developments from Methane' and follow up work by S A Wilson and G B Card, 'Reliability and risk in gas protection design'. It is planned to release a CIRIA document towards the end of 2006, which should provide up-to-date guidance for assessing risks posed by hazardous ground gases for buildings.

6.2 RISK TO END USERS

The results of contamination testing on soils are given in Appendix H.

Statistical analysis, in accordance with the principles outlined in the CLR guidance, has been used to assess the chemical analysis test results. This statistical analysis is further explained in Appendix K along with the analysis spreadsheets.

Two averaging areas have been adopted for the analysis, the western part of the site, and the eastern part of the site, where it has been determined that a sand pit and deeper Made Ground was situated. The test results for the upper one metre of material have been considered separately for each area.

6.2.1 Analysis of Similar Distribution Soil Contamination Data

Western Area
The calculated value for the US_{95} of concentrations of heavy metals, PAHs and phenols were below relevant Soils Guidance Values (SGV) or Generic Assessment Criterion (GAC).

Eastern Area
The calculated value of US_{95} for concentrations of heavy metals, PAHs and phenols were below relevant Soils Guidance Values (SGV) or Generic Assessment Criterion (GAC).

6.2.2 Analysis of Soil Hotspot Contamination Data

Western Area
When the maximum value test was applied to the data set, the following analytes were determined to be potential hotspots: Cadmium, Mercury, Zinc and various PAH species: Anthracene, Benzo (a) anthracene, Benzo (a) pyrene, Benzo (b) fluoranthene, Benzo (ghi) perylene, Benzo (k) fluoranthene, Chrysene, Dibenzo (ah) anthracene, Fluoranthene, Ideno (1,2,3-cd) pyrene, Naphthalene, Phenanthrene and Pyrene.

When the results of the various analytes failing the maximum value test were considered the following conclusions were drawn:

- Of the five samples tested for Cadmium, two were non detects and two were very close to the detection limit for the test. The fifth and final result was twice the detection limit. Given this spread of results, it is felt that the two results, where concentrations of Cadmium were below the detection level, have skewed the data set. It is concluded that the maximum value test for Cadmium is invalid.
- The test results for Mercury ranged from 0.3 to 0.5 mg/kg for all but the sample from WS12 @ 0.30/0.40 metres begl, which was 9.4 mg/kg. There is an obvious difference of magnitude between the concentrations of Mercury here and it was concluded that the sample from WS12 is likely to be a hotspot.
- The test results for Zinc ranged from 72 to 110 mg/kg for all but the sample from WS13 @ 0.80/1.50 metres begl, which was 490 mg/kg. There is an obvious difference of magnitude between the concentrations of Zinc and it was concluded that the sample from WS12 is likely to be a hotspot. Although the sample from WS12 is likely to be a hotspot, it is not considered to be a particular problem since the results of 490 mg/kg is well below the GAC for Zinc of 21 432 mg/kg.
- The concentrations of PAH for individual species were generally below detection limits with one or occasionally two of the results above detection limits. Given this spread of results for individual species, it is felt that the distribution are skewed. It is concluded that the maximum value tests for the individual PAH species are invalid. Furthermore the results above the detection limit were generally well below the relevant GAC.

Eastern Area

When the maximum value test was applied to the data set, the following analytes were determined to be potential hotspots: various PAH species namely Acenaphthene, Anthracene, Benzo (b) fluoranthene, Benzo (ghi) perylene, Fluorene, Ideno (1,2,3-cd) pyrene and Phenanthrene.

When the results of the various analytes failing the maximum value test were considered the following conclusions were drawn:

- The concentrations of PAH for individual species were generally below detection limits with one or occasionally two of the results were above detection limits. Given this spread of results for individual species, it is felt that the distribution are skewed. It is concluded that the maximum value tests for the individual PAH species are invalid. Furthermore the results above the detection limit were generally well below the relevant GAC.

6.2.3 Consideration of VOC Analysis

All of the test results for VOCs were below detection limits.

6.2.4 Consideration of Petroleum Hydrocarbon Analysis

Evidence of petroleum hydrocarbon contamination was observed in WS8.

The concentration of petroleum hydrocarbons in WS8 was determined to be 1100 and 5400 mg/kg at 0.40 to 0.60 and 2.60 to 2.80 metres begl respectively. The

sample at 2.60 to 2.80 metres was speciated and it was determined that concentrations of several of the carbon ranges were in excess of GAC values. Benzene was detected at concentrations above GAC values in this sample.

A deeper sample from WS8 and two samples from WS14 and 15, from a comparable depth range to the worst sample from WS8, ie 2.60 to 2.80 metres, were tested for EPH to determine the spread of the hotspot. The results were 8, 12 and 15 mg/kg respectively. Although there is no action level for petroleum hydrocarbons, these concentrations are not considered to be significant.

A further six samples from across the site were tested for EPH for screening purposes. The results ranged from 9 to 54 mg/kg. Although there is no action level for petroleum hydrocarbons, these concentrations are not considered to be significant.

6.2.5 Radon

Radon gas assessments have been made in earlier sections. There is not deemed to be a hazard posed by this gas. The regulators may require a detailed BGS radon report.

Accordingly it is considered that no Radon precautions are required for the proposed development.

6.2.6 Harmful Soil and Landfill Gases

The gas monitoring programme has determined that Carbon Dioxide ground gas is present on the site. Consideration of the concentration of these gases reveals that the highest concentrations of Carbon Dioxide exist on the margins of the south east corner of the site, whilst the lowest concentration exists on the north west corner. The concentration of Carbon Dioxide at intervening monitoring points decreases towards the north west. This suggests that the source of the Carbon Dioxide is situated off site to the south east.

The risk of these sources being a hazard to the development is considered moderate. Gas monitoring results are reported in Appendix G.

In summary:

- Recorded concentrations of Carbon Dioxide across the site were 0.0 to 7.8% by volume
- The general concentration of Carbon Dioxide was between 1.4 and 1.8% by volume
- Concentrations of Carbon Dioxide were highest on the south east margin of the site (WS3) and decreased to the north west
- No Methane was recorded during the monitoring program
- No gas flow was detected during the monitoring program
- Depleted Oxygen levels recorded were recorded in the wells with the highest Carbon Dioxide concentration (WS3 and 6).

As the concentrations of Carbon Dioxide ground gas are above current building regulation action level of 5% in two of the monitoring wells, gas precautions are considered to be necessary.

Since Methane has not been detected and gas flows are zero it is considered that basic precautions are adequate protection to dwellings from ingress of gas. A continuous gas impermeable membrane incorporated in the ground floor slab and cavity wall construction, sealed across the cavity and at service entry points is considerable acceptable. The minimum quality of membrane is 2000 gauge polythene. An improved grade of membrane may be required in the area of plots 1 and 2 should Benzene be proved to be present here during the additional investigation.

Further gas monitoring may be required by the Local Authority to confirm that the recommended gas precautions are adequate.

6.2.7 Summary of Risk to End User

In summary, average concentrations of potential contaminants tested for, from samples obtained from across the site, determined at the US_{95} level, were below SGV or GAC for residential with private rear garden land use.

Potential hotspots of contamination were demonstrated:

- WS12 @ 0.30/0.40m - Mercury concentration of 9.4 mg/kg
- WS8 @ 0.40 to 0.60 and 2.60 to 2.80m - EPH concentration of 1100 to 5400 mg/kg
- WS8 @ 2.60 to 2.80m - Benzene concentration of 0.016 mg/kg

In summary the risk to the end user from soil contamination is considered to be negligible outside of the hotspot areas WS8 and 12, and no remediation is considered to be necessary.

Both WS8 and WS12 are situated in areas of proposed hard standing. Therefore the pathway linkage between the contamination source and final user of the site, therefore remediation to protect the end user is not required.

Consideration should be given to the proximity of proposed rear garden areas to the hotspots (see 9.2.4).

Basic gas precautions are required to protect the final residents of the site from Carbon Dioxide ingress into dwellings.

6.3 RISK TO SITE WORKERS

Demolition and dismantling must be carried out to a safe and acceptable standard, which should be in accordance with current UK guidance and best practice.

Whilst not ground related, asbestos and hazardous substances surveys should be conducted prior to any demolition.

Ground and construction workers should be provided with basic Personal Protective Equipment including high visibility clothing, safety footwear, hard-hats, gloves and overalls based on the sites general health and safety risk assessment.

In addition, a risk assessment should be carried out for all additional hazards identified within the ground investigation in accordance with current health and safety legislation. This assessment should provide measures to reduce the risks i.e. providing further Personal Protective Equipment, welfare facilities and if necessary preventing access to certain areas.

Whilst this appraisal has considered the long-term effects of contamination, GRM can also help during the formulation of Health and Safety documentation, if required.

Any unusual colours, odours and suspicious ground should be reported immediately to site management and then GRM.

7 QUANTITATIVE RISK ASSESSMENT - CONTROLLED WATERS

The conceptual model suggests that there are no sensitive controlled waters receptors within an area that the site could affect. Furthermore, no significant groundwater was encountered during the intrusive investigation on the site.

The site is not considered to pose a risk to controlled waters.

8 QUANTITATIVE RISK ASSESSMENT - CONSTRUCTION MATERIALS

Water Supply Pipes

Contaminants were identified at concentrations that are likely to affect water supply pipes when compared to Water Regulations Advisory Scheme (WRAS) (No. 9-04-03 Issue 1), threshold levels. The US95 value for Arsenic exceeds the threshold level of 10mg/kg and the concentrations of petroleum hydrocarbons and Mercury in WS8 and 12 exceed the threshold levels of 100 and 1 mg/kg respectively.

The contaminant concentrations recorded are such that plastic MDPE water supply pipes may not be appropriate and other options such as metal (copper) pipes or Durapipe Protecta-Line System or similar, may be appropriate.

The local water authority should be contacted to determine their exact requirements in respect of the levels of contamination encountered. The water authority will view the levels of contamination present as a risk to future ground workers and a risk to end users due to ingression through failed pipes and joints.

Buried Concrete

The results of sulphate testing and a review of the strata and groundwater encountered, allows an assessment of buried concrete construction to be made.

Following the requirements outlined in 'BRE Special Digest 1 (2005), Concrete in Aggressive Ground', the Design Sulphate Class for the site should be assumed as DS-1 and the ACEC Class as AC-1s.

Sulphate and pH results are presented in Appendices H and I.

9 PHASE II CONCEPTUAL MODEL

9.1 SOURCE-PATHWAY-RECEPTOR

A ground investigation and subsequent risk assessment has allowed for refinement of the Phase I Conceptual Model.

9.2 POTENTIAL RISK TO HUMAN HEALTH

From the preceding information a refined conceptual model for human health has been formulated which illustrates the following.

9.2.1 Sources

Chemical testing and analysis of the results has determined that the proposed development is at negligible risk from the potential contamination in the Made Ground.

Hotspots of petroleum hydrocarbons (including Benzene) and Mercury, at concentrations that pose a risk to human health of the end users of the site, have been determined in the area of WS8 and 12 respectively.

The presence of the ground gas Carbon Dioxide has been determined on the site.

Radon gas protective measures are not required.

The existing building structures are a potential source of Asbestos containing materials.

9.2.2 Pathways

Made Ground - Direct contact (dermal) with contaminated soils and materials; ingestion of contaminated soil and soil attached to vegetables, ingestion of soil dust; inhalation of soil vapours and ground gas.

The hotspots of petroleum hydrocarbon and Mercury are situated in areas of proposed hard standing. The hard standing will break any plausible pathway between the source of contamination and end user receptor.

Ingress of Carbon Dioxide ground gas into dwellings.

Existing Structures - Inhalation of Asbestos containing materials (fibres) from cladding and lagging materials, roofing materials, etc.

9.2.3 Receptors

The primary receptors likely to be affected by soils contamination are the end-users of the site, including site workers (demolition, construction and site maintenance phases) and residents of the proposed residential development.

The primary receptor likely to be affected by harmful ground gases are the residents of the proposed residential development.

The primary receptor affected by any Asbestos containing materials will be the site workers (demolition / construction phase).

9.2.4 Conclusion

In general across the site, contamination at concentrations above SGV and GAC levels was not determined therefore remediation is not required to protect the end users of the site from pervasive contamination.

The hotspots of petroleum hydrocarbons and Mercury are situated adjacent to an area of proposed rear gardens for plots 1 and 2. The extent of the hotspots has not been determined in the direction of the proposed garden areas because of existing structures.

9.3 POTENTIAL RISK TO CONSTRUCTION MATERIALS

From the preceding information a refined conceptual model for construction materials has been formulated which illustrates the following.

9.3.1 Sources

Pervasive concentrations of Arsenic and hotspots of petroleum hydrocarbons and Mercury have been determined on the site at concentrations that plastic MDPE water supply pipes may not be appropriate. Other options such as are metal (copper) pipes or Durapipe Protecta-Line System may be appropriate.

No contaminant source has been identified that poses a risk to buried concrete.

9.3.2 Pathways

Permeable Made Ground - Direct contact, leaching and migration of contaminants.

9.3.3 Receptors

The primary receptors are the underground water pipes and buried concrete.

9.3.4 Conclusion

The water authority may view the levels of contamination present as a risk to both the water supply pipes and future ground workers.

The local water authority should be contacted to determine their exact requirements in respect of the levels of contamination encountered.

A risk to buried concrete from aggressive ground conditions was not determined.

10 REMEDIATION

10.1 RECOMMENDED RISK REDUCTION AND REMEDIAL MEASURES

10.1.1 Protection of End Users

Based on the assessment undertaken to date using the CLEA Model, the levels of contamination across the site, whether occurring pervasively or as hotspots, do not require remediation as part of the proposed residential development.

It is recommended that additional soil samples for Mercury and petroleum hydrocarbon analysis are obtained from the proposed garden areas for plots 1 and 2, to determine whether the hotspots encroach into these areas.

No source was determined for the hydrocarbons. Although many sources could be postulated the one that would most severely impact the future development of the site is the existence of a buried storage tank. It is recommended that trenching be carried out in the area of WS8 to investigate the possible existence of a buried tank.

These additional works should be ideally carried out following demolition and site clearance.

In the eventuality that contamination in the rear garden areas of proposed plots 1 and 2 is demonstrated, capping will be required to break the pathway linkage. The thickness of capping should be commensurate with the degree of contamination proved to be present and determined using the BRE publication 'Cover Systems for Land Regeneration - Thickness Design of Cover Systems for Contaminated Land'. For cover systems less than a metre thick and "anti dig" layer maybe required at the base of the cap.

An allowance should be made to provide a 1.00 metres thick clean cap for the rear garden area of plots 1 and 2, should elevated concentrations of Mercury and/or petroleum hydrocarbons be demonstrated. In the eventuality the petroleum hydrocarbon hotspot is more extensive than the results from WS14 and 15 suggest it is recommended that an allowance for the in situ bio remediation of the hotspot is made.

No topsoil was encountered during the ground investigation. Topsoil import will be required for garden and landscaped areas to provide a suitable growing medium for plants and shrubs.

Should any material suspected of being significantly contaminated be encountered during the redevelopment of the site, GRM can be contacted to undertake additional investigation if necessary. The local Environmental Health Officer should be contacted and informed of any additional remedial work required.

Should remediation by removal of the hotspot areas be required for either the protection of the final residents of the site (proposed plots 1 and 2) or of the water supply system, then the sides and base of resultant excavations will require validation testing, to ensure no residual contamination remains.

Following demolition of the factory buildings and hard standing, an inspection should be undertaken under floor slabs to assess any potential risk of hydrocarbon contamination of the underlying soils.

10.1.2 Protection of Controlled Waters

The risk to controlled waters is negligible. No remedial measures are required.

10.1.3 Protection of Site Workers

The risk to site workers from the soil contamination is negligible. No remedial measures are required.

However the use of suitable PPE should be enforced during the ground works stage of construction and suitable precautions should be taken during the removal of any asbestos containing materials or oil contaminated soils.

10.1.4 Protection of Construction Materials

The water authority may require all service trenches to be backfilled with clean inert material to protect the water supply from the pervasive Arsenic contamination.

Provided that the water authority accepts that MDPE pipes would be appropriate over the site, localised or total removal of the Mercury and petroleum hydrocarbon hotspots, to below the level of water mains and the placement of plastic pipes within clean backfill material may be acceptable, without the removal of further potentially contaminated materials.

The water authority may view the levels of contamination present as a risk to future ground workers.

The local water authority should be contacted to determine their exact requirements in respect of the levels of contamination encountered.

There is no risk to buried concrete, and accordingly no additional protection required.

10.1.5 Remedial Actions for Overall Ground Gas Hazard

The final residents of the site are assessed to be at moderate risk from elevated concentrations of Carbon Dioxide ground gas determined during the gas monitoring programme. The details of the risk assessment are presented in section 6.2.6.

Considering the concentrations of Carbon Dioxide encountered and the fact that neither Methane nor gas flows were detected it is considered that basic gas precautions should adequate to protect the final resident of the site from ingress of Carbon Dioxide into the dwellings. These gas precautions should consist of a minimum 2000 gauge DPM extended across the cavities and fully sealed around service entries.

Radon protective measures are not required.

10.2 POST REMEDIATION VALIDATION

Should remediation be required the method employed should be designed to avoid the need for monitoring after validation.

If remedial measures have to be undertaken to protect end-users against any potentially contaminated Made Ground, validation of these works will be required.

Verification of the remedial works will comprise validation testing of the capping material to confirm it is suitable for its intended end-use, and confirmation that the capping layer is of sufficient thickness. This verification usually takes the form of hand dug trial pits to determine the exact thickness of the soil cap.

Validation testing of any imported topsoil/capping material will be required by the local Environmental Health Officer and by the NHBC. Such verification is best conducted prior to importing the material. If subsoil/topsoil is to be imported with an existing test certificate, then it is recommended that this be forwarded to GRM to ensure that the material is suitable for use. The test certificate should be for the same suite of contaminants as contained within the GRM soils testing suite, details of which are included in Appendix H.

10.3 REMEDIATION METHOD STATEMENT

If remediation is required a method statement will need formulation after liaison with the Statutory Authorities. The statement will include the procedures to be adopted to achieve the recommended remedial measures and the form of validation testing following remediation. The recommended remedial strategy will need to be discussed with the local Environmental Health Officer / Contaminated Land Officer.

Following your review of this document, we would recommend that a copy of our site appraisal report is forwarded to the Local Authority for comment and approval, prior to commencing development of the site. The Local Authority may choose to include other consultees as part of the planning process (such as the Environment Agency).

Consultation should be undertaken at the earliest possible opportunity to avoid subsequent abortive or delayed works.

10.4 DISPOSAL AND CLASSIFICATION

Under current waste regulations, waste soil materials produced from the site will require characterisation to enable it to be disposed of correctly.

The analysis results presented in Appendix H should be provided to the relevant landfill operators to establish the characterisation of the waste, confirm its suitability for landfill disposal and provide estimated costings. It should be made clear to the landfill operator that the test results from WS8 and 12 have been determined to be hotpots and are not representative of the site in general. If material is classified as hazardous then the development site will need to be registered with the Environment Agency prior to the movement of the waste. Depending on the receiving landfill's current permit, further chemical analysis, incorporating the new Waste Acceptance Criteria (WAC) leachate analysis, may be required.

All materials removed from the site are classified as 'waste' and therefore must be removed by a suitably licensed carrier of waste. This applies whether or not the waste is contaminated.

The developer/builder are likely to be classed as the waste producer. Therefore, they have a duty of care to ensure that all waste is disposed of appropriately. This includes ensuring the waste carrier is licensed and disposes of the waste to a suitably licensed landfill site. They also required to keep a paper trail from 'cradle to grave' including copies of the waste disposal tickets.

Efficient materials management on site is recommended as it can lead to significant cost savings when compared to the traditional side casting or single stockpile of arisings. Likewise making the site as volume neutral as possible will reduce the costs of development.

The contaminated soils (waste) removed to landfill as part of an approved remediation method statement will attract Landfill Tax. GRM can assist in the application for landfill tax exemption if waste is to be removed to protect the end user or controlled waters. It should be noted that contaminated materials arising as part of normal construction activities do not normally attract the exemption. Exemption should be applied for in advance and sufficient time (6 weeks) should be allowed for this prior to development.

11 GEOTECHNICAL ASSESSMENT

11.1 INTRODUCTION

The Client proposes to develop the site with up to 2 storey housing and apartments with associated infrastructure. The proposed end use includes private rear gardens, soft landscaping and hard standing in the form of access roadways and car parking areas.

The Client has not provided the finished floor levels of the proposed structures, therefore it is assumed that finished levels will not vary appreciably from the existing ground levels. The depths of any underground engineering works (i.e. sewers, pumping stations etc.) are unknown and therefore have not been taken in to account in the following assessment. It has been assumed that any such works will not compromise foundation and ground stability.

Should the development proposals or finished levels be altered then the comments/recommendations below will require revising.

It should be noted that comments/recommendations in the following assessment are based on the results of window sample boreholes, which may not give a true indication of a soils actual engineering properties (i.e. stability, mass structure etc). It is considered that prior to development trial pitting should be undertaken to confirm the recommendations outlined below.

11.2 ENGINEERING GROUND TREATMENT

The near surface soils have the potential to be disturbed by weathering and site traffic. Precautions should be taken to avoid this as excessive disturbance may entail more onerous floor slab design, road cap thickness and increased amounts of off site disposal etc.

The near surface soils may need treatment or reinforcing to allow safe movement of construction plant and labour. An assessment by the contractor should be undertaken once the type of machinery/plant needed to complete the development is known.

Following demolition, earthworks will be required to fill the voids in the area of existing cellars and possibly the lift pit. Suitably graded and crushed demolition rubble or imported soils can be used for this purpose. Materials for filling the voids should be free of degradable materials such as wood and harmful materials such as Asbestos. Cohesive imported materials will not be suitable in light of the foundation recommendations made below. Validation testing of imported soils will be required.

The material should be laid in layers and lightly compacted to ensure an evenly compacted mass with no residual voids.

11.3 EXCAVATION CONDITIONS

No trial pit stability observations are available, however, based on the results of the window sample boreholes and observation of similar soils seen on other sites, it is likely that shallow excavations will be stable in the short term. Deeper excavations, particularly in loose Made Ground will be susceptible to collapse. Such collapse could occur without warning. The granular materials encountered on the site, whether Made Ground or natural will be highly susceptible to disturbance by groundwater ingress and catastrophic collapse may occur.

All excavations on site should be in accordance with HSE guidelines and stability should be practically maintained at all times.

Excavation of the materials encountered during the ground investigation should be easily achieved using conventional hydraulic excavation techniques. A breaker or similar plant may be required where hardstanding or existing foundations are encountered.

The observed groundwater conditions suggest that only simple dewatering techniques (e.g. sump pumping) will be needed to control water ingress to 3 metres.

An allowance should be made for trench support and dewatering of deeper excavations.

11.4 EXISTING STRUCTURES / SUBSTRUCTURES

The existing structures on the site will have associated substructures including foundation, floor slabs and drainage. Because the site has been re-developed in the past, substructure construction may be encountered outside of the footprint of the existing structures.

Where practicable, old substructures should be fully removed, however, if this is not practicable all new foundations should be carried down to fully penetrate it and it should be broken well away from all new structures.

11.5 BEARING STRATA

Foundations must not be founded in Made Ground (unless it is engineered). Buried topsoil and soft strata are not suitable for the proposed structures to found on.

The depth to natural strata levels varied considerable over the eastern half of the site from 1.60 to 4.50 metres begl. The natural deposits encountered ranged from loose and medium dense granular soils to soft to firm and firm cohesive soils. Not unexpectedly, anticipated bearing capacities, assuming conventional trench footings, varied from 60 to 130kN/m^2.

The depth to natural strata levels over the western half of the site was less varied, however, depths of between 0.40 and 1.90 metres begl were proven. The natural soils encountered were generally firm or firm to stiff cohesive soils with an anticipated bearing capacity of at least 120kN/m^2, however, a significant soft spot to a depth of 2.10 metres begl was encountered in WS14.

Given that the majority of the proposed development comprises long apartment blocks that traverse highly variable ground conditions, it is not considered that strip or trench fill foundations are appropriate for this site, with the exception of the proposed plots 1 and 2.

Soft or hard spots were inferred by the result of the window sample boreholes. If they are found during foundation excavation then they should be replaced with suitably compacted material or footings deepened to suitable strata, to avoid differential settlement.

If strata of differing bearing character (e.g. sand and clay) are encountered at foundation levels within the excavations for a single plot then the excavation depths should be altered as appropriate to ensure the foundations rest on a single stratum, or strata that will not induce differential settlement. Where this is impractical then GRM should be contacted to assess a reinforced concrete detail or in extreme cases a piled solution.

11.6 TREE INFLUENCE ON FOUNDATIONS

Ground below and adjacent to foundations is of low or moderate volume change potential (see Appendix I). It is recommended that moderate volume change potential for the shrinkable soils on the site be assumed. Compliance with NHBC Standards in Chapter 4.2 is recommended.

Trees were not encountered on the site. The site has been developed for sufficient time to assume that past tree influence is unlikely to affect the soils.

Foundations should be remote from the direct action of tree roots.

Foundation depths should account for the influence of any proposed tree planting.

11.7 TYPE AND DEPTHS OF FOUNDATIONS

Given the variable nature and depth of the natural soils encountered and the proposed development, strip or trench fill foundations are not considered appropriate, unless consistent natural soils are present at shallow depth and the proposed build is small, eg proposed plots 1 and 2.

Plots 1 and 2 could be founded on strip or trench fill foundations, 150mm into the firm or firm to stiff or stiff Clays. A minimum foundation depth of 0.90m will be applicable. An allowable bearing capacity of 130kN/m^2 should be assumed.

The majority of the remaining plots on the site are either situated in areas of deep Made Ground, or comprise long apartment blocks situated partially over deep Made Ground and traverse variable ground conditions.

It is recommended that reinforced strip foundations constructed on vibro-stone columns are adopted for plots 3 to 21. Stone columns should penetrate a minimum of 3.00m bgl in areas of shallow natural ground and be full depth in areas of deeper fill. The use of cohesive fill to re-grade to final site levels will not be permitted below the minimum foundation depth. Additional investigation is required in the south east

section of the site and between the eastern and western halves of the site to determine the steepness of the change in levels of the natural strata to assess the risk of differential settlements to foundations constructed on vibro stone columns. Subject to H&S requirements this would be best carried out following demolition but before the back filling of the void in the area of the existing cellars.

It would be prudent to allow for advance probe drilling of 30% of the vibro columns to allow for their placement in denser fill and to achieve similar column lengths at the "high walls".

All sub surface structures should be removed during the demolition works to avoid obstruction of the vibro piling works.

It should be noted that a working platform will be required by the piling contractor.

11.8 FLOOR SLABS

Ground bearing floor slabs are likely to be appropriate for plots 1 and 2, where natural ground is very shallow and less than 600mm of suitable material is likely to underlay the floor slab. Of the different floor slab types these are the types, which GRM see the most problems with. It is therefore recommended that special care be taken on checking and preparing the formation before casting.

Shallow strata are likely to become heavily disturbed by construction activities (especially during inclement weather) and care must be taken not to make it unsuitable as a bearing stratum.

Suspended floor slabs will be required across the remainder of the site, as in excess of 600mm of unsuitable material/fill was noted in the majority of exploratory positions.

Old substructures should be removed to a distance of at least 0.5m below any new floor slabs to prevent the formation of 'hard spots'.

Basic gas precautions are considered necessary for this site (see section 6.2.6 and 10.1.5).

11.9 SLOPE STABILITY AND RETAINING STRUCTURES

The site is generally level and the area surrounding the site is slopes gently to the south east. Therefore, there is no risk of slope instability occurring on the site.

There are a number of retaining walls bounding the site to the south east. An experienced structural engineer should inspect and report on these walls.

11.10 SOAKAWAY DRAINAGE

In general the strata encountered during the investigation is not suitable for soakaway drainage. Soakaway testing is required to design cost effective and appropriate soakaways to BRE Digest 365.

Generally soils that might accommodate Soakaway drainage exist in areas of deeper Made Ground. Soakaways will not be permitted into the Made Ground.

11.11 NEW ACCESS ROADS

Site observations suggest that natural materials will have CBR values of between 3% and 5%.

Untreated made ground is unlikely to be suitable as a sub-grade due to its potential variability and potentially low strength. It should be removed to a depth of 0.5m below formation level and sorted to remove any unsuitable materials. The suitable fill can then be replaced, fully compacted in thin layers. Any deficit should be made up in suitable imported fill. Following this treatment an overall design CBR of 2 - 5% should be available.

Proof rolling and the improvement of soft spots may result in CBR values of 2%.

The adopting authority should be consulted at the earliest opportunity as to local requirements regarding sub grade and testing requirements. Incorporation of a geotextile grid into sub-base layers may allow for reduced capping thickness.

Site observations should be confirmed by in situ or laboratory testing in accordance with the local adopting authority's preference.

11.12 BURIED CONCRETE

Following the requirements outlined in 'BRE Special Digest 1 (2005), Concrete in Aggressive Ground', the Design Sulphate Class for buried concrete at the site should be assumed as DS-1 and the ACEC Class as AC-1s.

The results of water soluble sulphate and pH testing of Made Ground and natural strata are shown in Appendices H and I.

12 FURTHER INVESTIGATION

Some further investigation, to determine more accurately the effect of some of the identified hazards on the development, is recommended. This includes:

- Following demolition of the buildings and lifting of hard standing, trial pitting and where appropriate chemical testing, should be undertaken to determine the extent of the hydrocarbon and Mercury hotspots
- Following demolition of the buildings and lifting of hard standing, trenching should be undertaken to determine whether a buried tank forms the source of the hydrocarbon hotspot
- Following demolition of the buildings and lifting of hard standing, trenching should be undertaken to determine the steepness of the boundary between the natural and Made Ground in the area of the sand pit
- Confirmation of recommendations for the protection of water supply pipes
- Inspection of existing retaining walls
- A remediation method statement may be required by the Local Authority / NHBC, if contaminated soils are to be removed / capped.
- Validation testing of any soils imported to back fill cellar areas
- Validation inspection and testing will be required, post remediation, to satisfy the Local Authority / NHBC.
- Asbestos survey of the existing buildings will be required to be completed by a suitable specialist company prior to demolition.

A copy of this report should be submitted to the Planning Department of the Local Authority or Local Authority EHO and, if they are to be used under the buildmark scheme or for building control regulations, the NHBC for review.

The budget costs of the further services that GRM can provide can be itemised under separate cover.

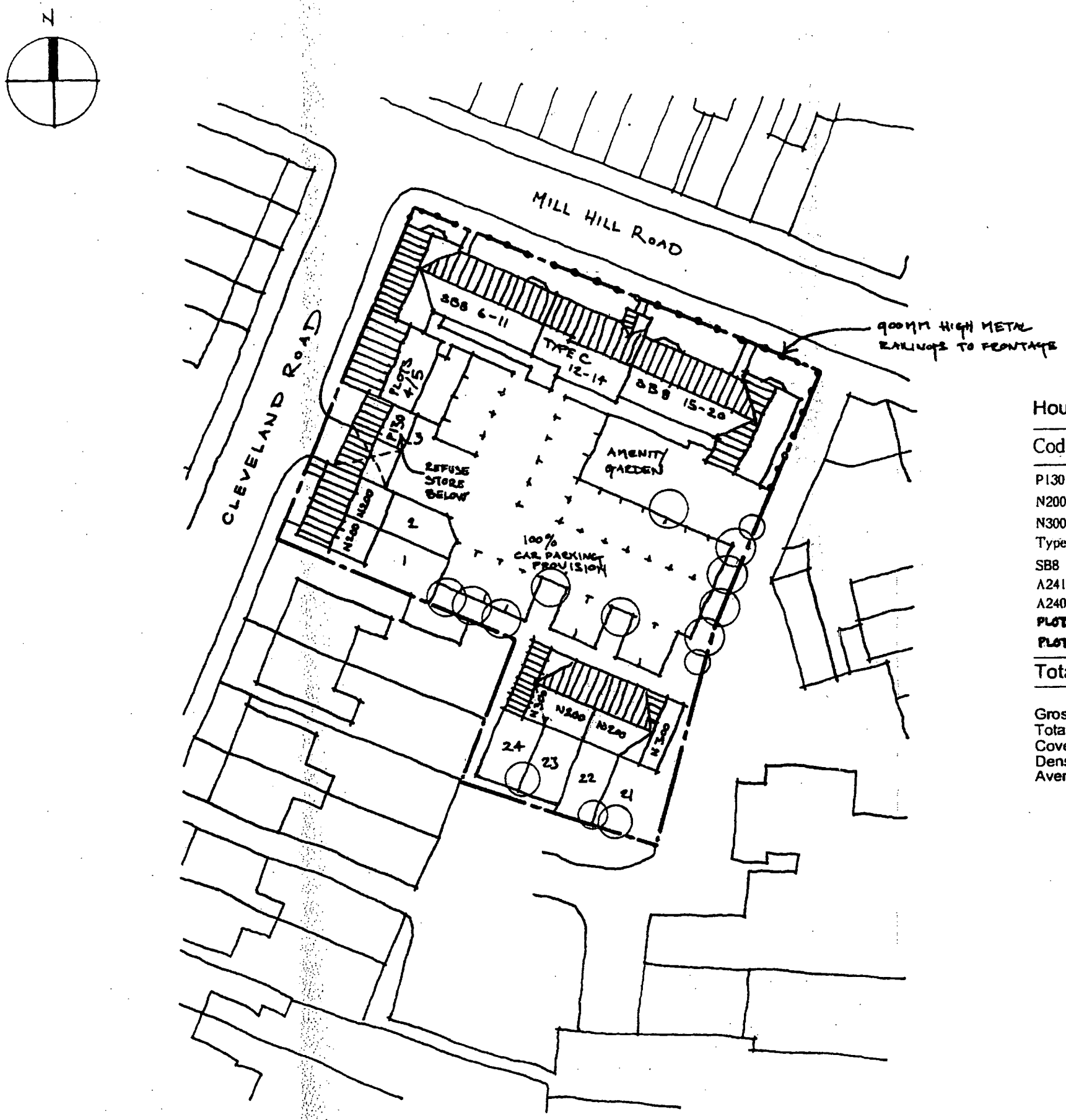
13 CONCLUSIONS

This site assessment has shown the site is suitable for the proposed development, assuming compliance with all the recommendations contained within this report.

Document prepared by	**Clive Kirby FGS CGeol** **(Principal Engineering Geologist)**
Approved by	**Dr W S Peacock FGS CGeol** **(Director)**
When required in-house geological, geotechnical, environmental, structural and civil staff helped to produce this document.	

APPENDIX A

GRM
geoenvironmental - civil - structural



House Type Schedule:

Code	sq.ft	House Type Description	No.
P130	556	1 Bed House Type	1
N200	605	2 Bed House Type	4
N300	677	3 Bed House Type	2
Type C	632	2 Bed Apartment Type	3
SB8			
A241	568	2 Bed Apartment Type	6
A240	603	2 Bed Apartment Type	6
PLOT 4	460	1 Bed Site Specific Maisonette	1
PLOT 5	605	2 Bed Site Specific Maisonette	1
Total:			24

Gross Site Area	= 0.5 Acres
Total Footage	= 14,317 sq.ft
Coverage	= 28,634 sq.ft
Density	= 120 plots/ha
Average Plot Footage	= 596 sq.ft

MILL HILL ROAD, HINCKLEY

This Feasibility Is Based on the Following

	Y	N	NK
Has site been visited	✓		
Ordnance Survey	✓		
Topographical Survey		✓	
Land Title Plan		✓	
Planning Authority Comments		✓	
Highway Authority Comments		✓	
Design Brief		✓	
Ground Report		✓	
Archaeological Report		✓	
Land Brief		✓	
Outline Consent		✓	
Full Plans Consent		✓	
S.106		✓	
Conservation Area		✓	
Density Restriction		✓	
Affordable Housing		✓	
PPG3 Compliant	✓		
Space Standards Adhered To		✓	
P.O.S. Standards Adhered To		✓	
N.R.A. Ponds, Ditchs, Easements.		✓	
Sewer/Cable Easements.	✓		
Overhead Cables		✓	
Sub Station		✓	
P.O.S. Play Equipment		✓	
Public Footpaths		✓	
Protected Species		✓	
Tree Preservation Orders		✓	
Affordable Housing		✓	
Balancing Pond Required		✓	
Flood Plain		✓	
Outfalls Known		✓	
Tree Belts		✓	
Right Hand Turn Lane		✓	
Footpath Links		✓	
Noise Precautions			✓
Access Links To Future Development		✓	
Ransom Strips			✓
Pumping Station		✓	
Traffic Calming		✓	
Road Categories And Finishes Shown	✓		
Ecological Report Required			✓
Adjoining Properties Shown	✓		

Rev.	Description	Date

DAVID WILSON HOMES
PART OF WILSON BOWDEN plc
FOREST BUSINESS PARK
CARTWRIGHT WAY, BARDON HILL, LEICESTERSHIRE
LE67 1UB
Tel: 01530 276700 Fax: 01530 813491

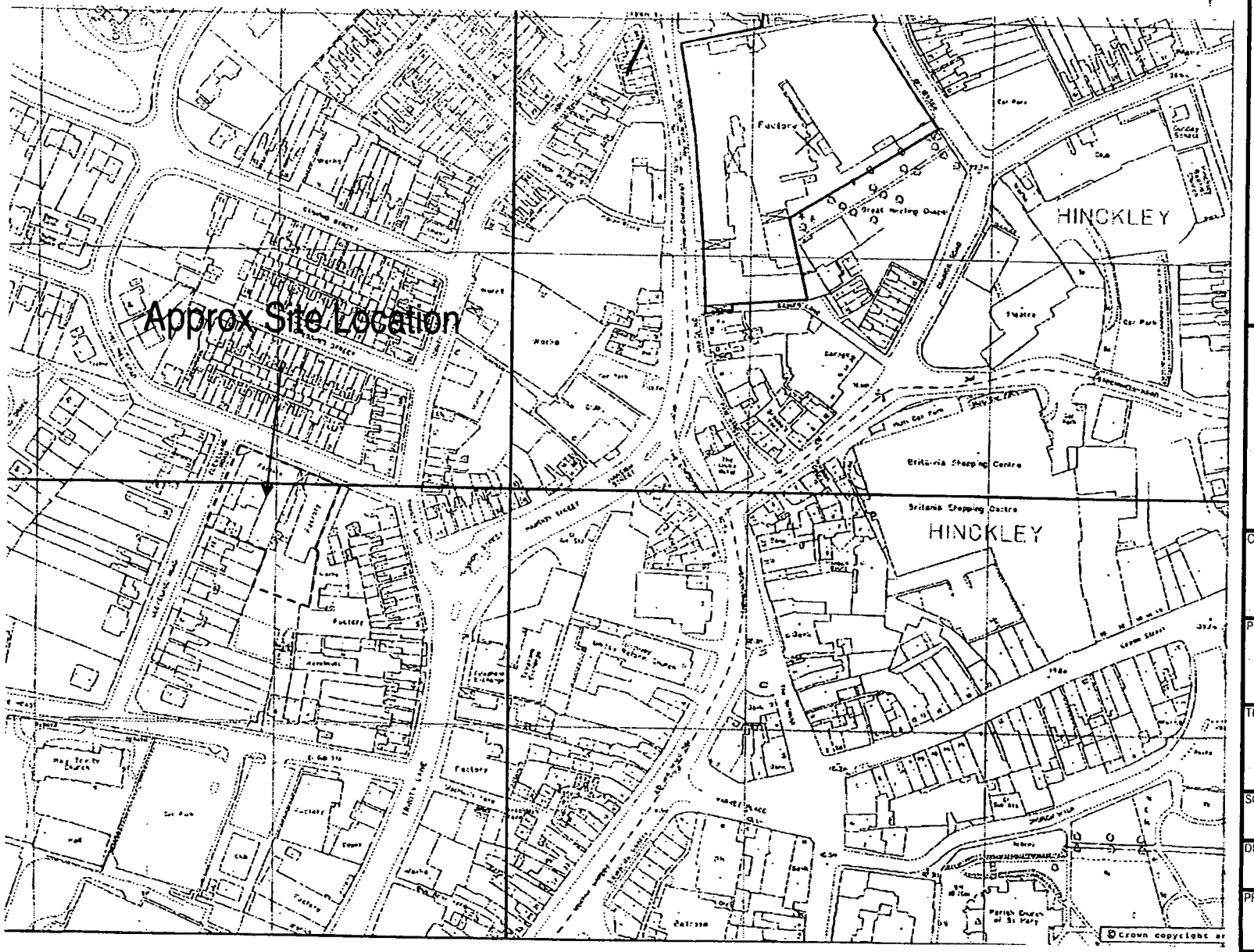
Development
MILL HILL ROAD
HINCKLEY

Drawing
FEASIBILITY LAYOUT

Scale 1:500	Dwg No.
Date 05.09.06	SK01
Drawn by GIS	

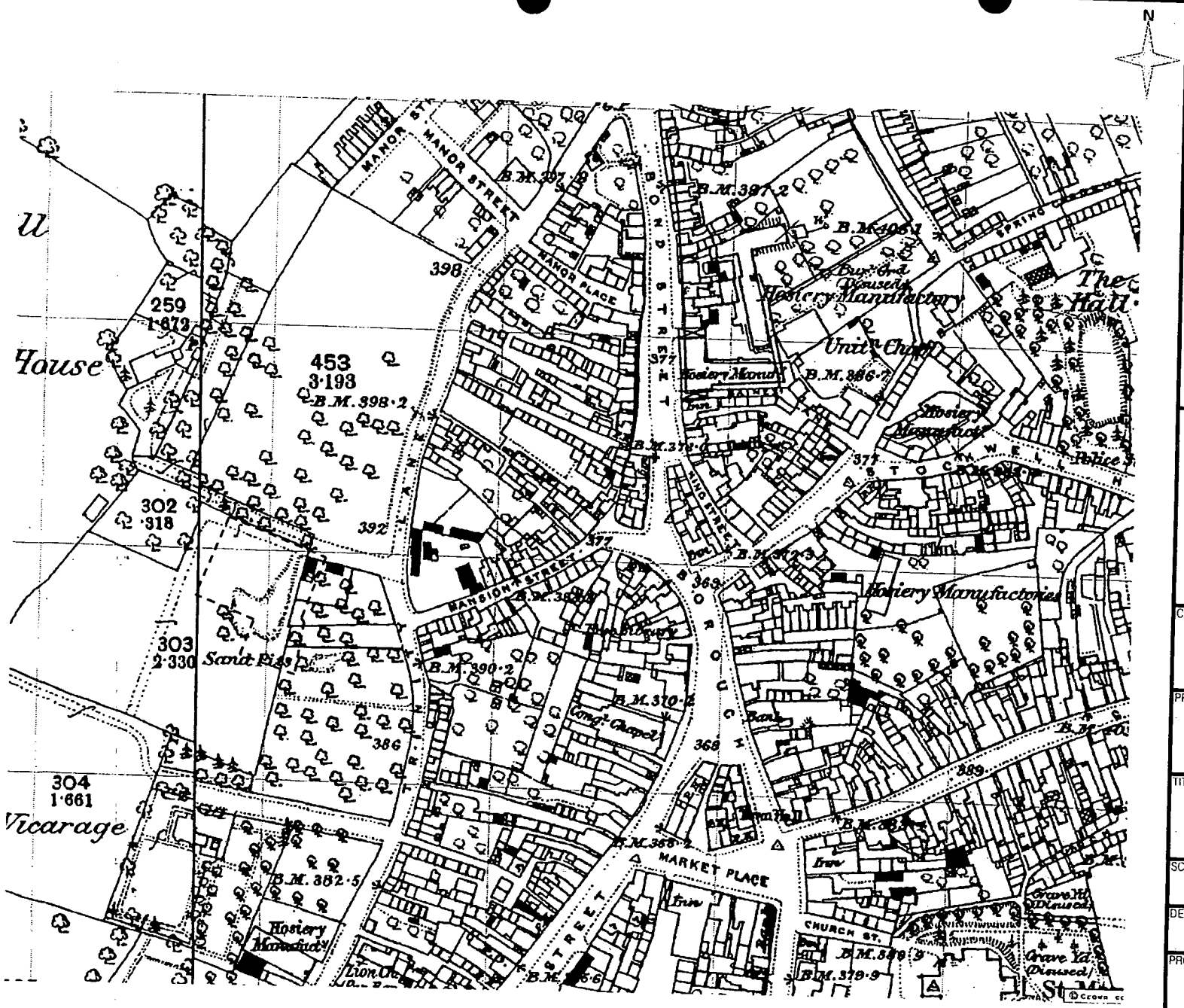
APPENDIX B

GRM Development Solutions
geoenvironmental - civil - structural


N
Approx Site Location
HINCKLEY
HINCKLEY
Britannia Shopping Centre
Britannia Shopping Centre
Factory
Factory
Works
Works
Car Park
Car Park
Factory
Factory
Factory

APPENDIX C

GRM Development Solutions
geoenvironmental - civil - structural



DO NOT SCALE

NOTES:

Approximate Site Location

GROUND RISK MANAGEMENT
Bretby Business Park
Burton-on-Trent, Staffs, DE15 0YZ
Tel: 01283 551249 Fax: 01283 211968
mail@grm-uk.com www.grm-uk.com

CLIENT:	**David Wilson Homes**
PROJECT:	**Mill Hill Road, Hinckley**
TITLE:	**Extract of OS map dated 1889**
SCALE@SIZE: NTS	ISSUE: FINAL
DESIGN/DRAWN: CIK	DATE: October 2006
PROJECT No: P3779	DRAWING No: Figure 2

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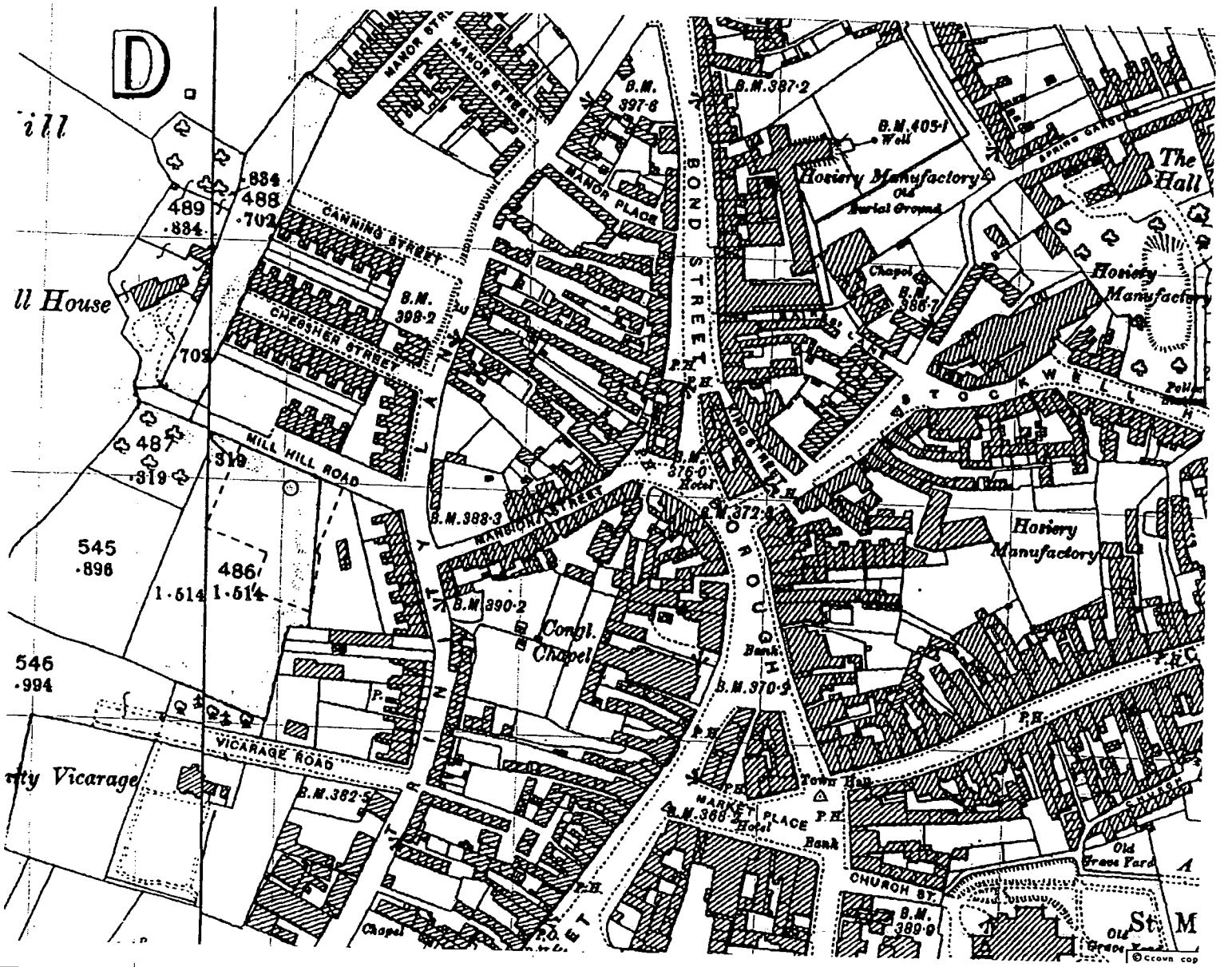

DO NOT SCALE

NOTES:

Approximate Site Location

GROUND RISK MANAGEMENT
Bretby Business Park,
Burton-on-Trent, Staffs, DE15 0YZ
Tel: 01283 551249 Fax: 01283 211966
mail@grm-uk.com www.grm-uk.com

CLIENT:	David Wilson Homes
PROJECT:	Mill Hill Road, Hinckley
TITLE:	Extract of OS Map dated 1903
SCALE@SIZE: NTS	ISSUE: FINAL
DESIGN/DRAWN: CIK	DATE: October 2006
PROJECT No: P3779	DRAWING No: Figure 3

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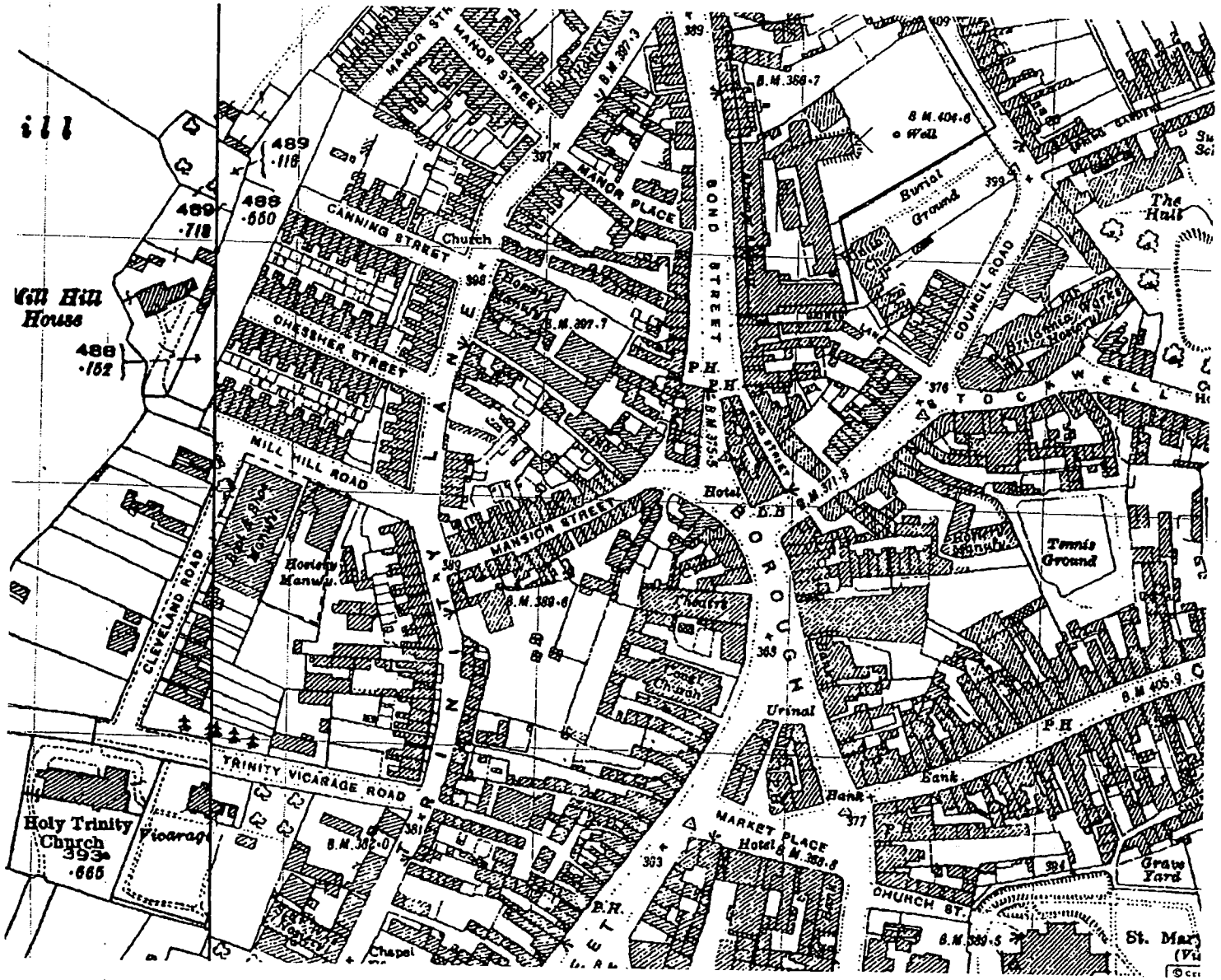

DO NOT SCALE

NOTES:

Approximate Site Location

GROUND RISK MANAGEMENT
Bretby Business Park,
Burton-on-Trent, Staffs, DE15 0YZ
Tel: 01283 551249 Fax: 01283 21[illegible]
mail@grm-uk.com www.grm-uk.com

CLIENT: **David Wilson Homes**

PROJECT: **Mill Hill Road, Hinckley**

TITLE: **Extract of OS Map dated 1924**

SCALE@SIZE:	ISSUE
NTS	FINAL
DESIGN/DRAWN: CIK	DATE: October 2006
PROJECT No: P3779	DRAWING No: Figure 4

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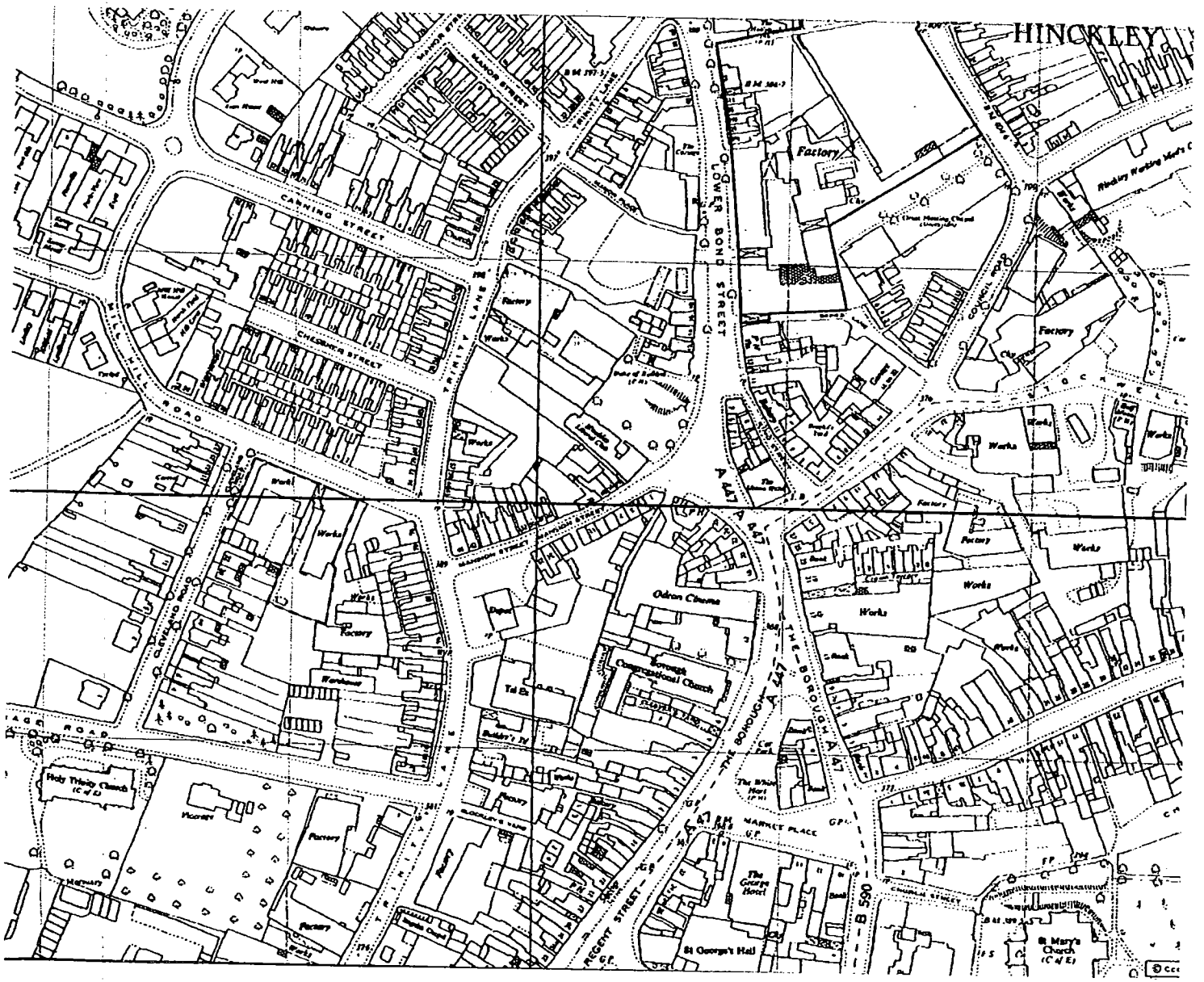

N

DO NOT SCALE

NOTES:

Approximate Site Location

GROUND RISK MANAGEMENT
Bretby Business Park,
Burton-on-Trent, Staffs, DE15 0YZ
Tel: 01283 551249 Fax: 01283 201908
mail@grm-uk.com www.grm-uk.com

CLIENT: **David Wilson Homes**

PROJECT: **Mill Hill Road, Hinckley**

TITLE: **Extract of OS Map dated 1961**

SCALE@SIZE	ISSUE
NTS	FINAL
DESIGN/DRAWN: CIK	DATE: October 2006
PROJECT No: P3779	DRAWING No: Figure 5

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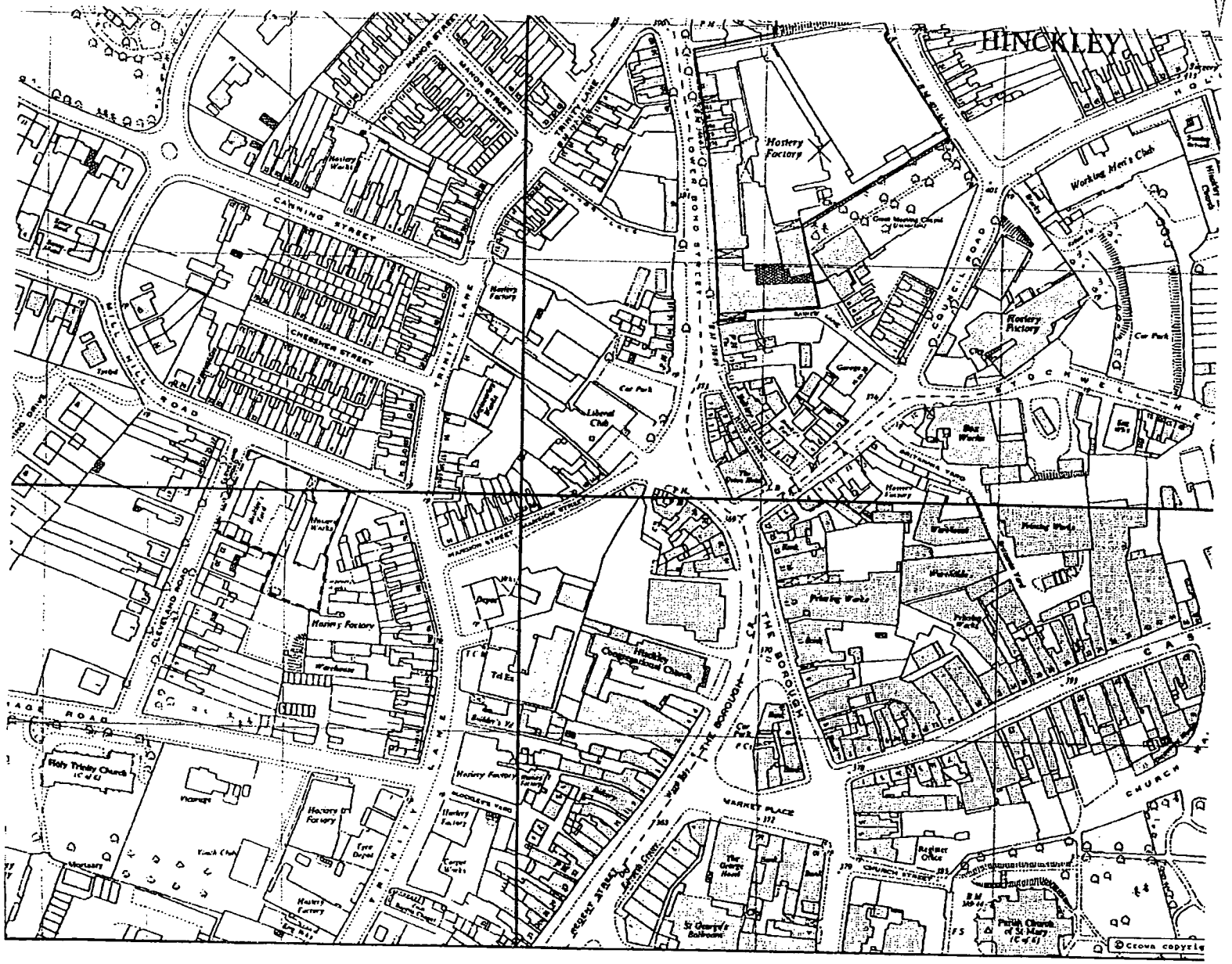

DO NOT SCALE

NOTES:

Approximate Site Location

GROUND RISK MANAGEMENT
Bretby Business Park,
Burton-on-Trent, Staffs, DE15 0YZ
Tel: 01283 551249 Fax: 01283 211968
mail@grm-uk.com www.grm-uk.com

CLIENT:
David Wilson Homes

PROJECT:
Mill Hill Road, Hinckley

TITLE:
Extract of OS Map dated 1968

SCALE@SIZE:	ISSUE
NTS	FINAL
DESIGN/DRAWN:	DATE
CIK	October 2006
PROJECT No:	DRAWING No
P3779	Figure 6

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DO NOT SCALE

NOTES:

Approximate Site Location

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Bretby Business Park,
Burton-on-Trent, Staffs, DE15 0YZ
Tel: 01283 551249 Fax: 01283 211968
mail@grm-uk.com www.grm-uk.com

CLIENT:	**David Wilson Homes**
PROJECT:	**Mill Hill Road, Hinckley**
TITLE:	**Extract of OS Map dated 1986**
SCALE@SIZE: NTS	ISSUE: FINAL
DESIGN/DRAWN: CIK	DATE: October 2006
PROJECT No.: P3779	DRAWING No: Figure 7

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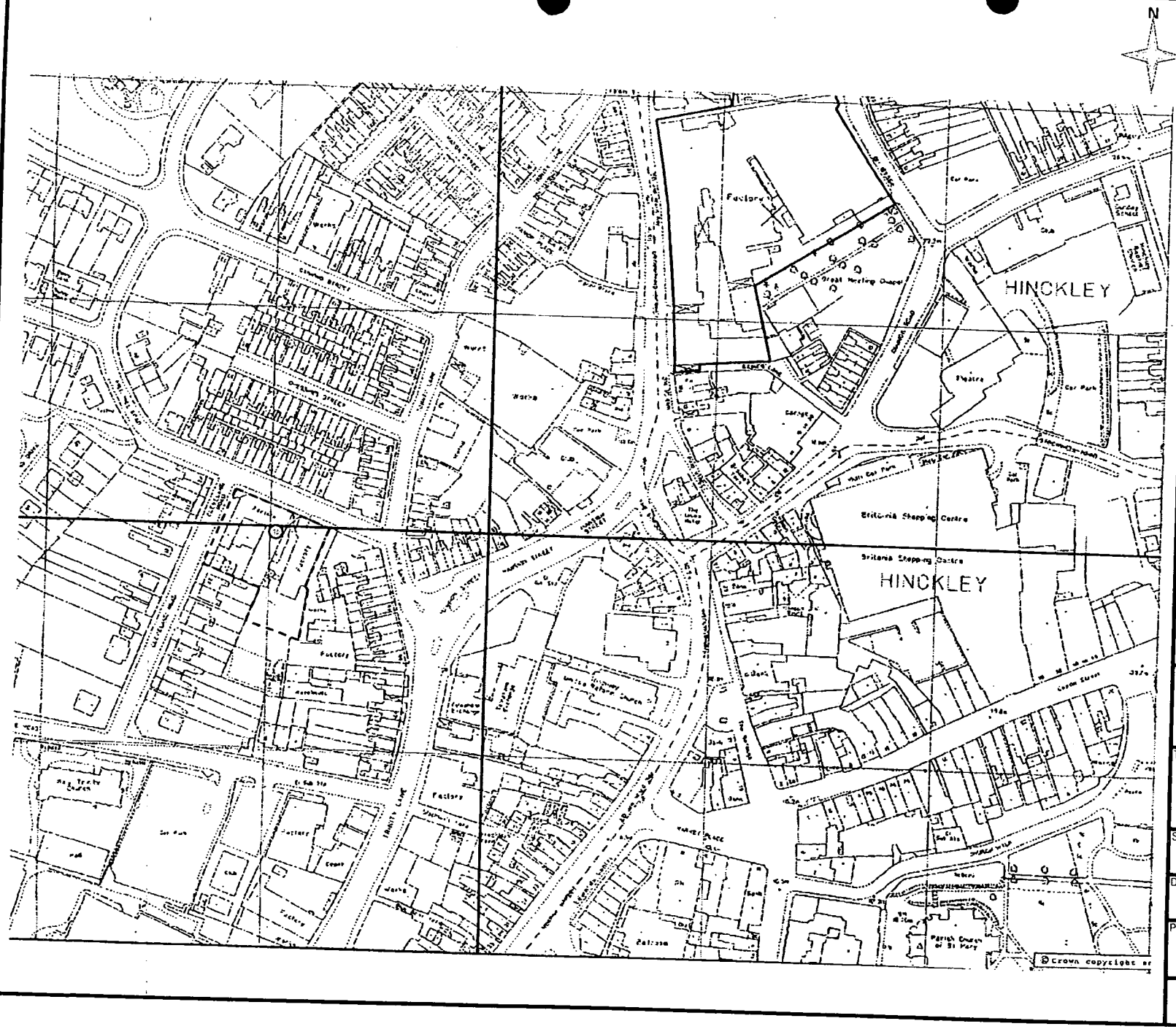

N
HINCKLEY
HINCKLEY
Britannia Shopping Centre
Factory
Theatre
Car Park
Factory
Factory
Factory

APPENDIX D

GRM Development Solutions
geoenvironmental - civil - structural

Envirocheck®

Envirocheck® Report

Datasheet

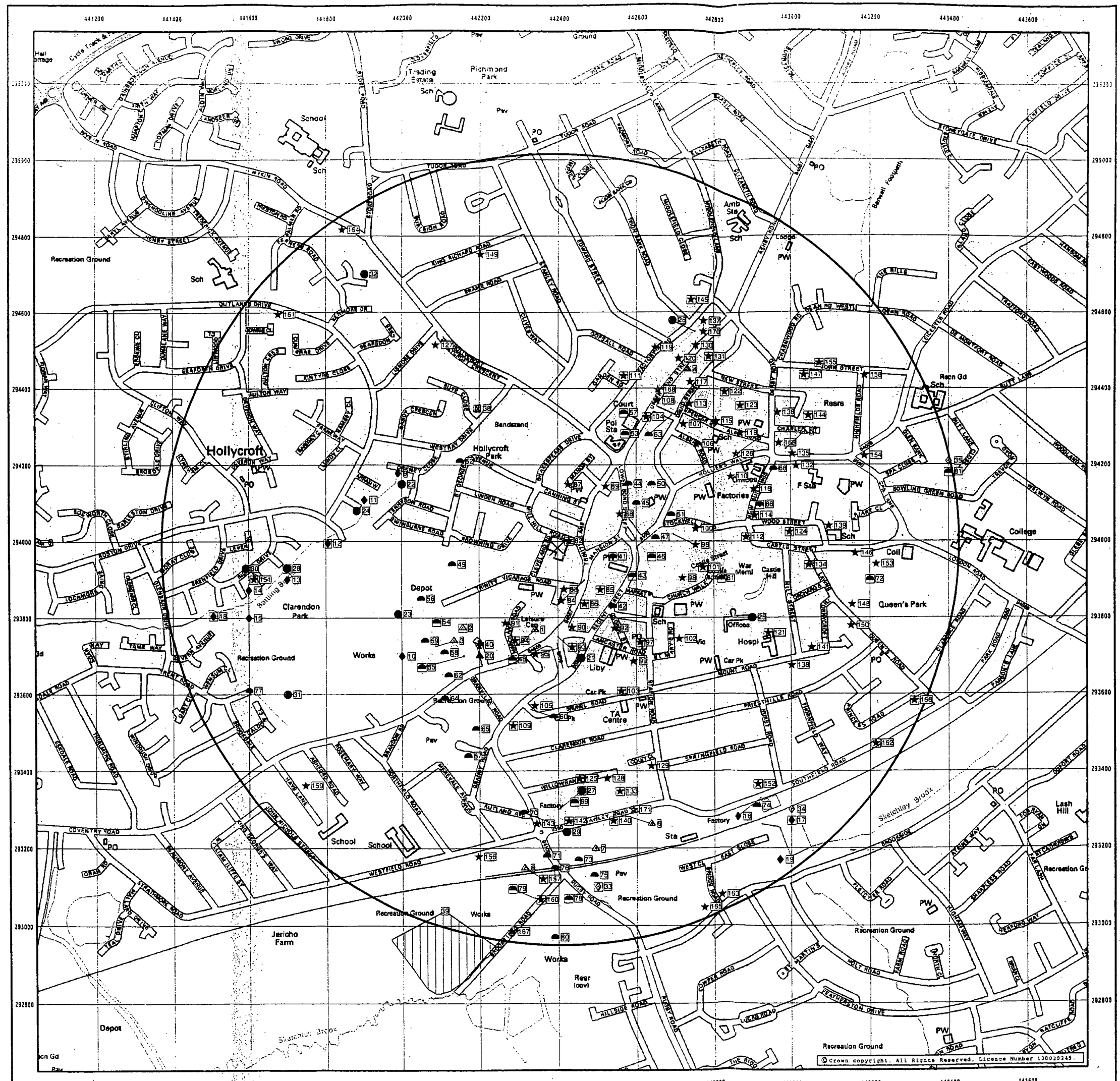
Report on:
Mill Hill Business Centre 5
Mill Hill Road
Hinckley
LE10 0AX

National Grid Reference :
442400, 293980

Site Area (Ha) :
0.20

Prepared For :
Ground Risk Management
Bretby Business Park
Ashby Road
Burton-On-Trent
Staffordshire
DE15 0YZ

Your Reference:
Dr B Peacock,P3779


Hollycroft
Hollycroft Park
Bandstand
Richmond Park
Trading Estate
Recreation Ground
Clarendon Park
Jericho Farm
Depot
Works
Rear (cov)
Queen's Park
College
Lash Hill
Castle Hill
War Memi
Barwell Footpath
Sketchley Brook
Leisure Cen
Liby
TA Centre
Hospl
Offices
Court
Pol Sta
Sta
Factories
Factory
Resrs
Recn Gd
Amb Sta
Lodge
Coll
Car Pk
Pav
PO
Sch
Ground
Depot
Works
Rear (cov)
Recreation Ground
Pav
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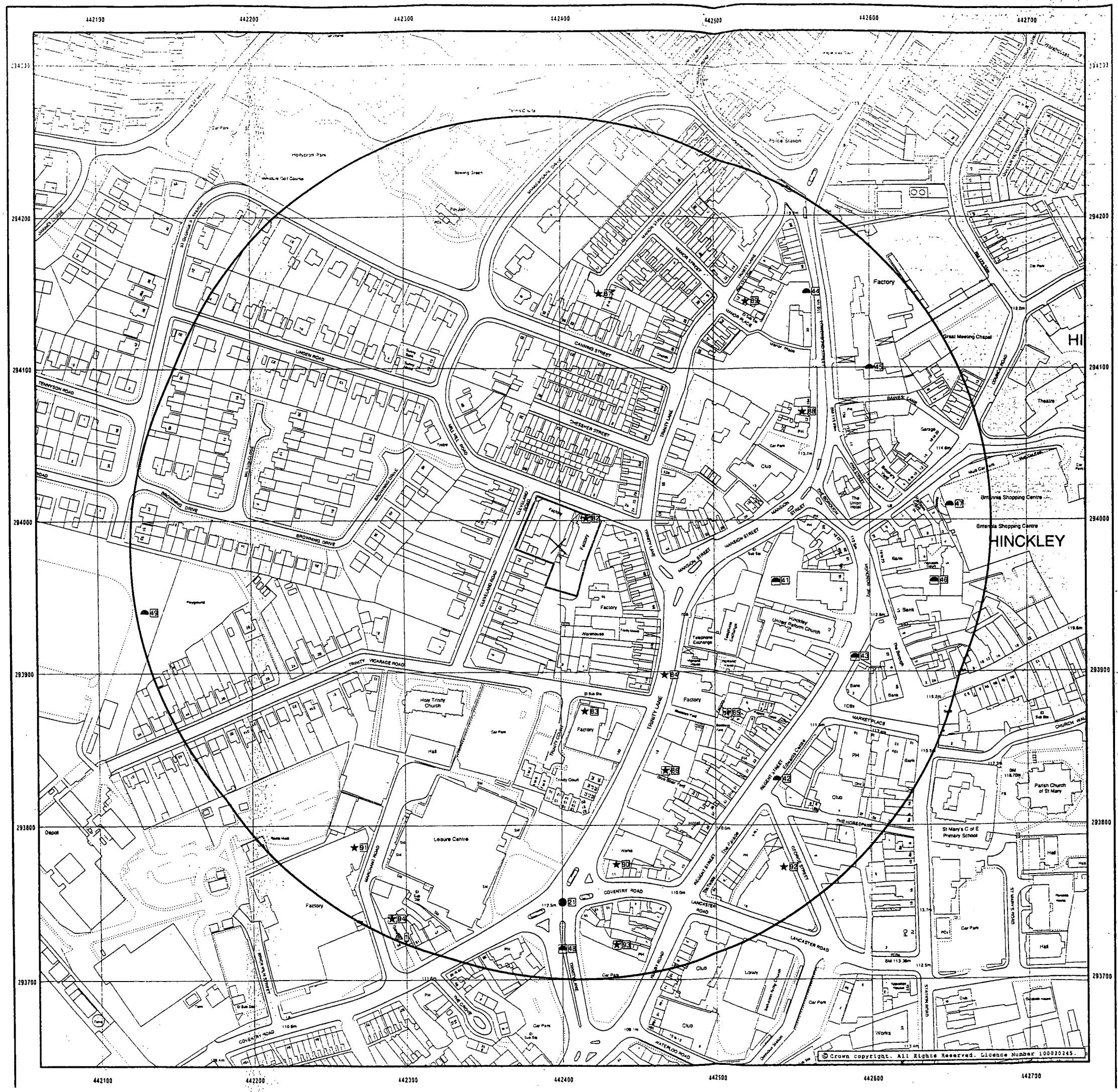
Coll
Hospl
Liby
Sta
Court
Pol Sta
Factory
Resrs
Recn Gd
Amb Sta
Lodge
Car Pk
PW



Envirocheck®

A Landmark product

CLIENT DETAILS Envirocheck Order No. EC20385785_1_1

Customer Ref: Dr B Peacock,P3779
Ground Risk Management
Bretby Business Park Ashby Road
Burton-On-Trent
Staffordshire DE15 0YZ

SITE DETAILS Grid Reference 442400 293980

Mill Hill Business Centre 5
Mill Hill Road

Hinckley
LE10 0AX

KEY TO THE LEGEND DATABASE

General

- Specified Site
- Bearing Reference Point
- Buffer (250m)
- Reference Number
- Several of Type at Location
- Pylon
- Overhead Transmission Line

Agency and Hydrological

- Local Authority Pollution Provention and Control
- Local Authority Pollution Provention and Control Enforcement
- Point Location of Contaminated Land Register Entry or Notice
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement Or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Pollution Incident to Controlled Waters
- Substantiated Pollution Incident Register
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Water Abstraction
- Water Industry Act Referral

Waste

- Point Location of BGS Recorded Landfill Site
- BGS Recorded Landfill Site
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facilities (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Point Location of Local Authority Recorded Landfill Site
- Local Authority Recorded Landfill Site
- Registered Landfill Site (Polygon)
- Point Location of Registered Landfill Site
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Point Location of Registered Waste Transfer Site
- Registered Waste Transfer Site
- Point Location of Registered Waste Treatment or Disposal Site
- Registered Waste Treatment or Disposal Site

Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

Geological

- BGS Borehole
- BGS Recorded Mineral Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

Environment Agency · British Geological Survey · Ordnance Survey Licensed Partner

Produced by Landmark Information Group Limited. Tel: 0870 850 6670 Fax: 0870 850 6671

Summary

Agency & Hydrological

Waste

Hazardous Substances

Geological

Industrial Land Use

Sensitive Land Use

Data Currency

Data Suppliers & Copyright Statements

Useful Contacts

BGS Borehole Order Form

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination. For this reason, Landmark's Site Sensitivity Datasheet places great emphasis on statutory data provided by the Environment Agency and the Scottish Environment Protection Agency; it also incorporates data from English Nature (and the Scottish and Welsh equivalents), the Environment Agency (and the Scottish equivalent) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the legend database to 1km from a single point or a site boundary provided by the client

In the attached datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers

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Data Type	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological				
Local Authority Pollution Prevention and Controls		1	4	5
Local Authority Pollution Prevention and Control Enforcements				
Contaminated Land Register Entries and Notices				
Discharge Consents			3	18
Enforcement and Prohibition Notices				
Integrated Pollution Controls			1	
Integrated Pollution Prevention And Control				
Local Authority Integrated Pollution Prevention And Control				
Nearest Surface Water Feature			Yes	
Pollution Incidents to Controlled Waters		1	2	14
Substantiated Pollution Incident Register				
Prosecutions Relating to Authorised Processes				
Prosecutions Relating to Controlled Waters				
Water Industry Act Referrals				
Registered Radioactive Substances				
River Quality				
River Quality Biology Sampling Points				
River Quality Chemistry Sampling Points				
Water Abstractions				4 (*6)
Groundwater Vulnerability	Yes			
Source Protection Zones				
Extreme Flooding from Rivers or Sea without Defences				
Flooding from Rivers or Sea without Defences				
Areas Benefiting from Flood Defences				
Flood Water Storage Areas				
Flood Defences				
River Flood Data (Scotland)				

Data Type	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste				
BGS Recorded Landfill Sites				
Integrated Pollution Control Registered Waste Sites				
Licensed Waste Management Facilities (Landfill Boundaries)				
Licensed Waste Management Facilities (Locations)				
Local Authority Recorded Landfill Sites			1	1
Registered Landfill Sites				
Registered Waste Transfer Sites				
Registered Waste Treatment or Disposal Sites				
Hazardous Substances				
Control of Major Accident Hazards Sites (COMAH)			1	
Explosive Sites				
Notification of Installations Handling Hazardous Substances (NIHHS)				
Planning Hazardous Substance Consents				
Planning Hazardous Substance Enforcements				
Geological				
BGS Boreholes		15	30	23
BGS Recorded Mineral Sites				
BGS 1:625,000 Solid Geology	Yes			
Brine Compensation Areas				
Coal Mining Affected Areas				
Shallow Mining Hazards				
Potential for Collapsible Ground Stability Hazards				
Potential for Compressible Ground Stability Hazards				
Potential for Ground Dissolution Stability Hazards				
Potential for Landslide Ground Stability Hazards	Yes			
Potential for Running Sand Ground Stability Hazards	Yes			
Potential for Shrinking or Swelling Clay Ground Stability Hazards	Yes			
Mining Instability				
Natural and Mining Cavities				
Radon Affected Areas				
Radon Protection Measures				
Industrial Land Use				
Contemporary Trade Directory Entries	4	18	36	95
Fuel Station Entries			1	3

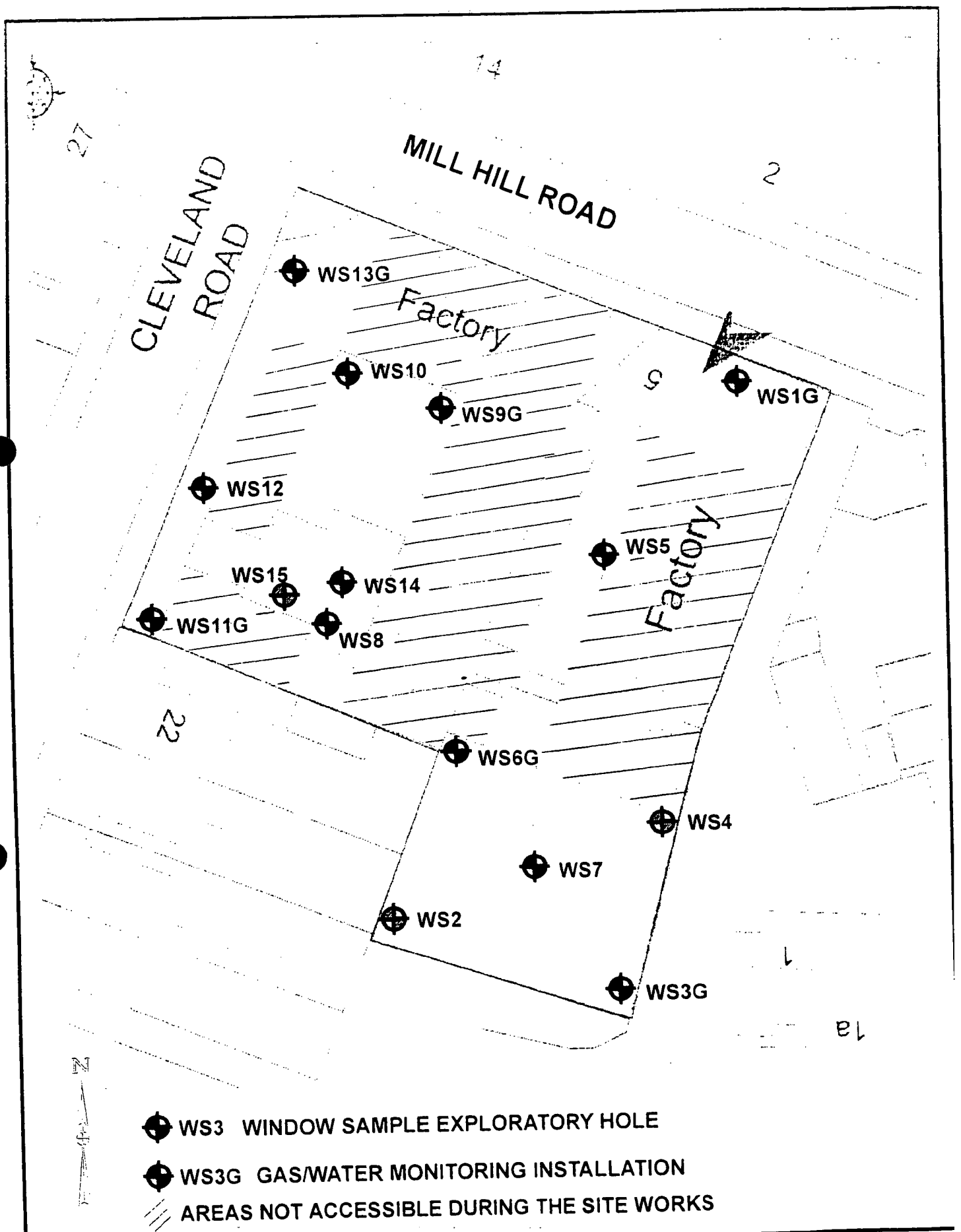
Data Type	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Sensitive Land Uses				
Areas of Adopted Green Belt				
Areas of Unadopted Green Belt				
Areas of Outstanding Natural Beauty				
Environmentally Sensitive Areas				
Forest Parks				
Local Nature Reserves				
Marine Nature Reserves				
National Nature Reserves				
National Parks				
National Scenic Areas				
Nitrate Sensitive Areas				
Nitrate Vulnerable Zones	1			
Ramsar Sites				
Sites of Special Scientific Interest				
Special Areas of Conservation				
Special Protection Areas				

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: British Waterways Board Licence Number: 03/28/19/0084 Permit Version: 100 Location: Hinckley Greyhound Track - Ashby Canal Authority: Environment Agency, Midlands Region Abstraction: Racecourses: Dust Suppression Abstraction Type: Water may be abstracted from a river or stream reach, or a row of wellpoints Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Hinckley Greyhound Track - Ashby Canal Authorised Start: 01 April Authorised End: 30 September Permit Start Date: 3rd August 1995 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	SW	1733	4	440800 293250
	Water Abstractions Operator: J Adcock & Sons Licence Number: 03/28/20/0065 Permit Version: 100 Location: Sunnyside Farm, Hinckley - Well Authority: Environment Agency, Midlands Region Abstraction: General Farming And Domestic Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Sunnyside Farm, Hinckley, Leics Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 5th August 1994 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	N	1929	4	442800 295900
	Groundwater Vulnerability Geological Classification: Non Aquifer (Negligibly permeable) - Formations which are generally regarded as containing insignificant quantities of groundwater. However, groundwater flow through such rocks, although imperceptible, does take place and needs to be considered in assessing the risk associated with persistent pollutants Soil Classification: Not classified Map Sheet: Sheet 23 Leicestershire Scale: 1:100,000	-	0	4	442400 293980
	Drift Deposits Description None	-	-	-	-
	Extreme Flooding from Rivers or Sea without Defences Description None	-	-	-	-
	Flooding from Rivers or Sea without Defences Description None	-	-	-	-
	Areas Benefiting from Flood Defences Description None	-	-	-	-
	Flood Water Storage Areas Description None	-	-	-	-
	Flood Defences Description None	-	-	-	-
	River Flood Data (Scotland) Description None	-	-	-	-

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	NW	101	7	442300 294070
	Radon Affected Areas Description: Less than 1% of homes are above the Action Level Source: Health Protection Agency	-	0	8	442400 293980
	Radon Affected Areas Description: Less than 1% of homes are above the Action Level Source: Health Protection Agency	N	0	8	442400 294000
	Radon Protection Measures Type: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	-	0	7	442400 293980

APPENDIX E

GRM Development Solutions
geoenvironmental - civil - structural



Exploratory Hole Location Plan of Site at
Mill Hill Road, Hinckley.
Scale: NTS. Project ref GRM/P3779

APPENDIX F

GRM Development Solutions
geoenvironmental - civil - structural

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Burton-on-Trent (HQ) Tel: 01283 551249
Market Harborough Tel: 01858 414931
Email: mail@grm-uk.com Web: www.grm-uk.com

Window Sample Log

Borehole Number: **WS1**

Site: Mill Hill Road. Hinckley

Project Reference: P3779

Sheet 1 of 1

Client: David Wilson Homes East Midlands

Equipment & Methods: Tracked window sampler rig.

Scale: 1:50

Depth	Samples	Legend	Description	Dynamic Probe (N100)/SPT(N)	Groundwater/ Installations	Level mAOD	Depth
0						0	0
	D1 0.30		0.08 Engineer bricks (laid as a floor).(MADE GROUND)				
	D2 0.70		0.55 Orange brown sandy silty locally very sandy clay with occasional fine to coarse angular to subangular gravel of flint and brick.(MADE GROUND)			-1	1
1	D3 1.70-1.80		1.50 Medium dense orange brown red brown locally slightly clayey fine and medium sand with occasional fine to coarse subangular to rounded gravel of quartzite and carbonaceous material.(MADE GROUND)			-2	2
2			Medium dense orange brown becoming slightly clayey at 2.3m fine and medium SAND.(GLACIAL SAND AND GRAVEL)				
	D4 2.70-2.90		2.50 Soft brown slightly sandy silty CLAY with occasional fine to coarse angular to rounded gravel of flint, quartzite and carbonaceous material. Locally small pockets of sand.(GLACIAL TILL)			-3	3
3	D5 3.70-3.90		3.70 Medium dense orange brown fine and medium				
	D6 3.90-4.00		3.90 SAND.(GLACIAL SAND AND GRAVEL)			-4	4
4			4.00 Firm orange brown slighty clayey SILT.(GLACIAL SAND AND GRAVEL)				
			End of Borehole at 4.00 m				
5						-5	5
6						-6	6
7						-7	7
8							8

Soil Gases				Logged by: SW	Date Started: 20/09/2006	Ground Level (mAOD) 0.000
Barometric Pressure (mbar)	-	Carbon dioxide %vol	-	Crew: PSD	Date Finished: 20/09/2006	Easting: -
Oxygen %vol	-	Methane %vol	-			Northing: -

Hole Remarks: Exploratory hole inside cellar (appx 2.2m below pavement level).

Groundwater Remarks: No groundwater observed.

All depths/levels are in metres.

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Window Sample Log

Borehole Number: **WS2**

Site: Mill Hill Road, Hinckley

Project Reference: P3779

Sheet 1 of 1

Client: David Wilson Homes East Midlands

Equipment & Methods: Tracked window sampler.

Scale: 1:50

Strata Record

Depth	Samples	Legend	Description
0.00			
	D1 0.30-0.40		0.05 Tarmacadam.(MADE GROUND)
			Firm brown orange brown slightly sandy silty clay with occasional fine to coarse angular to rounded gravel of quartzite, carbonaceous material, coal and fragments of brick.(MADE GROUND)
	D2 0.80-0.90		0.60
1			Firm orange brown yellow brown becoming red brown slightly sandy silty clay with occasional locally some fine to coarse angular to rounded gravel of sandstone, quartzite, glass, slate and brick.(MADE GROUND)
	D3 1.70-1.90		1.70
2			1.90 Loose red brown locally slightly clayey fine to coarse sand with occasional fine to coarse angular gravel of brick and sandstone.(MADE GROUND)
	D4 2.80-3.00		Firm brown red brown slightly sandy silty locally sandy clay with occasional fine to coarse angular to rounded gravel of quartzite, brick and coal.(MADE GROUND)
3			
	D5 3.80-4.00		3.80
4			Firm brown grey brown slightly sandy silty CLAY with occasional fine to coarse angular to rounded gravel of quartzite, sandstone, chalk, black mudstone and siltstone.(GLACIAL SAND AND GRAVEL)
	D6 4.70-5.00		4.70
5			Firm brown orange brown slightly sandy locally sandy CLAY with occasional soft carbonaceous material. Locally small bands of sand,(GLACIAL TILL)
	D7 5.70-6.00		
6			
	D8 6.60-7.00		6.60
7			Medium dense orange brown becoming slightly silty at 6.8m coarse becoming fine at 6.8m SAND with occasional fine and medium angular gravel of carbonaceous material and coal.(GLACIAL SAND AND GRAVEL)
			7.00 End of Borehole at 7.00 m
8			

Dynamic Probe (N100)/SPT(N)

Depth	N100	SPT(N)
0	0 5 10 15 20 25	0 10 20 30 40 50
1	5	
2	5	
3	5	
4	7	
5	7	
6	9	
7	28	

Groundwater/ Installations

Level mAOD: 0, -1, -2, -3, -4, -5, -6, -7

Depth: 0, 1, 2, 3, 4, 5, 6, 7, 8

Soil Gases

Barometric Pressure (mbar)	-	Carbon dioxide %vol	-
Oxygen %vol	-	Methane %vol	-

Logged by: SW

Crew: PSD

Date Started: 20/09/2006

Date Finished: 20/09/2006

Ground Level (mAOD): 0.000

Easting: -

Northing: -

Hole Remarks:

Groundwater Remarks: No groundwater observed.

All depths/levels are in metres.

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Window Sample Log

Borehole Number: WS3

Site: Mill Hill Road, Hinckley

Project Reference: P3779

Sheet 1 of 1

Client: David Wilson Homes East Midlands

Equipment & Methods: Tracked window sampler rig.

Scale: 1:50

Depth	Samples	Legend	Description	Dynamic Probe (N100)/SPT(N)	Groundwater/ Installations	Level mAOD	Depth
0			0.08 Tarmacadam.(MADE GROUND)			0	0
	D1 0.40		0.30 Dark red brown silty sandy fine to coarse angular gravel of siltstone, ash, brick and concrete.(MADE GROUND)				
1	D2 0.95-1.00		0.90 Soft dark grey mottled grey brown silty sandy clay with occasional gravel of ash,	6		-1	1
	D3 1.20-1.30		1.10 brick and coal. (MADE GROUND)				
			1.60 Firm brown orange brown mottled grey slightly silty clay with occasional fine to coarse angular gravel of coal.(MADE GROUND)				
2			Loose silty sand with occasional fine to coarse angular gravel of brick and pottery.(MADE GROUND)	5		-2	2
	D4 2.50-2.60						
	D5 2.90-3.00		2.80 Loose orange brown silty locally clayey fine and medium SAND. Locally small pockets of clay.(GLACIAL SAND AND GRAVEL)	12		-3	3
			Medium dense orange brown very silty fine SAND.(GLACIAL SAND AND GRAVEL)				
	D6 3.80-3.90						
4			4.00 End of Borehole at 4.00 m	17		-4	4
5						-5	5
6						-6	6
7						-7	7
8							8

Strata Record

Soil Gases				Logged by: BO	Date Started: 20/09/2006	Ground Level (mAOD) 0.000
Barometric Pressure (mbar)	-	Carbon dioxide %vol	-	Crew: PSD	Date Finished: 20/09/2006	Easting: -
Oxygen %vol	-	Methane %vol	-			Northing: -

Hole Remarks:

Groundwater Remarks: No groundwater observed.

All depths/levels are in metres.

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Window Sample Log

Borehole Number: **WS4**

Site: Mill Hill Road, Hinckley

Project Reference: P3779

Sheet 1 of 1

Client: David Wilson Homes East Midlands

Equipment & Methods: Tracked window sampler rig.

Scale: 1:50

Strata Record

Depth	Samples	Legend	Description
0.07	D1 0.10-0.20		Tarmacadam.(MADE GROUND)
			Firm brown green grey brown slightly sandy silty clay with occasional locally some fine to coarse angular to rounded gravel of coal, quartzite, clinker and brick.(MADE GROUND)
1.40	D2 1.60-1.80		Firm orange brown slightly sandy locally sandy silty CLAY with occasional fine and medium subangular gravel of carbonaceous material and sandstone.(GLACIAL TILL)
2.60	D3 2.70-2.90		Loose becoming medium dense at 3.0m orange brown fine to coarse SAND with occasional locally some fine to coarse angular to rounded gravel of quartzite, flint and sandstone. Locally small bands (<50mm) of silt and clay.(GLACIAL TILL)
3.50	D4 3.50-3.80		Stiff orange brown slightly sandy very silty CLAY with occasional fine and medium subangular gravel of carbonaceous material and coal.(GLACIAL TILL)
3.90 / 4.00			Medium dense orange brown red brown fine and medium SAND.(GLACIAL TILL)
			End of Borehole at 4.00 m

Dynamic Probe (N100)/SPT(N)

Depth	N100	SPT(N)
1	5	
2	5	
3	17	
4	22	

Groundwater/ Installations

Level mAOD

Soil Gases			
Barometric Pressure (mbar)	-	Carbon dioxide %vol	-
Oxygen %vol	-	Methane %vol	-

Logged by: SW

Crew: PSD

Date Started: 20/09/2006

Date Finished: 20/09/2006

Ground Level (mAOD): 0.000

Easting: -

Northing: -

Hole Remarks:

Groundwater Remarks: No groundwater observed.

All depths/levels are in metres.

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Window Sample Log

Borehole Number: WS5

Site: Mill Hill Road, Hinckley

Project Reference: P3779

Sheet 1 of 1

Client: David Wilson Homes East Midlands

Equipment & Methods: Tracked window sampler rig

Scale: 1:50

Strata Record

Depth	Samples	Legend	Description
0.05			Tarmacadam.(MADE GROUND)
0.16			Concrete.(MADE GROUND)
	D1 0.60-0.80		Firm green grey brown orange brown slightly sandy silty locally sandy clay with occasional fine to coarse angular to rounded gravel of quartzite, brick, carbonaceous material, coal and sandstone.(MADE GROUND)
	D2 1.70-1.80		
2.00			Soft to firm becoming firm at 3.0m orange brown slightly silty sandy CLAY with rare fine and medium rounded gravel of quartzite.(GLACIAL TILL)
	D3 2.85-2.95		
3.70	D4 3.70-4.00		Firm becoming soft at 4.0m green brown orange brown slightly sandy silty CLAY with occasional fine to coarse angular to rounded gravel of sandstone, carbonaceous material and quartzite.(GLACIAL TILL)
4.50	D5 4.60-5.00		Loose orange brown slightly silty locally clayey fine SAND. Locally small pockets of clay.(GLACIAL SAND AND GRAVEL)
5.70	D6 5.80-6.00		Firm becoming stiff at 6.5m dark green brown orange brown slightly sandy silty locally sandy CLAY with occasional fine to coarse subangular to rounded gravel of quartzite, sandstone and carbonaceous material.(GLACIAL TILL)
6.00			End of Borehole at 6.00 m

Dynamic Probe (N100)/SPT(N)

Depth	N100	SPT(N)
1	4	4
2	5	5
3	3	3
4	4	4
5	10	10
6	26	26

Groundwater/ Installations

Level mAOD: 0, -1, -2, -3, -4, -5, -6, -7

Depth: 0, 1, 2, 3, 4, 5, 6, 7, 8

Soil Gases				Logged by: SW	Date Started: 20/09/2006	Ground Level (mAOD) 0.000
Barometric Pressure (mbar)	-	Carbon dioxide %vol	-	Crew: PSD	Date Finished: 20/09/2006	Easting: -
Oxygen %vol	-	Methane %vol	-			Northing: -

Hole Remarks:

Groundwater Remarks: No groundwater observed.

All depths/levels are in metres.

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Window Sample Log

Borehole Number: WS6

Site: Mill Hill Road, Hinckley

Project Reference: P3779

Sheet 1 of 1

Client: David Wilson Homes East Midlands

Equipment & Methods: Tracked window sampler rig.

Scale: 1:50

Depth	Samples	Strata Record: Legend	Description
0			Concrete.(MADE GROUND)
0.23	D1 0.50-0.60		Stiff locally firm brown grey brown mottled grey silty slightly sandy clay with occasional fine to coarse subangular to rounded gravel of quartzite, mudstone, carbonaceous material with rare fragments of brick. (MADE GROUND)
1.30	D2 1.70-1.80		Firm brown grey brown silty sandy clay with occasional fine to coarse subangular to rounded gravel of quartzite and abundant brick fragments.(MADE GROUND)
2.50	D3 2.70-2.80		Firm orange brown slightly silty slightly sandy clay with rare brick fragments.(MADE GROUND)
3.50	D4 3.70-3.80		Firm brown grey brown sandy slightly organic clay with occasional fine to coarse angular to rounded gravel of quartzite and fragments of brick. (MADE GROUND)
4.50	D5 4.80-5.00		Orange brown clayey SILT.(GLACIAL TILL)
5.50	D6 5.50-5.80		Firm brown grey brown mottled orange brown sandy CLAY.(GLACIAL TILL)
6.00			End of Borehole at 6.00 m

Dynamic Probe (N100)/SPT(N): N100 0 5 10 15 20 25; SPT(N) 0 10 20 30 40 50

Groundwater/ Installations

Level mAOD: 0 -1 -2 -3 -4 -5 -6 -7

Depth: 0 1 2 3 4 5 6 7 8

Soil Gases				Logged by: BO	Date Started: 20/09/2006	Ground Level (mAOD) 0.000
Barometric Pressure (mbar)	-	Carbon dioxide %vol	-	Crew: PSD	Date Finished: 20/09/2006	Easting: -
Oxygen %vol	-	Methane %vol	-			Northing: -

Hole Remarks:

Groundwater Remarks: Seepage at 3.5m

Version:

All depths/levels are in metres.

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Window Sample Log

Borehole Number: WS7

Site: Mill Hill Road, Hinckley

Project Reference: P3779

Sheet 1 of 1

Client: David Wilson Homes East Midlands

Equipment & Methods: Tracked window sampler rig.

Scale: 1:50

Depth	Samples	Legend	Description	Dynamic Probe (N:30)/SPT(N)	Groundwater/ installations	Level mAOD	Depth
0			0.05 Tarmacadam.(MADE GROUND)			0	0
	D1 0.20-0.40		0.10				
	D2 0.40-0.60		0.40 Firm green brown slightly sandy silty clay with occasional fine to coarse angular to subangular gravel of brick, coal and sandstone.(MADE GROUND)				
	D3 0.70-0.80		0.70 Loose black sandy fine to coarse angular to subangular gravel of coal, ash, clinker and glass.(MADE GROUND)			-1	1
1							
	D4 1.50-1.70		Firm dark green brown slightly sandy silty locally sandy clay with occasional fine to coarse angular to subangular gravel of coal, carbonaceous material and fragments of brick. (Slight organic odour).(MADE GROUND)			-2	2
2							
			Firm locally soft orange brown locally brown green brown slightly sandy silty locally sandy clay with occasional fine to coarse angular to subangular gravel of siltstone, sandstone, carbonaceous material and fragments of brick.(MADE GROUND)			-3	3
3							
	D5 3.70-4.00		3.70 Soft to firm orange brown silty slightly sandy CLAY with occasional fine and medium subangular gravel of sandstone, carbonaceous material and coal. Band of silt at 4.7m to 4.8m.(GLACIAL TILL)			-4	4
4							
	D6 4.30-4.70						
5			5.00 End of Borehole at 5.00 m			-5	5
6						-6	6
7						-7	7
8							8

Soil Gases

Barometric Pressure (mbar)	-	Carbon dioxide %vol	-
Oxygen %vol	-	Methane %vol	-

Logged by: SW

Crew: PSD

Date Started: 20/09/2006

Date Finished: 20/09/2006

Ground Level (mAOD) 0.000

Easting: -

Northing: -

Hole Remarks:

Groundwater Remarks: No groundwater observed.

All depths/levels are in metres.

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Window Sample Log

Borehole Number: WS8

Site: Mill Hill Road, Hinckley

Project Reference: P3779

Sheet 1 of 1

Client: David Wilson Homes East Midlands

Equipment & Methods: Tracked window sampler rig

Scale: 1:50

Depth	Samples	Legend	Description	Dynamic Probe (N:30)/SPT(N)	Groundwater/ Installations	Level mAOD	Depth
0						0	0
	D1 0.19-0.35		0.12 Concrete.(MADE GROUND)				
	D2 0.40-0.60		0.19 Brick course.(MADE GROUND) 0.35 Loose black sandy fine to coarse angular to subangular gravel of ash, clinker and fragments of brick. (Strong odour of hydrocarbons).(MADE GROUND)	6		-1	1
1			1.20 Firm dark grey dark green brown locally black becoming orange brown at 0.8m slightly sandy silty clay with occasional fine to coarse angular to rounded gravel of quartzite, clinker and fragments of brick. (Moderate odour of hydrocarbons).(MADE GROUND)	13		-2	2
2	D3 1.70-1.80						
	D4 2.60-2.80		2.50 Firm becoming stiff at 2.0m green brown orange brown slightly sandy silty CLAY with occasional fine and medium subangular to subrounded gravel of siltstone, carbonaceous material and chalk. (Slight odour of hydrocarbons).(GLACIAL TILL)	4		-3	3
3	D5 3.20-3.60		3.20				
	D6 3.60-3.90		3.60 Stiff becoming soft at 3.0m dark orange brown locally dark grey staining sandy locally very sandy CLAY with occasional fine and medium subangular gravel of coal and carbonaceous material. (Strong odour of hydrocarbons).(GLACIAL TILL)	8		-4	4
4			4.40 Soft to firm sandy silty CLAY with much fine to coarse angular to rounded gravel of quartzite, siltstone, sandstone and carbonaceous material. (Slight odour of hydrocarbons).(GLACIAL TILL)				
	D7 4.70-5.00		5.00 Very loose to loose becoming loose at 4.0m orange brown very clayey fine and medium SAND. Occasional pockets of clay and silt. (Very slight odour of hydrocarbons). (GLACIAL SAND AND GRAVEL)	21		-5	5
5			Loose becoming medium dense at 5.0m orange brown fine and medium SAND. (Very slight odour of hydrocarbons).(GLACIAL SAND AND GRAVEL)				
6			End of Borehole at 5.00 m			-6	6
7						-7	7
8							8

Soil Gases				Logged by: SW	Date Started: 21/09/2006	Ground Level (mAOD)
Barometric Pressure (mbar)	-	Carbon dioxide %vol	-	Crew: PSD	Date Finished: 21/09/2006	0.000
Oxygen %vol	-	Methane %vol	-			Easting: -
						Northing: -

Hole Remarks: Olfactory evidence of hydrocarbons from 0.19m to 5.0m

Groundwater Remarks: No groundwater obserbved.

All depths/levels are in metres.

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Window Sample Log

Borehole Number: WS9

Site: Mill Hill Road, Hinckley

Project Reference: P3779

Sheet 1 of 1

Client: David Wilson Homes East Midlands

Equipment & Methods: Tracked window sampler rig.

Scale: 1:50

Depth	Samples	Legend	Description
	D1 0.15-0.25 D2 0.25-0.45		0.15 Concrete.(MADE GROUND)
	D3 0.60-0.80		0.25 Loose black sandy fine to coarse angular to subangular gravel of ash, clinker and 0.55 fragments of brick.(MADE GROUND)
	D4 1.30-1.80		1.10 Firm locally soft brown dark green brown locally orange brown slightly silty sandy clay with occasional fine to coarse angular to rounded gravel of quartzite, flint, carbonaceous amterial and fragments of brick.(MADE GROUND)
			Firm orange brown slightly silty CLAY with rare fine and medium angular to subangular gravel of chalk and carbonaceous material.(GLACIAL TILL)
	D5 2.70-3.00		2.70 Stiff becoming firm at 2.0m orange brown red brown sandy slightly silty locally very silty at 2.3m CLAY with rare carbonaceous material.(GLACIAL TILL)
	D6 3.60-3.75 D7 3.75-4.00		3.60 Medium dense orange brown slightly silty locally slightly clayey fine and medium 3.75 SAND with occasional fine and medium subangular gravel of sandstone.(GLACIAL SAND AND GRAVEL)
			4.00 Firm orange brown slightly silty slightly clayey SILT.(GLACIAL SAND AND GRAVEL)
			Medium dense orange brown fine and medium SAND.(GLACIAL SAND AND GRAVEL)
			End of Borehole at 4.00 m

Dynamic Probe (N100)/SPT(N)

N100: 3 5 10 15 20 25
SPT(N): 2 10 20 30 40 50

12 → 110kN/m²
8 →
14 →
26 →

Groundwater/ Installations

Level mAOD: 0 -1 -2 -3 -4 -5 -6 -7

Depth: 0 1 2 3 4 5 6 7 8

Soil Gases				Logged by: SW	Date Started: 21/09/2006	Ground Level (mAOD)
Barometric Pressure (mbar)	-	Carbon dioxide %vol	-	Crew: PSD	Date Finisned: 21/09/2006	0.000
Oxygen %vol	-	Methane %vol	-			Easting: -
						Northing:-

Hole Remarks:

Groundwater Remarks: No groundwater observed.

All depths/levels are in metres.

Version:

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Window Sample Log

Borehole Number: WS10

Site: Mill Hill Road, Hinckley

Project Reference: P3779

Sheet 1 of 1

Client: David Wilson Homes East Midlands

Equipment & Methods: Tracked window sampler rig.

Scale: 1:50

Depth	Samples	Legend	Description
0			
	D1 0.18-0.35		0.08 Concrete.(MADE GROUND)
	D2 0.35-0.50		0.18
	D3 0.60-0.70		0.35 Brick course.(MADE GROUND)
			0.60 Loose black sandy fine to coarse angular to subangular gravel of ash, clinker and fragments of brick.(MADE GROUND)
1			
	D4 1.40-1.60		1.30 Firm to stiff dark green brown slightly sandy silty clay with occasional fine to coarse angular to rounded gravel of quartzite, brick, clinker and carbonaceous material.(MADE GROUND)
2			
	D5 2.20-2.40		Firm to stiff orange brown red brown slightly sandy silty CLAY with occasional fine and medium subangular to subrounded gravel of carbonaceous material and ironstone nodules.(GLACIAL TILL)
	D6 2.70-2.90		2.70
3			Firm locally soft becoming soft at 2.2m orange brown red brown sandy locally silty CLAY with rare subangular gravel of sandstone and carbonaceous material. Locally small pockets of sand.(GLACIAL
	D7 3.60-3.75		3.60 TILL)
			3.75 Medium dense orange brown fine and medium
4			3.95 SAND.(GLACIAL SAND AND GRAVEL)
			4.00 Firm orange brown slightly sandy SILT.(GLACIAL SAND AND GRAVEL)
5			Medium dense orange brown red brown fine and medium SAND.(GLACIAL SAND AND GRAVEL)
			Firm orange brown slightly sandy SILT.(GLACIAL SAND AND GRAVEL)
6			End of Borehole at 4.00 m
7			
8			

Dynamic Probe (N100)/SPT(N)

N100 SPT(N) 0 5 10 15 20 25

N 0 10 20 30 40 50

130kN/m²

Groundwater/ Installations

Level mAOD: 0 -1 -2 -3 -4 -5 -6 -7

Depth: 0 1 2 3 4 5 6 7 8

Soil Gases				Logged by: SW	Date Started: 21/09/2006	Ground Level (mAOD)
Barometric Pressure (mbar)	-	Carbon dioxide %vol	-	Crew: PSD	Date Finished: 21/09/2006	0.000
Oxygen %vol	-	Methane %vol	-			Easting: -
						Northing: -

Hole Remarks:

Groundwater Remarks: No groundwater observed.

All depths/levels are in metres.

Version:

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Window Sample Log

Borehole Number: WS11

Site: Mill Hill Road, Hinckley

Project Reference: P3779

Sheet 1 of 1

Client: David Wilson Homes East Midlands

Equipment & Methods: Tracked window sampler

Scale: 1:50

Depth	Samples	Legend	Description	Dynamic Probe (N100)/SPT(N)	Groundwater/ Installations	Level mAOD	Depth
0	D1 0.10-0.20 D2 0.20-0.40		0.08 Concrete.(MADE GROUND) 0.20			0	0
	D3 0.60-0.70		0.40 Loose black slightly sandy silty clay with angular to subangular gravel of ash and clinker.(MADE GROUND)				
1	D4 0.95-1.25		0.90 Firm brown orange brown slightly sandy silty clay with occasional fine to coarse angular to rounded gravel of quartzite, brick, clinker, sandstone and carbonaceous material.(MADE GROUND)	16		-1	1
2	D5 2.20-2.40		2.00 Firm to stiff orange brown red brown slightly sandy silty CLAY with occasional fine and medium subangular to rounded gravel of quartzite, chalk, sandstone and carbonaceous material.(GLACIAL TILL) 2.40	16		-2	2
3	D6 2.60-3.00		Stiff green brown mottled grey slightly sandy silty locally sandy CLAY with occasional fine to caorse angular to rounded gravel of quartzite, siltstone and carbonaceous material.(GLACIAL TILL)	5		-3	3
4	D7 3.65-3.85		4.00 Stiff red brown slightly sandy silty locally sandy CLAY with occasional fine to coarse angular to rounded gravel of quartzite, siltstone and carbonaceous material.(GLACIAL TILL)	18		-4	4
5			Loose becoming medium dense at 4.0m orange brown locally slightly silty locally slightly clayey fine and medium SAND with occasional fine to coarse angular to rounded gravel of quartzte and carbonaceous material. Locally thin bands of clay <20mm.(GLACIAL SAND AND GRAVEL)			-5	5
6			End of Borehole at 4.00 m			-6	6
7						-7	7
8							8

Soil Gases

Barometric Pressure (mbar)	-	Carbon dioxide %vol	-
Oxygen %vol	-	Methane %vol	-

Logged by: SW

Crew: PSD

Date Started: 21/09/2006

Date Finished: 21/09/2006

Ground Level (mAOD): 0.000

Easting: -

Northing: -

Hole Remarks:

Groundwater Remarks: No groundwater observed.

All depths/levels are in metres.

Version:

GRM Development Solutions
Burton-on-Trent (HQ) Tel: 01283 551249
Market Harborough Tel: 01858 41 4331
Email: ma@grmuk.com Web: www.grmuk.com

Window Sample Log

Borehole Number: WS12

Site: Mill Hill Road, Hinckley

Project Reference: P3779

Sheet 1 of 1

Client: David Wilson Homes East Midlands

Equipment & Methods: Tracked window sampler rig

Scale: 1:50

Depth	Samples	Legend	Strata Record Description	Dynamic Probe (N100)/SPT(N)	Groundwater/ Installations	Level mAOD	Depth
0	D1 0.14-0.30 D2 0.30-0.40 D3 0.50-0.60		0.06 Concrete.(MADE GROUND) 0.14 0.30 Brick course.(MADE GROUND) 0.40 Loose black sandy fine to coarse angular to subangular gravel of ash, clinker, brick and concrete.(MADE GROUND) Firm green brown slightly sandy locally sandy clay with occasional fine to coarse angular to subrounded gravel of quartzite, brick, and carbonaceous material.(MADE GROUND)	N100 0 5 10 15 20 25 SPT(N) 0 10 20 30 40 50		0	0
1						-1	1
2	D4 2.25-2.45		2.25 Firm to stiff orange brown mottled grey slightly sandy CLAY with occasional fine to coarse subangular to subrounded gravel of quartzite, sandstone, chalk, and flint.(GLACIAL TILL)			-2	2
3	D5 2.75-2.85		2.75 Firm orange brown sandy slightly silty CLAY. Locally thin bands of sand.(GLACIAL TILL)			-3	3
4			4.00 Loose becoming medium dense at 4.0m orange brown orange brown red brown locally slightly silty slightly clayey fine and medium SAND. Locally thin bands of clay and silt.(GLACIAL SAND AND GRAVEL) End of Borehole at 4.00 m			-4	4
5						-5	5
6						-6	6
7						-7	7
8							8

Soil Gases

Barometric Pressure (mbar)	-	Carbon dioxide %vol	-
Oxygen %vol	-	Methane %vol	-

Logged by: SW

Crew: PSD

Date Started: 21/06/2009

Date Finished: 21/06/2009

Ground Level (mAOD): 0.000

Easting: -

Northing: -

Hole Remarks:

Groundwater Remarks: No groundwater observed.

All depths/levels are in metres.

Version:

GRM Development Solutions

Burton-on-Trent (HQ) Tel: 01283 551249
Market Harborough Tel: 01858 414981
Email: mail@grm-uk.com Web: www.grm-uk.com

Window Sample Log

Borehole Number: **WS13**

Site: Mill Hill Road, Hinckley

Project Reference: P3779

Sheet 1 of 1

Client: David Wilson Homes East Midlands

Equipment & Methods: Tracked window sampler rig.

Scale: 1:50

Strata Record

Depth	Samples	Description
0.08	D1 0.08-1.50	Concrete.(MADE GROUND)
1.50	D2 1.50-1.90	Loose dark brown sadny fine to coarse angular to subangular gravel of ash, clinker and cobbles of full brick. (Small cavities upto 100mm within 1st metre).(MADE GROUND)
1.90	D3 2.60-2.80	Firm orange brown dark brown slightly sandy silty clay with occasional locally some fine to coarse angular to subangular gravel of quartzite, brick and clinker.(MADE GROUND)
2.60	D4 3.10-3.40	Stiff orange brown slightly sandy silty CLAY with occasional fine to coarse subangular to rounded gravel of quartzite, chalk and carbonaceous material.(GLACIAL TILL)
3.50	D5 3.60-3.80	Firm locally soft orange brown sandy silty locally very sandy CLAY with rare fine and medium subangular gravel of flint and carbonaceous material. Locally small bands of sand 2.9m to 3.0m.(GLACIAL TILL)
3.90		Loose becoming medium dense orange brown very silty fine SAND.(GLACIAL SAND AND GRAVEL)
4.00		Medium dense orange brown red brown fine and medium SAND.(GLACIAL SAND AND GRAVEL)

End of Borehole at 4.00 m

Dynamic Probe (N100)/SPT(N): 13 — 130 kN

Groundwater/Installations

Level mAOD

Depth: 0, 1, 2, 3, 4, 5, 6, 7, 8

Foundwidth 65kN/m². at least 35kN/m² from firm locally soft ok

Soil Gases				Logged by: SW	Date Started: 21/09/2006	Ground Level (mAOD) 0.000
Barometric Pressure (mbar)	-	Carbon dioxide %vol	-	Crew: PSD	Date Finished: 21/09/2006	Easting: -
Oxygen %vol	-	Methane %vol	-			Northing: -

Hole Remarks: Hole collapsing to 1.9m.

Groundwater Remarks: No groundwater observed.

All depths/levels are in metres.

Version:

GRM Development Solutions
Burton-on-Trent (HQ) Tel: 01283 551249
Market Harborough Tel: 01858 414931
Email: mail@grm-uk.com Web: www.grm-uk.com

Window Sample Log

Borehole Number: WS14

Site: Mill Hill Road, Hinckley

Project Reference: P3779

Sheet 1 of 1

Client: David Wilson Homes East Midlands

Equipment & Methods: Tracked window sampler rig.

Scale: 1:50

Strata Record

Depth	Samples	Legend	Description	Dynamic Probe (N100)/SPT(N)	Groundwater/ Installations	Level mAOD	Depth
0	D1 0.12-0.30		0.12 Concrete.(MADE GROUND)			0	0
	D2 0.60-0.70		0.30 Loose black sandy fine to coarse angular to subangular gravel of clinker, ash and brick.(MADE GROUND)				
1			0.90 Firm brown orange brown green brown slightly sandy silty clay with occasional fine to coarse angular to rounded gravel of quartzite, flint, chalk, carbonaceous material and brick.(MADE GROUND)			-1	1
2	D3 1.70-1.90		2.10 Soft orange brown slightly sandy locally sandy CLAY with occasional fine to coarse subangular to rounded gravel of quartzite, flint and chalk.(GLACIAL TILL)			-2	2
3	D4 2.60-2.80		3.00 Firm locally soft red brown orange brown sandy locally very sandy CLAY with occasional fine and medium angular to subangular gravel of siltstone and carbonaceous material.(GLACIAL TILL)			-3	3
4			End of Borehole at 3.00 m			-4	4
5						-5	5
6						-6	6
7						-7	7
8							8

Soil Gases				Logged by: SW	Date Started: 21/09/2006	Ground Level (mAOD) 0.000
Barometric Pressure (mbar)	-	Carbon dioxide %vol	-	Crew: PSD	Date Finished: 21/09/2006	Easting: -
Oxygen %vol	-	Methane %vol	-			Northing: -

Hole Remarks: No olfactory evidence of hydrocarbons at any depth.

Groundwater Remarks: No groundwater observed.

All depths/levels are in metres.

Version:

GRM Development Solutions
Burton-on-Trent (HQ) Tel: 01283 551249
Market Harborough Tel: 01858 414981
Email: ma...@grm-uk.com Web: www.grm-uk.com

Window Sample Log

Borehole Number: **WS15**

Site: Mill Hill Road, Hinckley

Project Reference: P3779

Sheet 1 of 1

Client: David Wilson Homes East Midlands

Equipment & Methods: Tracked window sampler rig.

Scale: 1:50

Strata Record

Depth	Samples	Legend	Description
0.00			
	D1 0.20-0.35		0.10 Concrete.(MADE GROUND)
			0.20 Brick course.(MADE GROUND)
	D2 0.70-0.90		0.35 Loose black sandy fine to coarse angular to subangular gravel of ash, clinker and fragments of brick.(MADE GROUND)
			0.90 Firm dark brown dark grey orange brown slightly sandy silty locally sandy clay with occasional fine to coarse angular to rounded gravel of carbonaceous material, quartzite and fragments of brick.(MADE GROUND)
	D3 1.50-1.60		
			2.10 Stiff green brown mottled orange brown slightly sandy silty CLAY with occasional fine to coarse angular to subrounded gravel of flint, chalk and carbonaceous material.(GLACIAL TILL)
	D4 2.70-3.00		2.30
			3.00 Stiff red brown slightly sandy silty CLAY with occasional fine to coarse angular to rounded gravel of quartzite.(GLACIAL TILL)
			Soft red brown orange brown sandy silty locally very sandy CLAY with occasional carbonaceous material. Locally thin bands of sand.(GLACIAL TILL)
			End of Borehole at 3.00 m

Dynamic Probe (N100)/SPT(N)

N100 / SPT(N): 0 5 10 15 20 25 / 0 10 20 30 40 50

Groundwater/ Installations

Level mAOD: 0 -1 -2 -3 -4 -5 -6 -7

Depth: 0 1 2 3 4 5 6 7 8

Soil Gases				Logged by: SW	Date Started: 21/09/2006	Ground Level (mAOD)
Barometric Pressure (mbar)	-	Carbon dioxide %vol	-	Crew: PSD	Date Finished: 21/09/2006	0.000
Oxygen %vol	-	Methane %vol	-			Easting: -
						Northing: -

Hole Remarks: No olfactory evidence of hydrocarbons at any depth.

Groundwater Remarks: No groundwater observed.

All depths/levels are in metres.

Version:

APPENDIX G

GRM Development Solutions
geoenvironmental - civil - structural

MONITORING OF SOIL GASES & GROUNDWATER

PROJECT NO. **P3779**

SITE. Mill Hill Road, Hinkley

CLIENT. David Wilson Homes (East Midlands)

DATE. 10-Oct-06

CONDITIONS. Overcast / Dry

OPERATOR. Tony Heron

EQUIPMENT. **LMSxi Gas Data Recorder**

Ground Risk Management Limited
Bretby Business Park
Ashby Road
Burton-upon-Trent
Staffordshire
DE15 0YZ
Telephone: (01283) 551249
Facsimile: (01283) 211968
Email: mail@grm-uk.com

Borehole / Well No	Methane (CH_4) %	Carbon Dioxide (CO_2) %	Oxygen (O_2) %	Flow L/hr	Atmospheric Pressure	Depth to Groundwater	Depth to Borehole / Well Base
WS 1	0.0	1.8	19.3	0.0	1000	Dry	4.00
WS 3	0.0	7.8	9.6	0.0	1000	Dry	4.08
WS 5	0.0	1.7	19.1	0.0	1000	Dry	7.00
WS 6	0.0	4.4	11.2	0.0	1000	4.42	6.00
WS 9	0.0	1.7	19.0	0.0	1000	Dry	4.04
WS 11	0.0	1.4	18.7	0.0	1000	Dry	4.35
WS 13	0.0	0.3	19.9	0.0	1000	Dry	3.98

Notes

N/D	=	Not Detected
N/R	=	Not Recorded
%	=	By Volume

Signed (Operator) .....

MONITORING OF SOIL GASES & GROUNDWATER

PROJECT NO. **P3779**

SITE. Mill Hill Road, Hinkley

CLIENT. David Wilson Homes (East Midlands)

DATE. 03-Oct-06

CONDITIONS. Overcast / Dry

OPERATOR. Tony Heron

EQUIPMENT. **LMSxi Gas Data Recorder**

Ground Risk Management Limited
Bretby Business Park
Ashby Road
Burton-upon-Trent
Staffordshire
DE15 0YZ
Telephone: (01283) 551249
Facsimile: (01283) 211968
Email: mail@grm-uk.com

Borehole / Well No	Methane (CH_4) %	Carbon Dioxide (CO_2) %	Oxygen (O_2) %	Flow L/hr	Atmospheric Pressure	Depth to Groundwater	Depth to Borehole / Well Base
WS 1	0.0	1.7	19.3	0.0	983	Dry	4.00
WS 3	0.0	6.5	10.6	0.0	983	Dry	4.08
WS 5	0.0	1.4	19.5	0.0	983	Dry	7.00
WS 6	0.0	4.1	10.5	0.0	983	4.08	6.00
WS 9	0.0	1.6	18.9	0.0	983	Dry	4.04
WS 11	0.0	0.7	17.1	0.0	983	Dry	4.35
WS 13	0.0	0.3	19.9	0.0	983	Dry	3.98

Notes

N/D	=	Not Detected
N/R	=	Not Recorded
%	=	By Volume

Signed (Operator) .....

MONITORING OF SOIL GASES & GROUNDWATER

PROJECT NO. **P3779**

SITE. Mill Hill Road, Hinkley

CLIENT. David Wilson Homes (East Midlands)

DATE. 26-Sep-06

CONDITIONS. Overcast / Wet

OPERATOR. Tony Heron

Ground Risk Management Limited
Bretby Business Park
Ashby Road
Burton-upon-Trent
Staffordshire
DE15 0YZ
Telephone: (01283) 551249
Facsimile: (01283) 211968
Email: mail@grm-uk.com

EQUIPMENT. **LMSxi Gas Data Recorder**

Borehole / Well No	Methane (CH_4) %	Carbon Dioxide (CO_2) %	Oxygen (O_2) %	Flow L/hr	Atmospheric Pressure	Depth to Groundwater	Depth to Borehole / Well Base
WS 1	0.0	1.0	19.4	0.0	1000	Dry	4.00
WS 3	0.0	4.3	13.5	0.0	1000	Dry	4.08
WS 5	0.0	0.3	20.2	0.0	1000	Dry	7.00
WS 6	0.8	2.8	13.9	0.0	1000	4.82	6.00
WS 9	0.0	0.5	20.2	0.0	1000	Dry	4.04
WS 11	0.0	0.5	20.1	0.0	1000	Dry	4.35
WS 13	0.0	0.0	20.4	0.0	1000	Dry	3.98

Notes

N/D	=	Not Detected
N/R	=	Not Recorded
%	=	By Volume

Signed (Operator) .....

APPENDIX H

GRM Development Solutions
geoenvironmental - civil - structural

ALcontrol Technichem

Heron Drive,
Langley,
Slough SL3 8XP
tel: 01753 212500
fax: 01753 212501
email: langley@alcontrol.co.uk

Clive Kirby
Ground Risk Management Ltd
Bretby Business Park
Ashby Road
Burton-on-Trent
DE15 0YZ

29 September 2006

TEST REPORT

Our Report Number: 06-21205

Your Order Reference: Instructions of 26/09/2006

20 soil samples submitted for analysis on 26/09/2006

Project Name: Mill Hill Road, Hinckley

Project Code: P3779

Laboratory analysis started on 26/09/2006
All laboratory analysis completed by 29 September 2006

Rexona Rahman
Analytical Reporting Manager
ALCONTROL TECHNICHEM

Sharon Googh
Project Co-Ordinator
ALCONTROL TECHNICHEM

Test methods are documented in house procedures or where appropriate standard methods. Non accredited tests (if applicable) are identified on each page. Procedures for sampling are outside the scope of the laboratory UKAS accreditation. Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation. All samples connected with this report , including any 'on hold', will be stored and disposed of according to company policy. A copy of this policy is available on request.

RECEIVED
4 OCT 2006

ALcontrol Technichem is a trading division of ALcontrol UK Limited.
Registered Office: Templeborough House, Mill Close, Rotherham S60 1BZ. Registered in England and Wales No. 4057291

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

UKAS TESTING
1141

ALcontrol Technichem
Sample Description

Job Number: 06-21205
Client: Ground Risk Management Ltd
Project Code: P3779

Matrix: Soil
Project Name: Mill Hill Road, Hinckley

Laboratory Reference No	Sample Reference	Sample Depth (m)	Date Sampled	Sample Description
174341	WS1	0.3	20/09/06	Orange sandy clay with gravel and brick
174342	WS2	0.30-0.40	20/09/06	Brown sandy clay
174343	WS2	2.80-3.00	20/09/06	Brown sandy clay with rubble
174344	WS3	0.4	20/09/06	Brown sandy clay
174345	WS3	1.20-1.30	20/09/06	Brown sandy clay with gravel and brick
174346	WS4	0.10-0.20	20/09/06	Brown sandy clay with gravel and brick
174347	WS5	0.60-0.80	20/09/06	Brown sandy clay with rubble
174348	WS5	1.70-1.80	20/09/06	Brown sandy clay with gravel
174349	WS6	0.50-0.60	20/09/06	Brown clay with rubble
174350	WS7	1.50-1.70	20/09/06	Brown sandy clay
174351	WS8	0.40-0.60	20/09/06	Brown sandy clay
174352	WS8	2.60-2.80	20/09/06	Brown sandy clay
174353	WS8	4.70-5.00	20/09/06	Light brown sand
174354	WS10	0.30-0.50	20/09/06	Brown sandy clay with gravel
174355	WS11	0.20-0.40	20/09/06	Brown clay with rubble
174356	WS12	0.30-0.40	20/09/06	Brown sandy clay with gravel
174357	WS13	0.08-1.50	20/09/06	Brown sandy clay with gravel and brick
174358	WS14	0.12-0.30	20/09/06	Brown sandy clay with gravel and brick
174359	WS14	2.60-2.80	20/09/06	Brown sandy clay
174360	WS15	2.70-3.00	20/09/06	Brown clay

ALcontrol Technichem
Table Of Results

Job Number : 06-21205
Matrix : Soil
Project Code: P3779

Project Name: Mill Hill Road, Hinckley
Client : Ground Risk Management Ltd

Sample Reference	WS1	WS2	WS2	WS3	WS3	Method No	Units	LOD
Sample Depth (m)	0.30	0.30-0.40	2.80-3.00	0.40	1.20-1.30			
Date Sampled	20/09/06	20/09/06	20/09/06	20/09/06	20/09/06			
Date Scheduled	26/09/06	26/09/06	26/09/06	26/09/06	26/09/06			
Laboratory Reference No	174341	174342	174343	174344	174345			
Analysis								
Moisture Content (Dry Weight)	12.3	15.8	16.6	56.6	17.9		%	0.1
Moisture Content (Wet Weight)	11.0	13.7	14.2	36.1	15.1		%	0.1
Arsenic	8.8	10	11	14	13	069S[M]	mg/kg	1
Boron (W/S)	1.6	1.3	2.2	1.4	1.2	016S[M]	mg/kg	0.5
Cadmium	< 0.5	0.6	1.0	0.8	0.6	069S[M]	mg/kg	0.5
Chromium	23	23	38	30	25	069S[M]	mg/kg	5
Copper	20	34	83	50	32	069S[M]	mg/kg	2
Lead	33	97	140	110	89	069S[M]	mg/kg	5
Mercury	0.6	0.7	0.8	0.7	0.7	069S[M]	mg/kg	0.3
Nickel	19	24	32	31	28	069S[M]	mg/kg	2
Selenium	< 1	< 1	< 1	< 1	< 1	069S[M]	mg/kg	1
W/S Sulphate as SO4	0.27	0.02	0.33	< 0.02	0.02	074[M]	g/l	0.02
Zinc	71	170	220	120	81	069S[M]	mg/kg	2
Total Cyanide	< 5	< 5	< 5	< 5	< 5	061S[M]	mg/kg	5
Organic Matter	0.61	2.9	4.9	5.1	3.3	092	%	0.2
Organic Carbon	0.4	1.7	2.8	2.9	1.9	092	%	0.1
Fraction Organic Carbon	0.004	0.017	0.028	0.029	0.019	092		0.001
pH	7.7	6.0	8.2	6.9	7.5	009S[M]	pH Units	
** EPH SUITE **								
EPH (C10-C40)	9	-	-	54	-	070S[M]	mg/kg	5
** PHENOLS SUITE **								
Phenol	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	020S[M]	mg/kg	0.1
Total Monohydric Phenols	< 1	< 1	< 1	< 1	< 1	020S[I]	mg/kg	1

[I] ISO 17025 accredited.
[M] MCERTS accredited for sand, loam and clay.

ALcontrol Technichem
Table Of Results

Job Number : 06-21205
Matrix : Soil
Project Code: P3779

Project Name: Mill Hill Road, Hinckley
Client : Ground Risk Management Ltd

Sample Reference	WS4	WS5	WS5	WS6	WS7	Method No	Units	LOD
Sample Depth (m)	0.10-0.20	0.60-0.80	1.70-1.80	0.50-0.60	1.50-1.70			
Date Sampled	20/09/06	20/09/06	20/09/06	20/09/06	20/09/06			
Date Scheduled	26/09/06	26/09/06	26/09/06	26/09/06	26/09/06			
Laboratory Reference No	174346	174347	174348	174349	174350			
Analysis								
Moisture Content (Dry Weight)	20.6	16.4	20.0	13.4	18.8		%	0.1
Moisture Content (Wet Weight)	17.1	14.1	16.7	11.8	15.8		%	0.1
Arsenic	14	13	13	12	20	069S[IM]	mg/kg	1
Boron (W/S)	1.2	2.7	2.5	2.5	2.1	016S[IM]	mg/kg	0.5
Cadmium	0.7	0.5	0.5	0.6	0.6	069S[IM]	mg/kg	0.5
Chromium	26	25	23	26	32	069S[IM]	mg/kg	5
Copper	45	28	31	24	27	069S[IM]	mg/kg	2
Lead	130	55	120	36	47	069S[IM]	mg/kg	5
Mercury	0.7	0.6	0.7	0.6	0.6	069S[IM]	mg/kg	0.3
Nickel	27	27	25	28	32	069S[IM]	mg/kg	2
Selenium	< 1	< 1	< 1	< 1	< 1	069S[IM]	mg/kg	1
W/S Sulphate as SO4	0.03	0.21	0.06	1.3	0.09	074[IM]	g/l	0.02
Zinc	130	94	81	93	77	069S[IM]	mg/kg	2
Total Cyanide	< 5	< 5	< 5	< 5	< 5	061S[IM]	mg/kg	5
Organic Matter	3.4	2.0	1.8	1.3	1.6	092	%	0.2
Organic Carbon	2.0	1.2	1.1	0.7	0.9	092	%	0.1
Fraction Organic Carbon	0.020	0.012	0.011	0.007	0.009	092		0.001
pH	7.8	8.4	8.0	8.5	8.1	009S[IM]	pH Units	
** EPH SUITE **								
EPH (C10-C40)	-	16	-	15	-	070S[IM]	mg/kg	5
** PHENOLS SUITE **								
Phenol	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	020S[IM]	mg/kg	0.1
Total Monohydric Phenols	< 1	< 1	< 1	< 1	< 1	020S[I]	mg/kg	1

[I] ISO 17025 accredited.
[M] MCERTS accredited for sand, loam and clay.

ALcontrol Technichem
Table Of Results

Job Number : 06-21205
Matrix : Soil
Project Code: P3779

Project Name: Mill Hill Road, Hinckley
Client : Ground Risk Management Ltd

Sample Reference	WS8	WS8	WS8	WS10	WS11	Method No	Units	LOD
Sample Depth (m)	0.40-0.60	2.60-2.80	4.70-5.00	0.30-0.50	0.20-0.40			
Date Sampled	20/09/06	20/09/06	20/09/06	20/09/06	20/09/06			
Date Scheduled	26/09/06	26/09/06	26/09/06	26/09/06	26/09/06			
Laboratory Reference No	174351	174352	174353	174354	174355			
Analysis								
Moisture Content (Dry Weight)	24.8	18.2	24.9	13.1	17.0		%	0.1
Moisture Content (Wet Weight)	19.9	15.4	19.9	11.6	14.5		%	0.1
Arsenic	-	-	-	9.5	13	069S[M]	mg/kg	1
Boron (W/S)	-	-	-	1.5	0.7	016S[M]	mg/kg	0.5
Cadmium	-	-	-	< 0.5	0.6	069S[M]	mg/kg	0.5
Chromium	-	-	-	22	31	069S[M]	mg/kg	5
Copper	-	-	-	21	31	069S[M]	mg/kg	2
Lead	-	-	-	51	460	069S[M]	mg/kg	5
Mercury	-	-	-	0.5	0.5	069S[M]	mg/kg	0.3
Nickel	-	-	-	19	30	069S[M]	mg/kg	2
Selenium	-	-	-	< 1	< 1	069S[M]	mg/kg	1
W/S Sulphate as SO4	-	-	-	0.06	0.02	074[M]	g/l	0.02
Zinc	-	-	-	72	110	069S[M]	mg/kg	2
Total Cyanide	-	-	-	< 5	< 5	061S[M]	mg/kg	5
Organic Matter	-	-	-	2.0	1.7	092	%	0.2
Organic Carbon	-	-	-	1.1	1.0	092	%	0.1
Fraction Organic Carbon	-	-	-	0.011	0.010	092		0.001
pH	-	-	-	7.5	8.9	009S[M]	pH Units	
** EPH SUITE **								
EPH (C10-C40)	1100	-	8	9	-	070S[M]	mg/kg	5
** PHENOLS SUITE **								
Phenol	-	-	-	< 0.1	< 0.1	020S[M]	mg/kg	0.1
Total Monohydric Phenols	-	-	-	< 1	< 1	020S[I]	mg/kg	1

[I] ISO 17025 accredited.
[M] MCERTS accredited for sand, loam and clay.

ALcontrol Technichem
Table Of Results

Job Number : 06-21205
Matrix : Soil
Project Code: P3779

Project Name: Mill Hill Road, Hinckley
Client : Ground Risk Management Ltd

Sample Reference	WS12	WS13	WS14	WS14	WS15	Method No	Units	LOD
Sample Depth (m)	0.30-0.40	0.08-1.50	0.12-0.30	2.60-2.80	2.70-3.00			
Date Sampled	20/09/06	20/09/06	20/09/06	20/09/06	20/09/06			
Date Scheduled	26/09/06	26/09/06	26/09/06	26/09/06	26/09/06			
Laboratory Reference No	174356	174357	174358	174359	174360			
Analysis								
Moisture Content (Dry Weight)	18.2	16.2	17.2	16.3	16.4		%	0.1
Moisture Content (Wet Weight)	15.4	14.0	14.7	14.0	14.1		%	0.1
Arsenic	12	17	7.4	-	-	069S[IM]	mg/kg	1
Boron (W/S)	1.8	2.9	1.2	-	-	016S[IM]	mg/kg	0.5
Cadmium	0.5	1.0	< 0.5	-	-	069S[IM]	mg/kg	0.5
Chromium	22	29	23	-	-	069S[IM]	mg/kg	5
Copper	38	84	43	-	-	069S[IM]	mg/kg	2
Lead	86	270	72	-	-	069S[IM]	mg/kg	5
Mercury	9.4	0.4	0.3	-	-	069S[IM]	mg/kg	0.3
Nickel	23	33	49	-	-	069S[IM]	mg/kg	2
Selenium	< 1	< 1	< 1	-	-	069S[IM]	mg/kg	1
W/S Sulphate as SO4	0.02	0.16	0.18	-	-	074[IM]	g/l	0.02
Zinc	81	470	100	-	-	069S[IM]	mg/kg	2
Total Cyanide	< 5	< 5	< 5	-	-	061S[IM]	mg/kg	5
Organic Matter	2.6	6.6	4.7	-	-	092	%	0.2
Organic Carbon	1.5	3.8	2.7	-	-	092	%	0.1
Fraction Organic Carbon	0.015	0.038	0.027	-	-	092		0.001
pH	7.8	10.8	10.0	-	-	009S[IM]	pH Units	
** EPH SUITE **								
EPH (C10-C40)	11	-	-	12	15	070S[IM]	mg/kg	5
** PHENOLS SUITE **								
Phenol	< 0.1	< 0.1	< 0.1	-	-	020S[IM]	mg/kg	0.1
Total Monohydric Phenols	< 1	< 1	< 1	-	-	020S[I]	mg/kg	1

[I] ISO 17025 accredited.
[M] MCERTS accredited for sand, loam and clay.

ALcontrol Technichem
Table Of Results

Job Number : 06-21205
Matrix : Soil
Project Code: P3779

Project Name: Mill Hill Road, Hinckley
Client : Ground Risk Management Ltd

Sample Reference	WS1	WS2	WS2	WS3	WS3	Method No	Units	LOD
Sample Depth (m)	0.30	0.30-0.40	2.80-3.00	0.40	1.20-1.30			
Date Sampled	20/09/06	20/09/06	20/09/06	20/09/06	20/09/06			
Date Scheduled	26/09/06	26/09/06	26/09/06	26/09/06	26/09/06			
Laboratory Reference No	174341	174342	174343	174344	174345			
Analysis								
** PAH SUITE **								
Naphthalene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Acenaphthylene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Acenaphthene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Fluorene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Phenanthrene	< 0.1	< 0.1	0.10	0.31	0.34	022S[IM]	mg/kg	0.1
Anthracene	< 0.1	< 0.1	< 0.1	0.16	0.18	022S[IM]	mg/kg	0.1
Fluoranthene	< 0.1	0.20	0.17	1.2	1.2	022S[IM]	mg/kg	0.1
Pyrene	< 0.1	0.17	0.16	1.0	1.3	022S[IM]	mg/kg	0.1
Benzo(a)anthracene	< 0.1	< 0.1	< 0.1	0.45	0.71	022S[IM]	mg/kg	0.1
Chrysene	< 0.1	0.13	0.10	0.66	0.75	022S[IM]	mg/kg	0.1
Benzo(b)fluoranthene	< 0.1	< 0.1	< 0.1	0.34	0.82	022S[IM]	mg/kg	0.1
Benzo(k)fluoranthene	< 0.1	< 0.1	< 0.1	0.41	0.78	022S[IM]	mg/kg	0.1
Benzo(a)pyrene	< 0.1	< 0.1	< 0.1	0.38	1.0	022S[IM]	mg/kg	0.1
Indeno(1,2,3-cd)pyrene	< 0.1	< 0.1	< 0.1	0.17	0.57	022S[IM]	mg/kg	0.1
Dibenzo(a,h)anthracene	< 0.1	< 0.1	< 0.1	< 0.1	0.13	022S[IM]	mg/kg	0.1
Benzo(g,h,i)perylene	< 0.1	< 0.1	< 0.1	0.19	0.54	022S[IM]	mg/kg	0.1
PAH (Sum of EPA 16)	ND	0.50	0.55	5.28	8.34	022S[I]	mg/kg	0.1

[I] ISO 17025 accredited.
[M] MCERTS accredited for sand, loam and clay.

ALcontrol Technichem
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Job Number : 06-21205
Matrix : Soil
Project Code: P3779

Project Name: Mill Hill Road, Hinckley
Client : Ground Risk Management Ltd

Sample Reference	WS4	WS5	WS5	WS6	WS7	Method No	Units	LOD
Sample Depth (m)	0.10-0.20	0.60-0.80	1.70-1.80	0.50-0.60	1.50-1.70			
Date Sampled	20/09/06	20/09/06	20/09/06	20/09/06	20/09/06			
Date Scheduled	26/09/06	26/09/06	26/09/06	26/09/06	26/09/06			
Laboratory Reference No	174346	174347	174348	174349	174350			
Analysis								
**** PAH SUITE ****								
Naphthalene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Acenaphthylene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Acenaphthene	0.40	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Fluorene	0.34	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Phenanthrene	3.2	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Anthracene	0.88	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Fluoranthene	4.4	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Pyrene	3.7	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Benzo(a)anthracene	1.4	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Chrysene	1.7	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Benzo(b)fluoranthene	0.87	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Benzo(k)fluoranthene	1.1	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Benzo(a)pyrene	1.0	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Indeno(1,2,3-cd)pyrene	0.43	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Dibenzo(a,h)anthracene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Benzo(g,h,i)perylene	0.47	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
PAH (Sum of EPA 16)	19.75	ND	ND	ND	ND	022S[I]	mg/kg	0.1

[I] ISO 17025 accredited.
[M] MCERTS accredited for sand, loam and clay.

ALcontrol Technichem
Table Of Results

Job Number : 06-21205
Matrix : Soil
Project Code: P3779

Project Name: Mill Hill Road, Hinckley
Client : Ground Risk Management Ltd

Sample Reference	WS8	WS10	WS11	WS12	WS13	Method No	Units	LOD
Sample Depth (m)	2.60-2.80	0.30-0.50	0.20-0.40	0.30-0.40	0.08-1.50			
Date Sampled	20/09/06	20/09/06	20/09/06	20/09/06	20/09/06			
Date Scheduled	26/09/06	26/09/06	26/09/06	26/09/06	26/09/06			
Laboratory Reference No	174352	174354	174355	174356	174357			
Analysis								
** PAH SUITE **								
Naphthalene	< 0.1	< 0.1	< 0.1	< 0.1	0.15	022S[IM]	mg/kg	0.1
Acenaphthylene	0.41	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Acenaphthene	0.25	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Fluorene	0.43	< 0.1	< 0.1	< 0.1	< 0.1	022S[IM]	mg/kg	0.1
Phenanthrene	0.73	< 0.1	< 0.1	< 0.1	0.63	022S[IM]	mg/kg	0.1
Anthracene	< 0.1	< 0.1	< 0.1	< 0.1	0.17	022S[IM]	mg/kg	0.1
Fluoranthene	< 0.1	< 0.1	< 0.1	< 0.1	1.0	022S[IM]	mg/kg	0.1
Pyrene	0.20	< 0.1	< 0.1	< 0.1	0.85	022S[IM]	mg/kg	0.1
Benzo(a)anthracene	< 0.1	< 0.1	< 0.1	< 0.1	0.46	022S[IM]	mg/kg	0.1
Chrysene	< 0.1	< 0.1	< 0.1	< 0.1	0.51	022S[IM]	mg/kg	0.1
Benzo(b)fluoranthene	< 0.1	< 0.1	< 0.1	< 0.1	0.59	022S[IM]	mg/kg	0.1
Benzo(k)fluoranthene	< 0.1	< 0.1	< 0.1	< 0.1	0.40	022S[IM]	mg/kg	0.1
Benzo(a)pyrene	< 0.1	< 0.1	< 0.1	< 0.1	0.57	022S[IM]	mg/kg	0.1
Indeno(1,2,3-cd)pyrene	< 0.1	< 0.1	< 0.1	< 0.1	0.37	022S[IM]	mg/kg	0.1
Dibenzo(a,h)anthracene	< 0.1	< 0.1	< 0.1	< 0.1	0.12	022S[IM]	mg/kg	0.1
Benzo(g,h,i)perylene	< 0.1	< 0.1	< 0.1	< 0.1	0.42	022S[IM]	mg/kg	0.1
PAH (Sum of EPA 16)	2.02	ND	ND	ND	6.24	022S[I]	mg/kg	0.1

[I] ISO 17025 accredited.
[M] MCERTS accredited for sand, loam and clay.

ALcontrol Technichem
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Project Name: Mill Hill Road, Hinckley
Client : Ground Risk Management Ltd

Job Number : 06-21205
Matrix : Soil
Project Code: P3779

Sample Reference	WS14					Method No	Units	LOD
Sample Depth (m)	0.12-0.30							
Date Sampled	20/09/06							
Date Scheduled	26/09/06							
Laboratory Reference No	174358							
Analysis								
** PAH SUITE **								
Naphthalene	< 0.1					022S[IM]	mg/kg	0.1
Acenaphthylene	< 0.1					022S[IM]	mg/kg	0.1
Acenaphthene	< 0.1					022S[IM]	mg/kg	0.1
Fluorene	< 0.1					022S[IM]	mg/kg	0.1
Phenanthrene	0.14					022S[IM]	mg/kg	0.1
Anthracene	< 0.1					022S[IM]	mg/kg	0.1
Fluoranthene	0.14					022S[IM]	mg/kg	0.1
Pyrene	0.13					022S[IM]	mg/kg	0.1
Benzo(a)anthracene	< 0.1					022S[IM]	mg/kg	0.1
Chrysene	< 0.1					022S[IM]	mg/kg	0.1
Benzo(b)fluoranthene	0.11					022S[IM]	mg/kg	0.1
Benzo(k)fluoranthene	< 0.1					022S[IM]	mg/kg	0.1
Benzo(a)pyrene	< 0.1					022S[IM]	mg/kg	0.1
Indeno(1,2,3-cd)pyrene	< 0.1					022S[IM]	mg/kg	0.1
Dibenzo(a,h)anthracene	< 0.1					022S[IM]	mg/kg	0.1
Benzo(g,h,i)perylene	< 0.1					022S[IM]	mg/kg	0.1
PAH (Sum of EPA 16)	0.52					022S[I]	mg/kg	0.1

[I] ISO 17025 accredited.
[M] MCERTS accredited for sand, loam and clay.

ALcontrol Technichem
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Job Number : 06-21205
Matrix : Soil
Project Code: P3779

Project Name: Mill Hill Road, Hinckley
Client : Ground Risk Management Ltd

Sample Reference	WS8					Method No	Units	LOD
Sample Depth (m)	2.60-2.80							
Date Sampled	20/09/06							
Date Scheduled	26/09/06							
Laboratory Reference No	174352							
Analysis								
** CWG SUITE **								
Aliphatic C5-C6	0.28					CWGS	mg/kg	0.01
Aliphatic >C6-C8	0.51					CWGS	mg/kg	0.01
Aliphatic >C8-C10	11					CWGS	mg/kg	0.01
Aliphatic >C10-C12	100					CWGS	mg/kg	0.01
Aliphatic >C12-C16	2000					CWGS[I]	mg/kg	5
Aliphatic >C16-C21	1600					CWGS[I]	mg/kg	5
Aliphatic >C21-C35	400					CWGS[I]	mg/kg	5
Total Aliphatics (C5-C35)	4200					CWGS	mg/kg	5
Aromatic C6-C7	0.02					CWGS	mg/kg	0.01
Aromatic >C7-C8	< 0.01					CWGS	mg/kg	0.01
Aromatic >C8-C10	17					CWGS	mg/kg	0.01
Aromatic >C10-C12	150					CWGS	mg/kg	0.01
Aromatic >C12-C16	490					CWGS[I]	mg/kg	5
Aromatic >C16-C21	660					CWGS[I]	mg/kg	5
Aromatic >C21-C35	190					CWGS[I]	mg/kg	5
Total Aromatics (C5-C35)	1500					CWGS	mg/kg	5
Volatile Hydrocarbons (C5-C12)	280					CWGS	mg/kg	0.01
Extractable Hydrocarbons (C12-C35)	5400					CWGS	mg/kg	5
"Total" Hydrocarbons (C5-C35)	5700					CWGS	mg/kg	5
MTBE	< 0.010					CWGS[IM]	mg/kg	0.01
Benzene	0.016					CWGS[IM]	mg/kg	0.01
Toluene	< 0.010					CWGS[IM]	mg/kg	0.01
Ethylbenzene	< 0.010					CWGS[IM]	mg/kg	0.01
m,p-Xylenes	0.034					CWGS[IM]	mg/kg	0.01
o-Xylene	0.34					CWGS[IM]	mg/kg	0.01
1,3,5-Trimethylbenzene	< 0.010					CWGS[IM]	mg/kg	0.01
1,2,4-Trimethylbenzene	< 0.010					CWGS[IM]	mg/kg	0.01

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ALcontrol Technichem
Table Of Results

Job Number : 06-21205
Matrix : Soil
Project Code: P3779

Project Name: Mill Hill Road, Hinckley
Client : Ground Risk Management Ltd

Sample Reference	WS1	WS3	WS5	WS6	WS8	Method No	Units	LOD
Sample Depth (m)	0.30	0.40	0.60-0.80	0.50-0.60	2.60-2.80			
Date Sampled	20/09/06	20/09/06	20/09/06	20/09/06	20/09/06			
Date Scheduled	26/09/06	26/09/06	26/09/06	26/09/06	26/09/06			
Laboratory Reference No	174341	174344	174347	174349	174352			
Analysis								
* * VOC SUITE * *								
Dichlorodifluoromethane	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
Chloromethane	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
Vinyl Chloride	< 10	< 10	< 10	< 10	< 10	071S	ug/kg	10
Bromomethane	< 20	< 20	< 20	< 20	< 20	071S[I]	ug/kg	20
Chloroethane	< 10	< 10	< 10	< 10	< 10	071S[IM]	ug/kg	10
Trichlorofluoromethane	< 10	< 10	< 10	< 10	< 10	071S[IM]	ug/kg	10
1,1-Dichloroethene	< 20	< 20	< 20	< 20	< 20	071S	ug/kg	20
112-Trichl-122-Trifluoroethane	< 25	< 25	< 25	< 25	< 25	071S[I]	ug/kg	25
Dichloromethane	< 25	< 25	< 25	< 25	< 25	071S	ug/kg	25
Carbon Disulfide	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
Trans-1,2 Dichloroethene	< 10	< 10	< 10	< 10	< 10	071S	ug/kg	10
MTBE	< 10	< 10	< 10	< 10	< 10	071S	ug/kg	10
1,1 -Dichloroethane	< 10	< 10	< 10	< 10	< 10	071S	ug/kg	10
Cis-1,2 Dichloroethene	< 10	< 10	< 10	< 10	< 10	071S[IM]	ug/kg	10
Bromochloromethane	< 10	< 10	< 10	< 10	< 10	071S[IM]	ug/kg	10
Chloroform	< 10	< 10	< 10	< 10	< 10	071S[IM]	ug/kg	10
2,2-Dichloropropane	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
1,1,1-Trichloroethane	< 20	< 20	< 20	< 20	< 20	071S	ug/kg	20
1,2-Dichloroethane	< 20	< 20	< 20	< 20	< 20	071S	ug/kg	20
1,1-Dichloropropene	< 10	< 10	< 10	< 10	< 10	071S[IM]	ug/kg	10
Benzene	< 20	< 20	< 20	< 20	< 20	071S	ug/kg	20
Carbon Tetrachloride	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
Dibromomethane	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
1,2-Dichloropropane	< 10	< 10	< 10	< 10	< 10	071S[IM]	ug/kg	10
Trichloroethene	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
Bromodichloromethane	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
Cis-1,3 Dichloropropene	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
Trans-1,3 Dichloropropene	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
1,1,2-Trichloroethane	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20

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ALcontrol Technichem
Table Of Results

Job Number : 06-21205
Matrix : Soil
Project Code: P3779

Project Name: Mill Hill Road, Hinckley
Client : Ground Risk Management Ltd

Sample Reference	WS1	WS3	WS5	WS6	WS8	Method No	Units	LOD
Sample Depth (m)	0.30	0.40	0.60-0.80	0.50-0.60	2.60-2.80			
Date Sampled	20/09/06	20/09/06	20/09/06	20/09/06	20/09/06			
Date Scheduled	26/09/06	26/09/06	26/09/06	26/09/06	26/09/06			
Laboratory Reference No	174341	174344	174347	174349	174352			
Analysis								
** VOC SUITE Cont. **								
Toluene	< 20	< 20	< 20	< 20	< 20	071S	ug/kg	20
1,3 -Dichloropropane	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
Dibromochloromethane	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
1,2-Dibromoethane	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
Tetrachloroethene	< 20	< 20	< 20	< 20	< 20	071S	ug/kg	20
1,1,1,2-Tetrachloroethane	< 10	< 10	< 10	< 10	< 10	071S	ug/kg	10
Chlorobenzene	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
Ethyl Benzene	< 20	< 20	< 20	< 20	< 20	071S	ug/kg	20
m,p-Xylenes	< 30	< 30	< 30	< 30	< 30	071S	ug/kg	30
Bromoform	< 10	< 10	< 10	< 10	< 10	071S[IM]	ug/kg	10
Styrene	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
o-Xylene	< 20	< 20	< 20	< 20	< 20	071S	ug/kg	20
1,1,2,2 Tetrachloroethane	< 10	< 10	< 10	< 10	< 10	071S	ug/kg	10
1,2,3-Trichloropropane	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
Isopropylbenzene	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
Bromobenzene	< 10	< 10	< 10	< 10	< 10	071S[IM]	ug/kg	10
n-propylbenzene	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
2-Chlorotoluene	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
4-Chlorotoluene	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
1,3,5 Trimethylbenzene	< 20	< 20	< 20	< 20	< 20	071S	ug/kg	20
tert-butylbenzene	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
1,2,4 Trimethylbenzene	< 20	< 20	< 20	< 20	< 20	071S	ug/kg	20
sec-butylbenzene	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
1,3 Dichlorobenzene	< 20	< 20	< 20	< 20	< 20	071S	ug/kg	20
1,4 Dichlorobenzene	< 20	< 20	< 20	< 20	< 20	071S	ug/kg	20
4-Isopropyltoluene	< 20	< 20	< 20	< 20	< 20	071S[IM]	ug/kg	20
1,2 Dichlorobenzene	< 20	< 20	< 20	< 20	< 20	071S	ug/kg	20
n-butylbenzene	< 20	< 20	< 20	< 20	< 20	071S	ug/kg	20
1,2,4-Trichlorobenzene	< 20	< 20	< 20	< 20	< 20	071S	ug/kg	20

[I] ISO 17025 accredited.
[M] MCERTS accredited for sand, loam and clay.

ALcontrol Technichem
Table Of Results

Job Number : 06-21205
Matrix : Soil
Project Code: P3779

Project Name: Mill Hill Road, Hinckley
Client : Ground Risk Management Ltd

Sample Reference	WS1	WS3	WS5	WS6	WS8	Method No's	Units	LOD
Sample Depth (m)	0.30	0.40	0.60-0.80	0.50-0.60	2.60-2.80			
Date Sampled	20/09/06	20/09/06	20/09/06	20/09/06	20/09/06			
Date Scheduled	26/09/06	26/09/06	26/09/06	26/09/06	26/09/06			
Laboratory Reference No	174341	174344	174347	174349	174352			
Analysis								
** VOC SUITE Cont. **								
1,2-Dibromo-3-Chloropropane	< 20	< 20	< 20	< 20	< 20	071S	ug/kg	20
Hexachlorobutadiene	< 20	< 20	< 20	< 20	< 20	071S	ug/kg	20
1,2,3-Trichlorobenzene	< 20	< 20	< 20	< 20	< 20	071S	ug/kg	20

[I] ISO 17025 accredited.
[M] MCERTS accredited for sand, loam and clay.

ALcontrol Technichem
Table Of Results

Job Number : 06-21205
Matrix : Soil
Project Code: P3779

Project Name: Mill Hill Road, Hinckley
Client : Ground Risk Management Ltd

Sample Reference	WS10	WS12				Method No	Units	LOD
Sample Depth (m)	0.30-0.50	0.30-0.40						
Date Sampled	20/09/06	20/09/06						
Date Scheduled	26/09/06	26/09/06						
Laboratory Reference No	174354	174356						
Analysis								
** VOC SUITE **								
Dichlorodifluoromethane	< 20	< 20				071S[IM]	ug/kg	20
Chloromethane	< 20	< 20				071S[IM]	ug/kg	20
Vinyl Chloride	< 10	< 10				071S	ug/kg	10
Bromomethane	< 20	< 20				071S[I]	ug/kg	20
Chloroethane	< 10	< 10				071S[IM]	ug/kg	10
Trichlorofluoromethane	< 10	< 10				071S[IM]	ug/kg	10
1,1-Dichloroethene	< 20	< 20				071S	ug/kg	20
112-Trichl-122-Trifluoroethane	< 25	< 25				071S[I]	ug/kg	25
Dichloromethane	< 25	< 25				071S	ug/kg	25
Carbon Disulfide	< 20	< 20				071S[IM]	ug/kg	20
Trans-1,2 Dichloroethene	< 10	< 10				071S	ug/kg	10
MTBE	< 10	< 10				071S	ug/kg	10
1,1 -Dichloroethane	< 10	< 10				071S	ug/kg	10
Cis-1,2 Dichloroethene	< 10	< 10				071S[IM]	ug/kg	10
Bromochloromethane	< 10	< 10				071S[IM]	ug/kg	10
Chloroform	< 10	< 10				071S[IM]	ug/kg	10
2,2-Dichloropropane	< 20	< 20				071S[IM]	ug/kg	20
1,1,1-Trichloroethane	< 20	< 20				071S	ug/kg	20
1,2-Dichloroethane	< 20	< 20				071S	ug/kg	20
1,1-Dichloropropene	< 10	< 10				071S[IM]	ug/kg	10
Benzene	< 20	< 20				071S	ug/kg	20
Carbon Tetrachloride	< 20	< 20				071S[IM]	ug/kg	20
Dibromomethane	< 20	< 20				071S[IM]	ug/kg	20
1,2-Dichloropropane	< 10	< 10				071S[IM]	ug/kg	10
Trichloroethene	< 20	< 20				071S[IM]	ug/kg	20
Bromodichloromethane	< 20	< 20				071S[IM]	ug/kg	20
Cis-1,3 Dichloropropene	< 20	< 20				071S[IM]	ug/kg	20
Trans-1,3 Dichloropropene	< 20	< 20				071S[IM]	ug/kg	20
1,1,2-Trichloroethane	< 20	< 20				071S[IM]	ug/kg	20

[I] ISO 17025 accredited.
[M] MCERTS accredited for sand, loam and clay.

ALcontrol Technichem
Table Of Results

Job Number : 06-21205
Matrix : Soil
Project Code: P3779

Project Name: Mill Hill Road, Hinckley
Client : Ground Risk Management Ltd

Sample Reference	WS10	WS12				Method No	Units	LOD
Sample Depth (m)	0.30-0.50	0.30-0.40						
Date Sampled	20/09/06	20/09/06						
Date Scheduled	26/09/06	26/09/06						
Laboratory Reference No	174354	174356						
Analysis								
* * VOC SUITE Cont.. * *								
Toluene	< 20	< 20				071S	ug/kg	20
1,3 -Dichloropropane	< 20	< 20				071S[IM]	ug/kg	20
Dibromochloromethane	< 20	< 20				071S[IM]	ug/kg	20
1,2-Dibromoethane	< 20	< 20				071S[IM]	ug/kg	20
Tetrachloroethene	< 20	< 20				071S	ug/kg	20
1,1,1,2-Tetrachloroethane	< 10	< 10				071S	ug/kg	10
Chlorobenzene	< 20	< 20				071S[IM]	ug/kg	20
Ethyl Benzene	< 20	< 20				071S	ug/kg	20
m,p-Xylenes	< 30	< 30				071S	ug/kg	30
Bromoform	< 10	< 10				071S[IM]	ug/kg	10
Styrene	< 20	< 20				071S[IM]	ug/kg	20
o-Xylene	< 20	< 20				071S	ug/kg	20
1,1,2,2 Tetrachloroethane	< 10	< 10				071S	ug/kg	10
1,2,3-Trichloropropane	< 20	< 20				071S[IM]	ug/kg	20
Isopropylbenzene	< 20	< 20				071S[IM]	ug/kg	20
Bromobenzene	< 10	< 10				071S[IM]	ug/kg	10
n-propylbenzene	< 20	< 20				071S[IM]	ug/kg	20
2-Chlorotoluene	< 20	< 20				071S[IM]	ug/kg	20
4-Chlorotoluene	< 20	< 20				071S[IM]	ug/kg	20
1,3,5 Trimethylbenzene	< 20	< 20				071S	ug/kg	20
tert-butylbenzene	< 20	< 20				071S[IM]	ug/kg	20
1,2,4 Trimethylbenzene	< 20	< 20				071S	ug/kg	20
sec-butylbenzene	< 20	< 20				071S[IM]	ug/kg	20
1,3 Dichlorobenzene	< 20	< 20				071S	ug/kg	20
1,4 Dichlorobenzene	< 20	< 20				071S	ug/kg	20
4-Isopropyltoluene	< 20	< 20				071S[IM]	ug/kg	20
1,2 Dichlorobenzene	< 20	< 20				071S	ug/kg	20
n-butylbenzene	< 20	< 20				071S	ug/kg	20
1,2,4-Trichlorobenzene	< 20	< 20				071S	ug/kg	20

[I] ISO 17025 accredited.
[M] MCERTS accredited for sand, loam and clay.

ALcontrol Technichem
Table Of Results

Job Number : 06-21205
Matrix : Soil
Project Code: P3779

Project Name: Mill Hill Road, Hinckley
Client : Ground Risk Management Ltd

Sample Reference	WS10	WS12				Method No	Units	LOD
Sample Depth (m)	0.30-0.50	0.30-0.40						
Date Sampled	20/09/06	20/09/06						
Date Scheduled	26/09/06	26/09/06						
Laboratory Reference No	174354	174356						
Analysis								
** VOC SUITE Cont. **								
1,2-Dibromo-3-Chloropropane	< 20	< 20				071S	ug/kg	20
Hexachlorobutadiene	< 20	< 20				071S	ug/kg	20
1,2,3-Trichlorobenzene	< 20	< 20				071S	ug/kg	20

I ISO 17025 accredited.
M MCERTS accredited for sand, loam and clay.

ALcontrol Technichem
EPH Description

Matrix: Soils

Job Number: 06-21205
Client: Ground Risk Management Ltd
Project Code: P3779

Project Name: Mill Hill Road, Hinckley

Laboratory Reference No	Sample Reference	Sample Depth (m)	Date Sampled	EPH Description
174341	WS1	0.3	20/09/06	The sample chromatogram exhibits too little GC-FID amenable material to provide qualitative analysis.
174344	WS3	0.4	20/09/06	The sample chromatogram exhibits a hump of unresolved complex material eluting from C16 to C40 overlain by a series of peaks consistent with a small amount of PAHs
174347	WS5	0.60-0.80	20/09/06	The sample chromatogram exhibits a hump of unresolved complex material eluting from C16 to C40.
174349	WS6	0.50-0.60	20/09/06	The sample chromatogram exhibits a hump of unresolved complex material eluting from C16 to C40.
174351	WS8	0.40-0.60	20/09/06	The sample chromatogram exhibits a trace consistent with a diesel standard.
174353	WS8	4.70-5.00	20/09/06	The sample chromatogram exhibits too little GC-FID amenable material to provide qualitative analysis.
174354	WS10	0.30-0.50	20/09/06	The sample chromatogram exhibits too little GC-FID amenable material to provide qualitative analysis.
174356	WS12	0.30-0.40	20/09/06	The sample chromatogram exhibits too little GC-FID amenable material to provide qualitative analysis.

ALcontrol Technichem
EPH Description

Matrix: Soils
Project Name: Mill Hill Road, Hinckley

Job Number: 06-21205
Client: Ground Risk Management Ltd
Project Code: P3779

Laboratory Reference No	Sample Reference	Sample Depth (m)	Date Sampled	EPH Description
174359	WS14	2.60-2.80	20/09/06	The sample chromatogram exhibits a hump of unresolved complex material eluting from C16 to C30.
174360	WS15	2.70-3.00	20/09/06	The sample chromatogram exhibits a hump of unresolved complex material eluting from C16 to C30.

ALcontrol Technichem
Table Of Results - Appendix

Job Number : 06-21205

Project Code: P3779

Project Name: Mill Hill Road, Hinckley
Client : Ground Risk Management Ltd

Summary of methods contained within report :

Method No.	Reference	Description	Wet/Dry Analysis
071S	In-house method based on EPA624 "Volatile Organic Compounds in Soils/Sludges"	Determination of volatile organic compounds in soil samples by headspace GC-MS	W
070S	In-house method	Determination of hexane/acetone extractable hydrocarbons in soil by gas chromatography with flame ionisation detection. Note: UKAS accreditation only applies to C10-C40 and excludes other carbon banding.	W
061S	In-house method based on Method 4500-CN, "Standard Methods for the Examination of Water and Waste Water", APHA AWWA WEF, Edition 18, 1992	Determination of cyanides and thiocyanate in soil samples by continuous flow colorimetry (Skalar)	W
022S	In-house method	Determination of PAH compounds in soil samples by hexane / acetone extraction followed by GC-MS detection	W
020S	In-house method based on Second Site Property: Environmental Assessment Guidance Version 3: March 2003	Determination of methanol/water extractable phenols in soil samples by HPLC with electrochemical detection	W
009S	In-house method referencing BS1377: Part 3: 1990 and Second Site Property: Environmental Assessment Guidance Version 3: March 2003	Determination of pH by addition of water followed by electrometric measurement	W
CWGS	In-house method based on "Total Petroleum Hydrocarbon Criteria Working Group" series, 1998-9	Determination of "CWG" banded petroleum hydrocarbons in soil samples using a combination of headspace GC-FID (C5-C12) and hexane:acetone extraction / silica-alumina aliphatic - aromatic split / GC-FID (C12-C35) techniques with banding by comparison to alkane standards	W
074	In-house method based on BS1377 Part 3, "Chemical and Electrochemical Tests", 1990	Determination of 2:1 water soluble sulphate in soil samples by Inductively Coupled Plasma - Optical Emission Spectrometry (ICP-OES)	D
069S	In-house method based on MEWAM "Methods for the Determination of Metals in Soil", HMSO, 1986	Determination of metals in soil samples by aqua-regia digestion followed by ICP-OES detection	D

ALcontrol Technichem
Table Of Results - Appendix

Job Number : 06-21205

Project Code: P3779

Project Name: Mill Hill Road, Hinckley
Client : Ground Risk Management Ltd

Summary of methods contained within report :

Method No.	Reference	Description	Wet/Dry Analysis
016S	In-house method	Determination of water soluble boron by 2:1 extraction in hot water followed by ICP-OES detection	D
092	In-house method	Determination of organic matter in soil samples by combustion analyser	D

Soil results are expressed on a dry weight basis. Where the test uses as-received sample, a moisture correction factor is applied to the wet weight result. This factor is **determined gravimetrically using weight loss on drying at 30° (+/-5) C.**

APPENDIX I

GRM Development Solutions
geoenvironmental - civil - structural

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BUREAU VERITAS

UKAS TESTING
0199

TEST REPORT

Report No: 50118123/06/1
Our Ref: DAM0007677

Client

Ground Risk Management Limited
Bretby Business Park
Ashby Road
Burton-Upon-Trent
Staffordshire
DE15 0YZ

RECE
9 OCT 20[illegible]

Test Report

Site: Mill Hill Road, Hinckley

Test Requested: Determination of Moisture Content, Atterberg Limits, Sulphate Content and pH Value

Test Method: BS 1377-2: 1990: Method 3.2, 4.4 and 5
BS 1377-3: 1990: Method 5 and 9

Sample Details:

Sampled by:	Client
Date Received:	27.09.06
Tested From:	27.09.06 to 03.10.06

Results: See attached sheets

Date: 04.10.06

Signed: [illegible]

[ ] J. Cross - Section Manager
[ ] D. Goddard - Laboratory Manager

For and on behalf of Bureau Veritas Laboratories
a trading division of Bureau Veritas B&I Ltd

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BUREAU VERITAS

UKAS TESTING 3199

TEST REPORT

Determination of Moisture Content and Atterberg Limits

Client: Ground Risk Management Limited
Site: Mill Hill Road, Hinckley

Report No: 50118123/06/1

Laboratory Reference	Location	Depth (m)	Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	% Retained 425µm BS Test Sieve (Estimated)
[redacted]035795	WS10	1.40-1.60	19	32	14	18	0
45035796	WS11	0.95-1.25	22	51	21	30	0
45035797	WS12	0.50-0.60	20	57	21	36	0
45035798	WS13	2.60-2.80	19	29	15	14	0

Comments: Sample Type Disturbed

Sample Preparation: Natural

[redacted]

45035795 Soft brown sandy CLAY
45035796 Soft brown sandy CLAY
45035797 Soft brown CLAY
45035798 Very soft brown SILT/CLAY

Certified that the laboratory testing was carried out in accordance with BS 1377-2: 1990: Method 3.2, 4.4 and 5

Date: 04.10.06

Signed: _____

[✓] J. Cross - Section Manager
[ ] D. Goddard - Laboratory Manager

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BUREAU VERITAS

UKAS TESTING 0199

TEST REPORT

Determination of Sulphate Content and pH Value

Client: Ground Risk Management Limited
Site: Mill Hill Road, Hinckley

Report No: 50118123/06/1

Laboratory Reference	Location	Depth (m)	% Passing 2mm BS Test Sieve	pH Value	Water Soluble Sulphate Content (g/l)
45035791	WS1	1.70-1.80	100	8.4	0.09
45035792	WS5	2.85-2.95	97	7.8	0.05
45035793	WS6	4.80-5.00	99	8.5	0.04
45035794	WS7	4.30-4.70	100	8.4	0.12
45035795	WS10	1.40-1.60	98	7.7	0.02
45035796	WS11	0.95-1.25	99	8.6	0.06
45035798	WS13	2.60-2.80	84	8.2	0.04

Comments: Sulphate Content expressed as SO_4

Certified that the laboratory testing was carried out in accordance with BS 1377-3: 1990: Method 5 and 9
Tested by UKAS laboratory No. 187

Page: 3 of 3
Date: 04.10.06

Signed: _____

[✓] J. Cross - Section Manager
[ ] D. Goddard - Laboratory Manager

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Address:	Bretby Business Park Ashby Road Burton On Trent Staffs DE15 0YZ	**Our Contract Ref:**	50118123
		Your Ref:	P3779
		Report Date:	04 October 2006

Client Contact: Not Given

Site: **Mill Hill Rd, Hinkley**

Test Requested: **Determination of pH value and Water Soluble Sulfate Content**

Test Method: BS 1377-3:1990 Test Nos. 9 and 5.5

Sample Details:

Sampled by:	Client
Date Sampled:	25 September 2006
Samples submitted by:	Daventry Laboratory
Certificate of Sampling received:	No
Date Received:	26 September 2006
Date Tested:	29 September - 04 October 2006

Results: See attached sheet

Certified that the pH value and Water Soluble Sulfate Content were determined in accordance with BS 1377-3: 1990

Signed: L Eyers

Les Eyers - Section Manager - Chemistry
for and on behalf of Bureau Veritas Laboratories

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BUREAU VERITAS

Client: -GROUND RISK MANAGEMENT **Report No.** MDM/DAM0007677/1
Site: Mill Hill Rd, Hinkley **Report Date:** 04 October 2006

RESULTS SUMMARY

Sample Reference		45035791	45035792	45035793	45035794	45035795	45035796
Client's Reference		WS1	WS5	WS6	WS7	WS10	WS11
Location		Not Given	Not Given	Not Given	Not Given	Not Given	Not Given
Depth	(m)	1.70-1.80	2.85-2.95	4.80-5.00	4.30-4.70	1.40-1.60	0.95-1.25
Percentage of material passing 2mm BS test sieve	(%)	100	97	99	100	98	99
Water soluble sulfate content of material passing 2mm sieve;-							
expressed as SO_3	(g/L)	0.08	0.04	0.03	0.10	0.02	0.05
expressed as SO_4	(g/L)	0.09	0.05	0.04	0.12	0.02	0.06
expressed as SO_4	(mg/L)	90	50	40	120	20	60
pH value		8.4	7.8	8.5	8.4	7.7	8.6

----------CONTINUED ON NEXT SHEET----------

Approved:

Client:	GROUND RISK MANAGEMENT	**Report No.**	DM/DAM0007677/1
Site:	Mill Hill Rd, Hinkley	**Report Date:**	04 October 2006

RESULTS SUMMARY

Sample Reference		45035798
Client's Reference		WS13
Location		Not Given
Depth	(m)	2.60-2.80
Percentage of material passing 2mm BS test sieve	(%)	84
Water soluble sulfate content of material passing 2mm sieve;-		
expressed as SO_3	(g/L)	0.03
expressed as SO_4	(g/L)	0.04
expressed as SO_4	(mg/L)	40
pH value		8.2

----------CONTINUED ON NEXT SHEET----------

Approved:

Client: GROUND RISK MANAGEMENT **Report No.** MDM/DAM0007677/1
Site: Mill Hill Rd, Hinkley **Report Date:** 04 October 2006

Visual Description	
Sample Reference	Description
45035791	Brown SAND
45035792	Brown sandy CLAY
45035793	Brown sandy CLAY
45035794	Brown sandy CLAY
45035795	Brown sandy CLAY
45035796	Brown CLAY
45035798	Brown sandy CLAY

----------END OF TEST REPORT----------

Approved:

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BUREAU VERITAS

UKAS TESTING 0199

TEST REPORT

Determination of Sulphate Content and pH Value

Client: Ground Risk Management Limited
Site: Mill Hill Road, Hinckley

Report No: 50118123/06/1

Laboratory Reference	Location	Depth (m)	% Passing 2mm BS Test Sieve	pH Value	Water Soluble Sulphate Content (g/l)
45035791	WS1	1.70-1.80			
45035792	WS5	2.85-2.95			
45035793	WS6	-			
45035794	WS7	-			
45035795	WS10	1.40-1.60			
45035796	WS11	0.95-1.25			
45035797	WS12	0.50-0.60			
45035798	WS13	2.60-2.80			

Comments: Sulphate Content expressed as SO_4

Certified that the laboratory testing was carried out in accordance with BS 1377-3: 1990: Method 5 and 9
Tested by UKAS laboratory No. 187

Page: 3 of 3
Date: 04.10.06

Signed: _____

[ ] J. Cross - Section Manager
[ ] D. Goddard - Laboratory Manager

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APPENDIX J

GRM Development Solutions
geoenvironmental - civil - structural

CONTAMINANTS	CLEA SGVs**			
	Resi with plants	Resi w/out plants	Allotments	Comm/Ind
Arsenic	20	20	20	500
Cadmium*	*6 7 8* 1 2 8	30	*6 7 8* 1 2 8	1400
Chromium (hexavalent) Chromium (total)	130	200	130	5000
Lead	450	450	450	750
Mercury	8	15	8	480
Selenium	35	260	35	8000
Nickel	50	75	50	5000
Ethylbenzene***	*1 2.5 5* 9 21 41	*1 2.5 5* 16 41 80	*1 2.5 5* 18 43 85	*1 2.5 5* 48,000
Toluene***	*1 2.5 5* 3 7 14	*1 2.5 5* 3 8 15	*1 2.5 5* 31 73 140	*1 2.5 5* 150 350 680
Phenols***	1 2.5 5 78 150 280	1 2.5 5 21.9 34.4 37.3	1 2.5 5 80 155 280	1 2.5 5 21.9 43 78.1
	GRM GENERIC ASSESSMENT CRITERIA			
Boron (water soluble)	6,550	6,781	6,432	164,988
Copper	2,806	3,092	2,860	74,626
Zinc	21,432	22,149	21,334	550, 592
PAH	As Per Individual Determinand			
Free Cyanide	15.85	135	15	14,149
	GRM GENERIC ASSESSMENT CRITERIA (PAHs)			
Acenaphthene	440	4,490	607	3,700
Acenaphthylene	475	1,531	599	5,200
Anthracene	3,450	10,800	4,020	70,000
Benzo(a)anthracene	2.900	4.840	3.800	31.70
Benzo(a)pyrene	0.847	0.855	1.000	9.00
Benzo(b)fluoranthene	5.77	9.85	6.40	96.00
Benzo(ghi)perylene	508	1,047	602	8,150
Benzo(k)fluoranthene	3.8	6.7	4.6	48.0
Chrysene	220	446	271	2,920
Dibenzo(ah)anthracene	0.485	0.846	0.439	7.00
Fluoranthene	420	824	370	5,300
Fluorene	490	1,435	485	6,775
Ideno(1,2,3-cd)pyrene	6.23	8.67	5.40	72.00
Napthalene	49	69	160	158
Phenanthrene	420	1,020	390	6,870
Pyrene	640	713	520	4,730

Revised 31/03/06

All GRM Generic Assessment Criteria are calculated using CLEA 2002 Defaults

All figures are in mg/kg

Due to the lack of relevant toxicity data, the published Index Dose for BaP has been used as a baseline figure. This has been adjusted according to the respective Toxic Equivalent factors (where BaP=1). Data sourced from USEPA (1993) Provisional Guidance for QRA of PAH. EPA/600/R-93/089.

NL: No Limit

* Cd values linked to *pH* of respective sample

**Ref: The Environment Agency R&D Publications SGV1-9 March 2002

*** SGV's linked to Soil Organic Matter (SOM) content of sample. SGV's assume that free phase is not present.

SGV's for Phenols (Resi w/out & Comm/ind) are x 1000

TIER 1 PETROLEUM HYDROCARBONS				
CONTAMINANTS	GRM GENERIC ASSESSMENT CRITERIA			
	Resi with plants	Resi w/out plants	Allotments	Comm/Ind
ALIPHATICS				
C6-C8	10	125	50,000	75
C8-C10	1	1	3000	2
C10-C12	5	5	5000	10
C12-C16	25	25	6000	50
C16-C21	7500	8000	125,000	17,500
C21-C35	5000	5250	125,000	12,000
AROMATICS				
C8-C10	3	3	1725	7.5
C10-C12	20	20	2000	45
C12-C16	100	100	2000	200
C16-C21	725	725	1750	2250
C21-C35	2000	2000	2000	45,000
BENZENE	0.007	0.007	0.090	0.010
XYLENE*	10	10	450	20

Revised 11/07/05

All GRM Generic Assessment Criteria are calculated using the CLEA 2002 Defaults

All figures are in mg/kg

* Xylene Mixture

UK Drinking Water Standards (UKDWS)

Parameter	Concentration	Units
Acrylamide	0.1	µg/l
Aluminium	200	µgAl/l
Ammonium	0.5	mgNH4/l
Antimony	5	µgSb/l
Arsenic	10	µgAs/l
Benzene	1	µg/l
Benzo(a)pyrene	0.01	µg/l
Boron	1	mgB/l
Bromate	10	µgBrO3/l
Cadmium	5	µgCd/l
Chromium	50	µgCr/l
Chloride (i)	250	mgCl/l
Conductivity (i)	2500	µS/cm at 20°C
Copper(ii)	2	mgCu/l
Cyanide	50	µgCN/l
1, 2 dichloroethane	3	µg/l
Epichlorohydrin	0.1	µg/l
Fluoride	1.5	mgF/l
Hydrogen ion	10	pH value
Iron	200	µgFe/l
Lead (ii)	25	µgPb/l
Manganese	50	µgMn/l
Mercury	1	µgHg/l
Mineral Oil (TPH)	10	µg/l
Nickel (ii)	20	µgNi/l
Nitrate (iii)	50	mgNO3/l
Nitrite (iii)	0.5	mgNO2/l
Phenol	0.5	µg/l
Polycyclic aromatic hydrocarbons (vii)	0.1	µg/l
Selenium	10	µgSe/l
Sodium	200	mgNa/l
Sulphate (i)	250	mgSO4/l
Tetrachloroethene and Trichloroethene (viii)	10	µg/l
Tetrachloromethane	3	µg/l
Trihalomethanes: Total (ix)	100	µg/l
Vinyl chloride	0.5	µg/l
Zinc	5000	µg/l

Pesticides		
Aldrin	0.03	µg/l
Dieldrin	0.03	µg/l
Heptachlor	0.03	µg/l
Heptachlor epoxide	0.03	µg/l
other pesticides	0.1	µg/l
Pesticides: Total (vi)	0.5	µg/l

Ref: UK Water Supply (Water Quality) Regulations 2000

Environmental Quality Standards (EQS) Groundwater Thresholds for List 1 & 2 Substances

Table 1: Environmental Quality Standards (EQS) for List 1 Dangerous Substances

Substance	All Freshwater EQS (ug/l)
Mercury	1
Cadmium	5
Hexachlorocyclohexane	0.1
Carbon tetrachloride	12
Total DDT	0.025
pp DDT	0.01
Pentachlorophenol	2
Dieldrin	0.01
Isodrin	0.005
Aldrin	0.01
Endrin	0.005
Total Drins	0.03
Hexachlorobenzene	0.03
Hexachlorobutadiene	0.1
Chloroform	12
1,2-dichloroethane	10
Trichlorethylene	10
Perchlorethylene	10
Trichlorobenzene	0.4

Table 2a: Environmental Quality Standards (EQS) for List 2 Dangerous Substances

Substance	EQS Type	All Freshwater EQS (ug/l)	Substance	EQS Type	All Freshwater EQS (ug/l)
1,1,1-Trichloroethane	Annual average	100	Fenitrothion	Annual average	0.01
1,1,2-Trichloroethane	Annual average	400	Flucofuron	95 percentile	1
2,4-D (ester)	Annual average	1	Iron (dissolved)	Annual average	1000
2,4-D (non-ester)	Annual average	40	Lead (dissolved)	Annual average	Hardness related (see table 2b for details)
2,4-Dichlorophenol	Annual average	20	Linuron	Annual average	2
2-Chlorophenol	Annual average	50	Malathion	Annual average	0.01
4-Chloro-3-methyl-phenol	Annual average	40	Mecoprop	Annual average	20
Arsenic (dissolved)	Annual average	50	Mevinphos	Maximum concentration	0.02
Atrazine & Simazine	Annual average	2	Naphthalene	Annual average	10
Azinphos-methyl	Annual average	0.01	Nickel (dissolved)	Annual average	Hardness related (see table 2b for details)
Bentazone	Annual average	500	Omethoate	Annual average	0.01
Benzene	Annual average	30	PCSDs	95th percentile	0.05
Biphenyl	Annual average	25	Permethrin	95th percentile	0.01
Boron (dissolved)	Annual average	2000	pH	95th percentile	06-Sep
Chloronitrotoluenes	Annual average	10	Sulcofuron	95th percentile	25
Chromium (dissolved)	Annual average	Hardness related (see table 2b for details)	Toluene	Annual average	50
Copper (dissolved)	Annual average	Hardness related (see table 2b for details)	Triazaphos	Annual average	0.005
Cyfluthrin	95th percentile	0.001	Tributyltin	Maximum concentration	0.02
Demeton	Annual average	0.5	Trifluralin	Annual average	0.1
Dichlorvos	Annual average	0.001	Triphenyltin	Maximum concentration	0.02
Dichlorvos	Maximum concentration	-	Vanadium (dissolved)	Annual average	Hardness related (see table 2b for details)
Dimethoate	Annual average	1	Xylene (m and p, o)	Annual average	30
Endusulphan	Annual average	0.003	Zinc (total)	Annual average	Hardness related (see table 2b for details)
Ammonia (as NH3)		15			

Table 2b: Environmental Quality Standards (EQS) for hardness related List 2 dangerous substances

Substance	EQS type	EQS (ug/l) for Hardness bands (mg/l CaCO3) 0-50	>50-100	>100-150	>150-200	>200-250	>250
Freshwaters, suitable for all fishlife							
Copper (dissolved)	Annual average	1	6	10	10	10	28
Copper (dissolved)	95th percentile	5	22	40	40	40	112
Nickel (dissolved)	Annual average	50	100	150	150	200	200
Vanadium (dissolved)	Annual average	20	20	20	20	60	60
Freshwaters, suitable for Salmonid (game) fish							
Chromium (dissolved)	Annual average	5	10	20	20	50	50
Lead (dissolved)	Annual average	4	10	10	20	20	20
Zinc (total)	Annual average	8	50	75	75	75	125
Zinc (total)	95th percentile	30	200	300	300	300	500
Freshwaters, suitable for Cyprinid (coarse) fish							
Chromium (dissolved)	Annual average	150	175	200	200	250	250
Lead (dissolved	Annual average	20	125	125	250	250	250
Zinc (total)	Annual average	75	175	250	250	250	500
Zinc (total)	95th percentile	300	700	1000	1000	1000	2000

Revised 31/03/06

Contaminant Thresholds for Subsurface Water Pipes

Contaminant	Material selection Threshold Level (mg/kg dried soil)
Corrosion	
Sulphate (SO4)	2000
Sulphur (S)	5000
Sulphide (S)	250
pH	<pH5, >pH8
Toxic Substances	
Antimony (Sb)	10
Arsenic (As)	10*
Cadmium (Cd)	3
Chromium (hexavalent) (Cr)	25
Chromium (total)	600
Cyanide (free) (Cn)	25*
Cyanide (complexed) (Cn)	250*
Lead (Pb)	500
Mercury (Hg)	1
Selenium (Se)	3
Thiocyanate (SCN)	50
Organic Contaminants	
Coal Tar	50
Cyclohexane extractable	50
Phenol	5
Poly Aromatic Hydrocarbons	50
Toluene extractable	50
TPH DRO (diesel, kerosene)	100
Petrol	10
Mineral oils	1000

* It is not recommended that water pipes should be laid in sites where these substances are identified or suspected

Ref: Water Regulations Advisory Scheme (WRAS) (No. 9-04-03 Issue 1)

APPENDIX K

GRM Development Solutions
geoenvironmental - civil - structural

GRM Statistical Analysis Methodology

Chemical analysis has been carried out on representative soil samples from within the subject site.

Statistical analysis in line with the current guidance given in R&D publication CLR 7 (Assessment of Risks to Human Health from Land Contamination: An overview of the Development of Soil Guideline Values and Related Research) has been carried out. These spreadsheets show the results of this analysis (sheet v1a and sheet v1b).

The mean value test has been carried out to identify the Upper 95 percentile (US95) of the distribution curve calculated from the test results available. This value is compared with the relevant standards threshold/guidance level, i.e. CLEA SGV or GRM GAC. The lower bound value (lower 95 percentile) for the pH results is used to calculate the cadmium SGV relevant to the site.

The maximum value test has also been carried out to identify if the contamination results are consistent with the calculated distribution curve or whether the data set contains an outlier (hotspot).

Where the maximum value test has a similar distribution, i.e. does not contain any outliers, and the calculated US95 is below the relevant action level then the risk posed to the end user is considered to be acceptable.

Where the maximum value test has a similar distribution, i.e. does not contain any outliers, and the calculated US95 is above the relevant action level then the contaminant poses a risk to the end user which needs to be assessed. Once the risk has been assessed then either remediation or further investigation to better quantify the risk needs to be carried out.

Sheet V1a is for all of the data available to determine the presence of outliers. Contaminants, which do not have a similar distribution, are highlighted. Also highlighted are those contaminants which do have a similar distribution and whose US95 exceeds the relevant action level.

If an outlier of contamination is identified then this area requires either further investigation or special remedial actions. For contaminants with hotspots then the outlier data is removed and the statistical analysis recalculated. This is done to obtain a representative value for the majority of the site. Sheet v1b shows the results of the statistical analysis with the identified outliers (hotspots) removed.

Where significantly different types of made ground are present, i.e. from different sources, the analysis is carried out for each type to better quantify the risks posed.

GRM
geoenvironmental - civil

Project No:	P3779				Land Use: 1 = Residential with domestic gardens 2 = Residential w/out domestic gardens 3 = Allotments 4 = Comm/Ind						
Project Name:	Mill Hill Road, Hinckley Western Area										
Land Use:	1				Other Details:						
Run Number:	v1a General		Date:	12/10/2006							
Threshold Values mg/kg:	20.00	4.46	130.00	2806.00	8.00	50.00	2.65	35.00	21432.00	78.00	5.00
Ref for threshold values:	CLEA	CLEA	CLEA	GAC	CLEA	CLEA	CLEA	CLEA	GAC	GAC	GAC
Sample Number	Sample Identity	Depth (m)	Arsenic	Cadmium	Chromium	Copper	Mercury	Nickel	Lead	Selenium	Zinc	Phenols	pH
	WS10	0.30/0.50	9.50	<0.5	22.00	21.00	0.50	19.00	51.00	<1	72.00	<0.1	7.50
	WS11	0.20/0.40	13.00	0.60	31.00	31.00	0.50	30.00	460.00	<1	110.00	<0.1	8.90
	WS12	0.30/0.40	12.00	0.50	22.00	38.00	9.40	23.00	86.00	<1	81.00	<0.1	7.80
	WS13	0.08/1.50	17.00	1.00	29.00	84.00	0.40	33.00	270.00	<1	470.00	<0.1	10.80
	WS14	0.12/0.30	7.40	<0.5	23.00	43.00	0.30	49.00	72.00	<1	100.00	<0.1	10.00
Mean			11.78	0.62	25.40	43.40	2.22	30.80	131.43	1.00	166.60	0.10	9.00
Standard Deviation			3.65	0.22	4.28	24.15	4.01	11.58	175.60	0.00	170.27	0.00	1.41
No of samples			5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Value of t			2.132	2.132	2.132	2.132	2.132	2.132	2.132	2.132	2.132	2.132	2.132
US_{95}			15.26	0.83	29.48	66.43	6.05	41.85	2.51	1.00	328.95	0.10	7.66
Mean y			1.05	-0.22	1.40	1.59	-0.11	1.47	2.12	0.00	2.10	-1.00	0.95
Standard Deviation y			0.14	0.13	0.07	0.22	0.61	0.16	0.41	0.00	0.33	0.00	0.07
y_{max}			1.23	0.00	1.49	1.92	0.97	1.69	2.66	0.00	2.67	-1.00	1.03
T			1.29	1.73	1.28	1.51	1.77	1.43	1.33	0.00	1.74	0.00	1.23
T_{crit}			1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
Mean Value Test			Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Maximum Value Test			Similar Distribution	**Not Similar Distribution**	Similar Distribution	Similar Distribution	**Not Similar Distribution**	Similar Distribution	Similar Distribution	Similar Distribution	**Not Similar Distribution**	Similar Distribution	Similar Distribution

Notes The US95 value for pH relates to the lower bound value and is used for the calculation of the cadmium SGV
The Mean Value Test for lead is calculated using the arithmetic mean of the log of the test results
The Threshold and US95 values for lead are reported as log values in accordance with CLR guidance

Project No:		**P3779**						*Land Use:*	*1 = Residential with domestic gardens*				*3 = Allotments*					
Project Name:		**Mill Hill Road, Hinckley Western Area**							*2 = Residential w/out domestic gardens*				*4 = Comm/Ind*					
Land Use:		**1**						*Other Details:*										
Run Number:		**v1a PAH**		**Date:**	12/10/2006													
Threshold Values mg/kg:		440.00	475.00	3450.00	2.90	0.85	5.77	508.00	3.80	220.00	0.49	420.00	490.00	6.23	49.00	420.00	640.00	
Ref for threshold values:		GAC	GAC	GAC	GAC	GAC	GAC	GAC	GAC	GAC	GAC	GAC	GAC	GAC	GAC	GAC	GAC	
Sample Number	**Sample Identity**	**Depth (m)**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo(a) anthracene**	**Benzo(a) pyrene**	**Benzo(b) fluoranthene**	**Benzo(ghi) perylene**	**Benzo(k) fluoranthene**	**Chrysene**	**Dibenzo(ah) anthracene**	**Fluoranthene**	**Fluorene**	**Ideno(1,2,3-cd) pyrene**	**Napthalene**	**Phenanthrene**	**Pyrene**
	WS10	0.30/0.50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	WS11	0.20/0.40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	WS12	0.30/0.40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	WS13	0.08/1.50	<0.1	<0.1	0.17	0.46	0.57	0.59	0.42	0.40	0.51	0.12	1.00	<0.1	0.37	0.15	0.63	0.85
	WS14	0.12/0.30	<0.1	<0.1	<0.1	<0.1	<0.1	0.11	<0.1	<0.1	<0.1	<0.1	0.14	<0.1	<0.1	<0.1	0.14	0.13
Mean			0.10	0.10	0.11	0.17	0.19	0.20	0.16	0.16	0.18	0.10	0.29	0.10	0.15	0.11	0.21	0.26
Standard Deviation			0.00	0.00	0.03	0.16	0.21	0.22	0.14	0.13	0.18	0.01	0.40	0.00	0.12	0.02	0.23	0.33
No of samples			5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Value of t			2.132	2.132	2.132	2.132	2.132	2.132	2.132	2.132	2.132	2.132	2.132	2.132	2.132	2.132	2.132	2.132
US_{95}			0.10	0.10	0.14	0.33	0.39	0.41	0.30	0.29	0.36	0.11	0.67	0.10	0.27	0.13	0.44	0.57
Mean y			-1.00	-1.00	-0.95	-0.87	-0.85	-0.84	-0.88	-0.88	-0.86	-0.98	-0.77	-1.00	-0.89	-0.96	-0.81	-0.79
Standard Deviation y			0.00	0.00	0.10	0.30	0.34	0.34	0.28	0.27	0.32	0.04	0.44	0.00	0.25	0.08	0.35	0.41
y_{max}			-1.00	-1.00	-0.77	-0.34	-0.24	-0.23	-0.38	-0.40	-0.29	-0.92	0.00	-1.00	-0.43	-0.82	-0.70	0.07
T			0.00	0.00	1.79	1.79	1.79	1.79	1.79	1.79	1.79	1.79	1.77	0.00	1.79	1.79	1.76	1.78
T_{crit}			1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
Mean Value Test			Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Maximum Value Test			Similar Distribution	Similar Distribution	**Not Similar Distribution**	**Not Similar Distribution**	**Not Similar Distribution**	**Not Similar Distribution**	**Not Similar Distribution**	**Not Similar Distribution**	**Not Similar Distribution**	**Not Similar Distribution**	**Not Similar Distribution**	Similar Distribution	**Not Similar Distribution**	**Not Similar Distribution**	**Not Similar Distribution**	**Not Similar Distribution**

Project No:	P3779				Land Use: 1 = Residential with domestic gardens				3 = Allotments		
Project Name:	Mill Hill Road, Hinckley Eastern Area				2 = Residential w/out domestic gardens				4 = Comm/Ind		
Land Use:	1				Other Details:						
Run Number:	v1a General		Date:	17/10/2006							
Threshold Values mg/kg:	20.00	1.10	130.00	2806.00	8.00	50.00	2.65	35.00	21432.00	78.00	5.00
Ref for threshold values:	CLEA	CLEA	CLEA	GAC	CLEA	CLEA	CLEA	CLEA	GAC	GAC	GAC

Sample Number	Sample Identity	Depth (m)	Arsenic	Cadmium	Chromium	Copper	Mercury	Nickel	Lead	Selenium	Zinc	Phenols	pH
	WS1	0.30	8.80	<0.5	23.00	20.00	0.60	19.00	33.00	<1	71.00	<0.1	7.70
	WS2	0.30/0.40	10.00	0.60	23.00	34.00	0.70	24.00	97.00	<1	170.00	<0.1	6.00
	WS3	0.40	14.00	0.80	30.00	50.00	0.70	31.00	110.00	<1	120.00	<0.1	6.90
	WS4	0.10/0.20	14.00	0.70	26.00	45.00	0.70	27.00	130.00	<1	130.00	<0.1	7.80
	WS5	0.60/0.80	13.00	0.50	25.00	28.00	0.60	27.00	55.00	<1	94.00	<0.1	8.40
	WS6	0.50/0.60	12.00	0.60	26.00	24.00	0.60	28.00	36.00	<1	93.00	<0.1	8.50
Mean			11.97	0.62	25.50	33.50	0.65	26.00	67.02	1.00	113.00	0.10	7.55
Standard Deviation			2.16	0.12	2.59	11.90	0.05	4.10	40.98	0.00	34.96	0.00	0.95
No of samples			6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Value of t			2.015	2.015	2.015	2.015	2.015	2.015	2.015	2.015	2.015	2.015	2.015
US_{95}			13.74	0.71	27.63	43.29	0.70	29.37	2.04	1.00	141.76	0.10	6.77
Mean y			1.07	-0.22	1.40	1.50	-0.19	1.41	1.83	0.00	2.04	-1.00	0.87
Standard Deviation y			0.08	0.08	0.04	0.16	0.04	0.07	0.26	0.00	0.13	0.00	0.06
y_{max}			1.15	-0.10	1.48	1.70	-0.15	1.49	2.11	0.00	2.23	-1.00	0.93
T			0.90	1.48	1.69	1.27	0.91	1.11	1.12	0.00	1.46	0.00	0.95
T_{crit}			1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Mean Value Test			Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Maximum Value Test			Similar Distribution	Similar Distribution	Similar Distribution	Similar Distribution	Similar Distribution	Similar Distribution	Similar Distribution	Similar Distribution	Similar Distribution	Similar Distribution	Similar Distribution

Notes The US95 value for pH relates to the lower bound value and is used for the calculation of the cadmium SGV
The Mean Value Test for lead is calculated using the arithmetic mean of the log of the test results
The Threshold and US95 values for lead are reported as log values in accordance with CLR guidance

Project No:	P3779						*Land Use:* 1 = Residential with domestic gardens 3 = Allotments											
Project Name:	Mill Hill Road, Hinckley Eastern Area						2 = Residential w/out domestic gardens 4 = Comm/Ind											
Land Use:	1						*Other Details:*											
Run Number:	v1a PAH		**Date:**	12/10/2006														
Threshold Values mg/kg:	440.00	475.00	3450.00	2.90	0.85	5.77	508.00	3.80	220.00	0.49	420.00	490.00	6.23	49.00	420.00	640.00		
Ref for threshold values:	GAC	GAC	GAC	GAC	GAC	GAC	GAC	GAC	GAC	GAC	GAC	GAC	GAC	GAC	GAC	GAC		
Sample Number	**Sample Identity**	**Depth (m)**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo(a) anthracene**	**Benzo(a) pyrene**	**Benzo(b) fluoranthene**	**Benzo(ghi) perylene**	**Benzo(k) fluoranthene**	**Chrysene**	**Dibenzo(ah) anthracene**	**Fluoranthene**	**Fluorene**	**Ideno(1,2,3-cd) pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**
	WS1	0.30	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	WS2	0.30/0.40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.13	<0.1	0.20	<0.1	<0.1	<0.1	0.30	0.17
	WS3	0.40	<0.1	<0.1	0.16	0.45	0.38	0.34	0.19	0.41	0.66	<0.1	1.20	<0.1	0.17	<0.1	0.84	1.00
	WS4	0.10/0.20	0.40	<0.1	0.88	1.40	1.00	0.87	0.47	1.10	1.70	<0.1	4.40	0.34	0.43	<0.1	<0.1	3.70
	WS5	0.60/0.80	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	WS6	0.50/0.60	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mean			0.15	0.10	0.24	0.38	0.30	0.27	0.18	0.32	0.47	*0.10*	1.02	0.14	0.17	0.10	0.14	0.86
Standard Deviation			0.12	0.00	0.31	0.52	0.36	0.31	0.15	0.40	0.64	0.00	1.71	0.10	0.13	0.00	0.10	1.43
No of samples			6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Value of t			2.015	2.015	2.015	2.015	2.015	2.015	2.015	2.015	2.015	2.015	2.015	2.015	2.015	2.015	2.015	2.015
US_{95}			0.25	0.10	0.50	0.80	0.59	0.52	0.30	0.65	0.99	0.10	2.43	0.22	0.28	0.10	0.22	2.04
Mean y			-0.90	-1.00	-0.81	-0.70	-0.74	-0.75	-0.84	-0.72	-0.64	-1.00	-0.50	-0.91	-0.86	-1.00	-0.91	0.53
Standard Deviation y			0.25	0.00	0.38	0.49	0.43	0.40	0.28	0.45	0.53	0.00	0.70	0.22	0.26	0.00	0.22	0.66
y_{max}			-0.40	-1.00	-0.06	0.15	0.00	-0.06	-0.33	0.04	0.23	-1.00	0.64	-0.47	-0.37	-1.00	-0.47	0.57
T			2.04	0.00	1.99	1.73	1.72	1.73	1.87	1.71	1.63	0.00	1.63	2.04	1.91	0.00	2.04	1.66
T_{crit}			1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Mean Value Test			Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Maximum Value Test			**Not Similar Distribution**	Similar Distribution	**Not Similar Distribution**	Similar Distribution	Similar Distribution	**Not Similar Distribution**	**Not Similar Distribution**	Similar Distribution	Similar Distribution	Similar Distribution	Similar Distribution	**Not Similar Distribution**	**Not Similar Distribution**	Similar Distribution	**Not Similar Distribution**	Similar Distribution