NICHOLLS COLTON
GEOTECHNICAL

PRELIMINARY CONTAMINATION ASSESSMENT

FOR

NICHOLAS MARKS



at

Unit 6,
Merrylees Industrial Estate,
Desford,
Leicestershire.

REPORT NO: G11149 **DECEMBER 2011**

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G11149/01	Site Location Plan
G11149/02	Exploratory Hole Location Plan

PRELIMINARY CONTAMINATION ASSESSMENT FOR UNIT 6, MERRYLEES INDUSTRIAL ESTATE, DESFORD, LEICESTER.

1. Introduction

1.1 This report has been prepared on instructions given by Mr N. O'Donnell, Nicholas Marks, Merrylees Industrial Estate, Heath Road, Desford, Leicester, LE9 9FE.

1.2 It is understood that Mr N. O'Donnell proposes to erect a portal frame unit at the site. It is understood that the industrial unit will be used as a joinery manufacturing workshop.

1.3 The purpose of this investigation was to obtain and summarise desk study information regarding the history and environmental status of the site. As a part of this work, a preliminary assessment of soil contamination has been carried out.

1.4 The site is located on Merrylees Industrial Estate, Desford, Leicester (approximate National Grid Reference 446750, 306250) as shown on the appended site location plan (Nicholls Colton Geotechnical drawing No G11149/01).

1.5 The site lies to the immediate south-east of a parcel of land owned by Mr G. Wilford. A preliminary contamination assessment, including the provision of a full desk study report, was undertaken on this land by Nicholls Colton Geotechnical in June 2011 (report ref: G11037). Mr G. Wilford has given Nicholas Marks permission to use the report as part of this preliminary contamination assessment. A copy of the report is included as Appendix A.

1.6 This investigation has been undertaken on the specific instructions of Mr N. O'Donnell and no reliance should be made by third parties as to its adequacy or completeness in relation to future development requirements of the area under consideration. Similarly Nicholls Colton Geotechnical and Nicholls Colton Group will accept no liability in relation to the use of data contained in this report by third parties.

2. Site Description

2.1 A site walkover was undertaken by a Geo-Environmental Engineer in November 2011. The significant observations are summarised below:

- At the time of the site walkover survey the site was being utilised as a car parking area and a general storage area.
- A number of old drums and a skip, which appeared to have been recently used for the burning of general site debris, were present on the site. A storage cabin was located within the northern area of the site.
- A new steel palisade fence appeared to have been recently erected along the northern boundary of the site. A row of trees formed the western site boundary and a railway line is located to the immediate east of the site – running in approximately a north-west to south-east direction.
- A number of photographs taken at the time of the site walkover are included in this report as Appendix B.

3. Desk Study – *Site History*

3.1 In order to assess the previous site usage, reference has been made to the old Ordnance Survey plans included as part of the desk study report from the previously prepared contamination assessment on the adjacent parcel of land. Copies of the plans are included within the contamination assessment report included as Appendix A. The significant findings are summarised below:

3.2 *Earliest Available Publications Dated Late 1800's*

3.2.1 The earliest available editions, dating from the late 1800's (1885 and 1886) indicate the site and surrounding land to comprise undeveloped agricultural land. A railway line, annotated the Leicester and Burton Branch on subsequent publications, is shown to the immediate east of the site. The railway line runs in approximately a north-west to south-east direction.

3.2.2 An unnamed stream/ river is shown approximately 175m to the east of the site; the stream/ river is indicated as flowing in a north-west to south-east direction. A further unnamed stream is shown approximately 550m to the east of the site and is shown to join the first stream approximately 500m to the south of the site.

3.2.3 A sand pit and two old gravel pits are shown on the earliest available publications approximately 350m to the south-west and 850m and 1.1km to the west of the site respectively. Merrylees Road is shown to have been developed to the south of the site.

3.3 *Publications Dated 1903 and 1903-1904*

3.3.1 The publications dated 1903 and 1903-1904 show a colliery and series of shafts to have been developed approximately 850m to the north-west of the site. A railway line is shown to branch off the main railway line to the colliery and to extend along the eastern area of the site.

3.3.2 The eastern area of the site is shown on these publications to be occupied by the railway track that extends to the colliery. The western area of the site remains undeveloped agricultural land.

3.4 *Publications Dated 1915 and 1919*

3.4.1 The publications dated 1915 and 1919 show further expansion of the railway tracks within the eastern area of the site, and further expansion of the railway tracks on the land to the immediate north and south of the site. The western area of the site remains undeveloped.

3.4.2 The colliery to the north-west of the site is annotated Desford Colliery and has been further developed with additional buildings, a reservoir and several additional railway lines shown to have been constructed.

3.4.3 An area of marshland is shown to the south of the site, adjacent to the railway line.

3.5 *Publications Dated 1930 and 1930-1931*

3.5.1 Three excavations and a brick works are shown to have been developed within the area of Desford Colliery on the publications dated 1930 and 1930-1931. There are no significant changes on the site and no further significant changes to the surrounding land on these publications.

3.6 *Publications Dated 1955 and 1959*

3.6.1 The publications dated 1955 and 1959 show significant development of the railway to have taken place within the area of the site. The whole site is shown on these publications to be occupied by the railway lines and sidings.

3.6.2 A colliery is shown on these publications approximately 350m to the south of the site, adjacent to Merrylees Road. A series of additional railway lines and a tramway are shown to have been developed in the location of the colliery.

3.6.3 Desford Colliery appears to have been further developed. A large building is shown within the central area of the colliery, the excavations and brick works are shown to have been enlarged and two conveyors are shown to extend into the excavations.

3.6.4 A large 'works', identified on subsequent publications as a sewage works, has been developed approximately 150m to the north of the site.

3.7 *Publications Dated 1966-1968 and 1959-1989*

3.7.1 The colliery identified to the immediate south of the site on the previous publications is annotated 'Mine' on these publications. A large coal yard is shown to the immediate south of the site. No changes to the site are shown on these publications.

3.7.2 A large refuse/ slag heap is shown within the area of Desford Colliery to the north-west of the site.

3.8 *Publication dated 1982-1985*

3.8.1 The land to the south of the site which was annotated 'Mine' on the previous publications is now annotated 'Works' on this publication.

3.8.2 The refuse / slag heaps shown within the area of Desford Colliery are now annotated 'tips (disused)'. The tips are shown to cover larger areas of the land surrounding the colliery and are located approximately 400m from the site at the closest point. A large clay pit is now shown to the south of the brick works, approximately 500m to the north-west of the site.

3.8.3 No changes to the site are shown on these publications.

3.10 *Publications Dated 1995 and 2000*

3.10.1 The site and surrounding land are shown to be occupied by Merry Lees Industrial Estate on the publications dated 1995 and 2000. A building is shown approximately 40m to the north west of the site. A single railway line forms the eastern boundary of the site.

3.10.2 Desford Colliery, previously located to the north-west of the site, is no longer shown. The land surrounding the colliery appears to have been restored and a number of ponds/ lakes are shown to now occupy this area. The clay pit is still shown to the north-west of the site.

3.11 *Publications Dated 2006 and 2010*

3.11.1 There are no significant changes on the site and no significant changes to the surrounding land on the publications dated 2006 and 2010.

4. Desk Study - *Environmental Review*

4.1 An environmental database compiled by The Landmark Group® was consulted as part of the desk study report previously undertaken on the land immediately adjacent to this site. The data is sourced from various organisations including the Environment Agency (EA), Coal Authority, British Geological Survey (BGS) and Local Authorities and relates to information that may affect the site and its environs. The environmental data contained within the previous report is also considered to be relevant to this site. A copy of the report is included in Appendix A and the notable findings may be summarised as follows:

4.2 *Agency and Hydrological*

4.2.1 There are no contaminated land register entries, enforcement and prohibition notices, integrated pollution control licenses or registered radioactive substances recorded within 500m of the site.

4.2.2 The EA has two records of discharge consents within 0 to 250m of the site. The consents relate to Severn Trent Water Limited's obligations with regard to sewage discharges into Rothley Brook. Two of the discharge consents are identified as being located approximately 131m to the north-east of the site and relate to sewage discharges from Thornton and Bagworth Station, Off Merrylees Road, Thornton, Coaville. The report identifies a further four discharge consents to be located within 251 to 500m of the site.

4.2.3 The report identifies one Integrated Pollution Prevention and Control consent to be located within 251 to 500m of the site. The consent is identified as relating to Intensive Farming (greater than 40,000 poultry) activities at Henwood Farm, Desford Road, Kirby Muxloe and is located approximately 434m to the south-east of the site.

4.2.4 The report indicates that the nearest surface water feature is located approximately 98m to the north-east of the site. The historical plans show an unnamed stream/ river at a comparable distance from the site.

4.2.5 River quality data held by the EA for watercourses in close proximity to the site include a sampling point in Rothley Brook. The report identifies a River Quality Sampling Point in Rothley Brook to have recorded a GQA Grade of B (good) on sampling visit made in 2000. The report records the sampling point as the site. It is unclear why the site is recorded as being the sampling point - the closet surface water feature (an unnamed stream/ river) is located approximately 98m to the north-east of the site.

4.2.6 The EA has four records of Pollution Incidents to Controlled Waters within 251 to 500m of the site. The closest of these is located approximately 388 metres to the south-east of the site and concerned the spillage of a miscellaneous pollutant into Rothley Brook in May 1998. The incident has been classified as a Category 3 – Minor Incident. The remaining pollution incidents recorded within 251 to 500m of the site are noted to be located 417m to the south-east, 464m to the south-east and 466m to the north-east of the site and have all been classified as Category 3 – Minor Incidents.

4.2.7 No licensed groundwater abstractions are recorded within 500m of the site. The EA has one record of a licensed groundwater abstraction within 501 to 1000m of the site. The license is recorded as being located at Busky Farm and the operator is identified as Mr C. H. Bancroft. The abstraction is recorded as being located approximately 825m to the north-east of the site and is recorded as being for general farming and domestic purposes.

4.2.8 The underlying bedrock is recorded as a Secondary Aquifer - B. Superficial deposits present at the site are classified as a Secondary Aquifer – A.

4.2.9 The site is not identified as being located within a Source Protection Zone (SPZ).

4.2.10 The report indicates that the site is located approximately 111m from an area potentially at extreme risk of flooding from a river without defences.

4.3 *Waste*

4.3.1 No BGS recorded landfill sites, historical landfill sites, local authority recorded landfill sites or registered landfill sites are identified within 250m of the site.

4.3.2 The EA have one record of a historical landfill site within 251 to 500m of the site. The landfill site is identified as being located approximately 420m to the north-west of the site on Heath Road, Coaville. The waste materials accepted by the landfill site are recorded as including inert and industrial wastes and the first input date is recorded as June 1992 – a last input date is not provided.

4.3.3 The report identifies one local authority recorded landfill sites to be located within 251 to 500m of the site. No further information is supplied on this landfill site.

4.3.4 The EA has one record of a licensed waste management facility (landfill boundary) to be located within 251 to 500m of the site. The facility is identified as Desford Brickworks and is located approximately 420m to the north-west of the site on Heath Road. The license holder for the site is Hanson Brick Ltd and the site is categorised as an industrial waste landfill. The license for the site was issued in May 1991 and the license status is recorded as inactive.

4.3.5 The EA also has one record of a licensed waste management facility (locations) to be located within 251 to 500m of the site. The facility is also identified as Desford Brickworks and is located approximately 470m to the north-west the site on Heath Road. The license holder for the site is Hanson Brick Ltd and the site is categorised as an industrial waste landfill. The license for the site is recorded as being surrendered in July 2010.

4.4 *Hazardous Substances*

4.4.1 The EA has one record of a Control of a Major Accident Hazard (COMAH) site within 251 to 500m of the site. Flogas Uk Ltd are recorded as having a site approximately 341m to the south of the site.

4.4.2 The report identifies one Planning Hazardous Substance Consent to be located within 0 to 250m of the site. Flogas Uk Ltd are noted to have made an application for a site approximately 125m to the south of the site at Stokes Industrial Park, Merrylees Road. The hazardous substance is identified as liquefied extremely flammable gas and natural gas and the decision is recorded as deemed / granted, dated July 2002.

4.5 *Geological*

4.5.1 The underlying solid geology is expected to comprise Triassic Mudstones (and are noted to include the Mercia Mustone, Dolomitic Conglomerate and Rhaetic Formations).

4.5.2 One BGS Recorded Mineral Site is recorded within 251 to 500m of the site. The mineral site is identified as Merrylees Drift and is located approximately 349m to the south of the site at Merrylees, Bagworth. Underground mining methods were adopted at the site and mining operations are recorded as 'ceased'. The commodity is noted to have been coal (deep).

4.5.3 The site lies in an area which may be affected by coal mining activity according to the BGS. The report recommends that a coal mining report is obtained from the Coal Authority.

4.5.4 As advised by the BGS, ground stability hazards such as landslide, swelling /shrinking clay and running sand are considered to represent either a very low risk or a low risk at the site. Compressible ground stability hazards are considered to represent no hazard, a very low risk and a moderate risk at the site.

4.5.5 The site lies in an area where less than 1% of homes are above the Action Level with respect to radon according to the National Radiological Protection Board. The British Geological Survey (BGS) state that no radon protection measures are necessary in the construction of new buildings or extensions at the site. It is recommended that the Local Building Control Department are contacted in order to confirm their requirements with respect to radon.

4.6 *Industrial Land Use*

4.6.1 A study of nearby trades which may potentially affect the site identifies six to be located within 0 to 250m of the site. The trades are noted to include a gas suppliers (105m from the site), a gas company (105m from the site), a power transmission equipment works (135m from the site), a packaging and wrapping equipment suppliers (183m from the site), a plastic vacuum forming works (205m from the site) and a commercial vehicle dealers (250m from the site).

4.6.2 No fuel stations are recorded within 1000m of the site.

4.7 *Sensitive Land Use*

4.7.1 The site is identified as being located within a nitrate vulnerable zone.

5. Site Work

5.1 Four trial pits (TP 1, TP 2, TP 3 and TP 4) were put down by hand excavation methods to depths in the range 0.80m (TP 1 and TP 2) to 1.00m (TP 3 and TP 4) below existing ground level.

5.2 Copies of the trial pit logs are included in Appendix C.

5.3 The positions of the hand excavated trial pits are shown on the appended exploratory hole location plan (Nicholls Colton Geotechnical drawing no. G11149/02).

5.4 Fragmentary disturbed samples were recovered from all materials revealed within the exploratory holes. Geo-environmental samples were obtained specifically for contamination testing.

5.5 The samples were taken to Nicholls Colton Analytical's laboratory for further examination and testing.

5.6 The fieldwork was carried out on 4th November 2011.

5.7 This investigation has been carried out in general accordance with BS 5930: 1999.

6. Laboratory Testing

6.1 The laboratory testing schedules were prepared by Nicholls Colton Geotechnical after consultation with the Environment Agency.

6.2 Selected soil samples have been tested for the presence of contaminants as listed below. This MCERTS accredited testing was predominantly undertaken at Nicholls Colton Analytical's (NCA) UKAS accredited laboratory (UKAS No. 0320).

(all values 'total' unless otherwise stated)

- Arsenic
- Cadmium
- Chromium
- Copper
- Lead
- Mercury
- Nickel
- Vanadium
- Polyaromatic Hydrocarbons (speciated)
- pH value
- Phenols
- Zinc
- Total Petroleum Hydrocarbons
- Fractionated Aliphatic / Aromatic Hydrocarbon Suite
- Semi Volatile Organic Compounds (SVOC Suite)
- Asbestos (presence of)
- Polychlorinated Biphenols (PCB's)

6.3 The soil testing outlined above has been carried out during the period 8th to 23rd November 2011.

6.4 The contamination test results are included as Appendix D.

6.5 No geotechnical Laboratory testing has been carried out as part of this investigation; such work is outside of the scope of this report.

7. General Geology and Revealed Strata

7.1 Geological sources (including BGS sheet 155, Coalville) indicate the site to lie in an area where Alluvial Deposits of Recent Age overlie the Mercia Mudstone strata of Triassic age. Due to the historic use of the site the presence of made ground should be anticipated.

7.2 The Geological Plans indicate made ground materials to be present across the site.

7.3 The exploratory holes revealed a general downward strata succession of:

MADE GROUND	-	Topsoil
	-	Crushed rock sub-base
	-	Brown sandy gravelly clays and silts with fragments of brick, limestone, sandstone,
	-	granite and mudstone
	-	Black silty sandy granite gravel
ALLUVIAL DEPOSITS	-	orange brown sandy gravelly clays

8. **Groundwater**

8.1 No groundwater entries were recorded during excavation of the trial pits.

8.2 No long term monitoring of groundwater levels has been undertaken as part of this investigation. It should be noted that groundwater levels may differ at times from those reported due to seasonal variations or other effects.

Assessment and Recommendations

9. **Proposed Works**

9.1 It is understood that Mr N. O'Donnell proposes to erect a portal frame unit at the site. It is understood that the industrial unit will be used as a joinery manufacturing workshop.

9.2 The purpose of this investigation was to summarise existing desk study information regarding the history and environmental status of the site. As a part of this work, a preliminary assessment of soil contamination has been carried out.

10. **Soil Profile**

10.1 *Made Ground*

10.1.1 Made ground materials have been revealed in all of the exploratory holes put down at the site, to depths in the range 0.50m (TP 3) to 0.90m (TP 4) below existing ground level.

10.1.2 The made ground materials have been noted to generally comprise a surface horizon of topsoil or crushed rock sub-base overlying brown sandy gravelly clays and silts with fragments of brick, limestone, sandstone, granite and mudstone and black silty sandy granite gravels.

10.1.3 The made ground materials encountered at the site are not considered to be putrescible/ biodegradable.

10.1.4 No visual or olfactory evidence of any contamination was noted within the made ground materials.

10.2 *Alluvial Deposits*

10.2.1 Underlying the made ground materials in TP3, Alluvial Deposits have been encountered. These deposits comprise orange brown sandy gravelly clays

10.2.2 The Alluvial deposits have been encountered from a depth of 0.50m in trial pit TP3, and a maximum recorded depth of 1.00m below existing ground level has been achieved. These deposits have not been fully penetrated by any of the exploratory holes put down at the site.

10.2.3 The cohesive Alluvial deposits have been assessed to be of a stiff consistency.

10.2.4 No visual or olfactory evidence of any contamination was noted within the natural Alluvial deposits.

11. Geotechnical Assessment

11.1 No geotechnical appraisal has been undertaken as part of this preliminary contamination assessment.

11.2 It should however be noted that the desk study data (see sections 3 and 4) has indicated that the site lies in an area which may be affected by coal mining activity according to the BGS. It is recommended that a coal mining report is obtained from the Coal Authority in order to further assess the presence of any shallow coal seams or mine entries beneath the site.

12. Conceptual Model

12.1 The historical information obtained as part of the desk study investigation indicates the site to have been occupied as agricultural land until the early 1900's. The publications dated 1903 show railway sidings to occupy the site. The site is shown to have been occupied by railway land and railway sidings until Merrylees Industrial Estate was developed in the late 1900's. The historical plans indicate colliery's to have previously been located approximately 650m to the north-west of the site and approximately 350m to the south of the site.

12.2 The environmental data indicates that the site lies on a geological formation classified as a Secondary Aquifer - B. Superficial deposits present at the site are also classified as a Secondary Aquifer – A. No groundwater abstraction licenses are recorded within approximately 500m of the site. The closest water abstraction license is recorded as being located approximately 875m to the north-east of the site and the license is recorded as being for general farming and domestic purposes. The report indicates that the nearest surface water feature (an unnamed stream/ river) is located approximately 150m to the north-east of the site. The site is not identified as being located within a Source Protection Zone (SPZ). The site is not located within an area potentially at risk of flooding from a river without defences.

12.3 No landfill sites are recorded within 250m of the site.

12.4 A *conceptual model* has been produced for the site and its environs in order to identify potential contaminants, pathways and receptors, on the basis of the desk study information included in this report. In order to undertake the conceptual model, the *source-pathway-receptor* linkage has been considered and the assessment is summarised, as follows:

12.5 *Source*

12.5.1 The site has previously been occupied by railway sidings. Potential sources of contamination at the site are therefore considered to be associated with the previous railway activities carried out at the site. The historical plans show two colliery's to have been previously located within close proximity of the site. No additional significant off-site sources of contamination have been identified within the vicinity of the site which may have potentially adversely affected the soils or groundwater underlying the site itself.

12.5.2 Consideration of the guidance provided in the Department for Environment, Food and Rural Affairs (DEFRA) and Environment Agency document 'R & D Publication CLR8: Potential Contaminants for the Assessment of Land', Tables 2.3 and 2.4 has been adopted. CLR8 suggests a series of potential contaminants which may be expected to be present within the soils and/or groundwater underlying a site. The contaminants are dependent upon the primary land usage. The following land usages and associated potential contaminants are considered relevant to this particular site:

- *Industrial Profile*
  - Agricultural land #
  - Railway Land

  # - It should be noted that this land use is not included as specific industry within CLR8 and therefore a screening suite for commonly occurring contaminants is suggested.

- Contaminants

  Metals, Semi-metals & Non-metals: Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc

  Others: Asbestos and pH value

  Organic Chemicals: Phenol, Polyaromatic Hydrocarbons, Polychlorinated Biphenols (PCB's)

  Additional Potential Contaminants: Oil/Fuel Hydrocarbons, Fractionated Aliphatic/ Aromatic Hydrocarbons and Semi Volatile Organic Compounds (SVOC Suite).

12.5.3 Soils at the site might be contaminated with the substances listed above. These are the *source* of contamination that may affect the future development.

12.6 *Pathway*

12.6.1 It is understood that Mr N. O'Donnell proposes to erect a portal frame unit at the site. It is understood that the industrial unit will be used for joinery manufacturing workshop.

12.6.2 Current proposals indicate that the site will be covered by either the building or areas of hardstanding. No areas of soft landscaping are proposed for the site.

12.6.3 On this basis, it is considered that the following pathways should be considered as part of any contamination assessment of the site (see additional notes provided below):

- *Human Health*

  Ingestion of soil
  Ingestion of dust within buildings
  Dermal contact with soil
  Dermal contact with dust within buildings
  Outdoor inhalation of fugitive dust
  Indoor inhalation of fugitive dust
  Inhalation of vapours outside
  Inhalation of vapours inside

- *Surface Water/Groundwater*

  Leaching

  NB- It should be noted that the proposal for the site is to construct a new portal frame building. The site is to be covered by either the building or areas of hardstanding - no areas of soft landscaping are proposed for the site.

  It is therefore considered that there will be no pathways to provide potential routes for the source of contamination to reach the receptors. The above pathways have been included for completeness in order to assist in characterising the level of contamination present.

12.6.4 The *pathways* provide a potential route for the source of contamination to reach the receptor.

12.7 *Receptor*

12.7.1 The following *receptors* will be present on or near the site and will therefore be potentially linked to the identified contaminant sources via the indicated pathways:

- Groundwater
- Watercourses
- Future occupiers
- Construction workers
- Building fabric
- Underground services (water pipes etc.)

12.7.2 The environmental data indicates that the site lies on a geological formation classified as a Secondary Aquifer - B. Superficial deposits present at the site are also classified as a Secondary Aquifer – A. No groundwater abstraction licenses are recorded within approximately 500m of the site. The closest water abstraction license is recorded as being located approximately 875m to the north-east of the site and the license is recorded as being for general farming and domestic purposes. The report indicates that the nearest surface water feature (an unnamed stream/ river) is located approximately 140m to the north-east of the site. The site is not identified as being located within a Source Protection Zone (SPZ). The site is not located within an area potentially at risk of flooding from a river without defences.

13. Soil Contamination

13.1 The historical information obtained as part of the desk study investigation indicates the site to have been occupied as agricultural land until the early 1900's. The publications dated 1903 show railway sidings to occupy the site. The site is shown to have been occupied by railway land and railway sidings until Merrylees Industrial Estate was developed in the late 1900's. The historical plans indicate colliery's to have previously been located approximately 650m to the north-west of the site and approximately 350m to the south of the site.

13.2 The *conceptual model* prepared and included in section 12 identified a series of potential contaminants as a result of the previous site usage. Pathways for these source contaminants to find their way to potential receptors were considered, and the receptors were based on the proposed end usage of the site and its environs.

13.3 Guidance published by the Department of Environment Food and Rural Affairs (DEFRA) and the Environment Agency has been utilised to review the results of the soil contamination analyses. In particular, the Contaminated Land Exposure Assessment (CLEA) Model has been considered.

13.4 DEFRA has published a series of Soil Guideline Value (SGV) reports for a number of contaminants. The current set of SGV's was published by DEFRA during the period March to July 2009. The SGV reports contain the background toxicological and physico-chemical data utilised by DEFRA to calculate the individual SGV's.

13.5 DEFRA have calculated the current SGV's using the CLEA v.1.04 and v.1.06 software (the software was subject to minor changes during 2009).

At present, DEFRA have published SGV's for the following –

- Arsenic
- Cadmium
- Mercury (elemental, organic and methyl)
- Nickel
- Selenium
- Benzene
- Ethylbenzene
- Phenol
- Toluene
- Xylene (o-, m-, and p-).
- Dioxins and dioxin-like PCB's

13.6 Given the relatively small size of the published data supplied by DEFRA, additional authoritative advice has been provided to industry and regulators by Land Quality Management (LQM) and the Chartered Institute of Environmental Health (CIEH). For a large set of contaminants not covered by the SGV's, LQM / CIEH have published Generic Assessment Criteria (GAC's).

13.7 The 2nd Edition LQM / CIEH GAC's were published in July 2009. The GAC's have been calculated using the CLEA v.1.04 software (the CLEA software was the subject of minor up-dates during the latter half of 2009).

13.8 The 2nd Edition of the LQM /CIEH document contains the following GAC's –

- Beryllium
- Boron
- Cadmium (note – this was simultaneously published as an SGV by DEFRA).
- Chromium (III and VI)
- Copper
- Vanadium
- Zinc
- Petroleum Hydrocarbon Fractions (16 Fractions)
- Polyaromatic Hydrocarbons (US EPA 16)
- Chloroalkanes and Alkenes (8 No.)
- Explosives (2 No.)
- Pesticides (5 No.)
- Chlorobenzenes (6 No.)
- Phenol and Chlorophenols (3 no.)
- Other (2 No.)

13.9 Additional GAC's have also been published by the Environmental Industries Commission (EIC) and the Association of Geotechnical Specialists (AGS), under the aegis of CL:AIRE, in January 2010. These GAC include antimony, barium, molybdenum and a large group of hydrocarbons, halogenated organics, phenols, phthalates and other organics.

13.10 Exceedance of a DEFRA SGV implies that an unacceptable human health risk *may* be present, and therefore either further site specific risk assessment is required, or intervention (remedial) works are necessary.

13.11 Similarly, exceedence of an LQM / CIEH (or EIC / AGS) GAC implies that an unacceptable human health risk *may* be present, and therefore either further site specific risk assessment is required, or intervention (remedial) works are necessary.

13.12 SGV's and GAC's are set according to the proposed end use of the land. For the purposes of this report, '*industrial/ commercial*' land use figures have been adopted.

13.13 The concentration of the individual contaminants identified in the conceptual model for this site have been compared to the published SGV's and GAC's, as an initial screen, to determine the degree if any of contamination present.

13.14 Where no SGV or LQM/CIEH (or EIC / AGS) GAC's are available the CLEA v.1.06 software has been utilised to derive generic values in-house by Nicholls Colton Geotechnical (of note this applies to lead).

13.15 A series of soil samples has been collected and analysed for the presence of selected contaminants. The results are included as Appendix D.

13.16 All of the individual contaminant concentrations were recorded at concentrations below the relevant SGV's / GAC's for the industrial end use.

13.17 In addition, four samples were tested for the presence of asbestos. None was detected.

13.18 Hydrocarbon testing has been carried out on three samples of the near surface soils obtained from the site.

13.19 It should be noted that no visual or olfactory evidence of hydrocarbon contamination was noted within any of the exploratory holes put down at the site.

13.20 Total hydrocarbon concentrations of 1080mg/kg (TP1 at 0.60 – 0.80m) and 162mg/kg (TP4 at 0.0 – 0.20m) have been recorded within the samples of the made ground. It should be noted that concentrations of TPH in excess of 500mg/kg are often considered to be elevated and a *potential* threat to human health. Additional comments are provided below with regard to the TPH concentrations recorded in TP 1 at 0.60 to 0.80m.

13.21 As noted above, a TPH concentration of 1080 mg/kg has been recorded in a sample of the soil from trial pit 1 at a depth of 0.60 to 0.80m. A banded hydrocarbon test has been undertaken on this sample in order to further assess the potential hydrocarbon impact. The following hydrocarbon concentrations were recorded:

C_8 to C_{10} = <6.6 mg/kg
C_{10} to C_{12} = 10.6 mg/kg
C_{12} to C_{16} = 58.4 mg/kg
C_{16} to C_{21} = 146.3 mg/kg
C_{21} to C_{35} = 795.9 mg/kg
C_{35} to C_{40} = 67 mg/kg

31.22 The banded hydrocarbon test indicates that the hydrocarbons are primarily within the heavier fuel range (C_{21} to C_{35}) (795 mg/kg). It is noteworthy that the LQM GAC for aromatic hydrocarbons C_{21} to C_{35} is 28,000 mg/kg. The banded hydrocarbon test therefore indicates that the lighter, more toxic hydrocarbon fractions are not present at elevated concentrations. Similarly, none of the available LQM GAC's for the hydrocarbon ranges C_8 to C_{40} have been exceeded. The banded hydrocarbon test therefore indicates that the hydrocarbons recorded in trial pit 1 are not present at concentrations harmful to human health.

13.23 In order to further characterise the hydrocarbon fractions present and to more fully determine the potential threat to human health, a fractionated aliphatic/ aromatic hydrocarbon test has been undertaken on a sample of the made ground (TP 1 at 0.00 to 0.20m). The fractionated hydrocarbon test results have been compared to the LQM/CIEH GAC values for the industrial land use figures. All of the individual hydrocarbon fractions were recorded below the appropriate LQM/CIEH GAC validation criteria.

13.24 The hydrocarbon test results are considered to be consistent with the nature of the near surface soils present on the site – no visual or olfactory evidence of any hydrocarbon contamination was noted within any of the exploratory holes.

13.25 Two soil samples have also been tested for a semi volatile organic compound suite (SVOC's). The results for these tests were generally all below the detection limit for each of these tests. Where appropriate the results have been compared to the LQM/CIEH GAC values for the commercial land use figures. All of the individual contaminant concentrations were recorded at concentrations below the relevant LQM GAC's for the commercial land end use. On the basis of the above, and given the very low detection limits adopted for the remaining VOC suite tests, this indicates that these potential contaminants are not present at elevated concentrations.

13.26 Two soil samples have also been tested for Polychlorinated Biphenols (PCB's).

13.27 It should be noted that no published data such as Soil Guideline Values (SGV's) for acceptable concentrations of PCB's within soil are available and therefore assessment of the concentrations obtained from the site is not straightforward.

13.28 On the basis of the toxicity of each of the individual compounds present within PCB's, similar assessments undertaken on residential and industrial developments with the potential for PCB contaminated soils have recommended that any result in excess of an apparently low detection limit should be considered as being elevated. This is considered to be a stringent approach.

13.29 Total PCB concentrations of <0.028 mg/kg were obtained from each of the soil samples. In addition, PCB concentrations of <0.004 mg/kg were recorded for each of the individual PCB compounds respectively.

13.30 On the basis of the above, and given the very low detection limits adopted for the PCB tests, this indicates that these potential contaminants are not present at elevated concentrations.

13.31 As noted above, it should be noted that the design proposals indicate that the soils present at the site will be covered by either the new building or areas of hardstanding. It is therefore considered that there will be no pathways to provide potential routes for the source of contamination to reach the receptors. It is understood that no areas of soft landscaping are proposed at the site.

13.32 On the basis of the above testing it is considered that the soils present at the site are suitable for the proposed commercial development of the site and that no remediation will be required.

13.33 Should the design proposals change, notably should any soft landscaped areas be proposed on the site, further assessment would be required.

13.34 Consideration will need to be given to the welfare of groundworkers during the construction phase of the development. Basic hygiene protocols should be implemented (e.g. washing hands prior to consuming food) and the wearing of suitable personal protective equipment (gloves, overalls etc.) is recommended as a minimum.

13.35 Should any new water supply pipes be laid at the site it is recommended that the advice provided within the WRAS (Water Regulations Advisory Scheme) document titled 'The Selection of Materials for Water Supply Pipes to be laid in Contaminated Land' should be followed in order to ensure that appropriate pipe materials are selected.

14. Ground and Surface Water Contamination

14.1 No assessment in terms of groundwater and surface water has been undertaken as part of this preliminary soil contamination assessment. Such work is outside the scope of this contamination assessment.

15. Gas Assessment

15.1 No assessment in terms of gas has been undertaken as part of this preliminary soil contamination assessment. Such work is outside the scope of this contamination assessment.

K.M.Willfratt
BSc FGS
Senior Geo-Environmental Engineer
NICHOLLS COLTON GEOTECHNICAL

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BEng CEng MICE SiLC
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APPENDIX A

Contamination Assessment Report
Land Adjoining Stokes Industrial Park, Merrylees Industrial Estate, Desford –
Report Ref: G11037 – Dated June 2011

A P P E N D I X B

Site Photographs

A P P E N D I X C

Trial Pit Logs

NICHOLLS COLTON
GEOTECHNICAL

TRIAL PIT RECORD - TP1

Site
Unit 6, Merrylees Industrial Estate, Desford, Leicester

Client	Method of excavation	Dimensions	Project No:
Nicholas Marks	Hand Excavated	0.40m x 0.40m	G11149

Logged by: PP	Ground Level:	Date: 04/11/2011	Location: -	Scale: 1:25

Samples & In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	Result						
E1	0.00-0.20					MADE GROUND - Crushed rock sub-base.		
E2	0.30-0.50				0.30	MADE GROUND - Firm brown slightly sandy slightly gravelly clay. Gravel is angular to sub angular fine to coarse granite, limestone, sandstone and brick.		
E3	0.60-0.80				0.60	MADE GROUND - Firm black slightly sandy slightly gravelly silt. Gravel is angular to sub angular fine to coarse limestone, brick and granite.		
					0.80	*End of Trial Pit 0.80 m*		

Remarks and Water Observations

1. Hand excavated trial pit to 0.80m.
2. No groundwater entries were recorded during excavation.
3. Trial pit completed at 0.80m and backfilled with arisings.

NICHOLLS COLTON
GEOTECHNICAL

TRIAL PIT RECORD - TP2

Site
Unit 6, Merrylees Industrial Estate, Desford, Leicester

Client	Method of excavation	Dimensions	Project No:
Nicholas Marks	Hand Excavated	0.40m x 0.40m	G11149

Logged by: PP	Ground Level:	Date: 04/11/2011	Location: -	Scale: 1:25

Samples & In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	Result						
E1	0.00-0.10					MADE GROUND - Topsoil.		
					0.30			
E2	0.40-0.60					MADE GROUND - Crushed rock sub-base.		
					0.80	*End of Trial Pit 0.80 m*		

Remarks and Water Observations

1. Hand excavated trial pit to 0.80m.
2. No groundwater entries were recorded during excavation.
3. Trial pit completed at 0.80m and backfilled with arisings.

NICHOLLS COLTON
GEOTECHNICAL

TRIAL PIT RECORD - TP3

Site
Unit 6, Merrylees Industrial Estate, Desford, Leicester

Client
Nicholas Marks

Method of excavation
Hand Excavated

Dimensions
0.40m x 0.40m

Project No:
G11149

Logged by: PP

Ground Level:

Date: 04/11/2011

Location: -

Scale: 1:25

Samples & In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	Result						
E1	0.00-0.20					MADE GROUND - Topsoil.		
					0.50			
E2	0.60-0.80					Stiff orange brown slightly sandy slightly gravelly CLAY. Gravel is sub angular to sub rounded fine to coarse quartz.		
					0.90	*End of Trial Pit 0.90 m*		

Remarks and Water Observations

1. Hand excavated trial pit to 0.90m.
2. No groundwater entries were recorded during excavation.
3. Trial pit completed at 0.90m and backfilled with arisings.

NICHOLLS COLTON
GEOTECHNICAL

TRIAL PIT RECORD - TP4

Site
Unit 6, Merrylees Industrial Estate, Desford, Leicester

Client	Method of excavation	Dimensions	Project No:
Nicholas Marks	Hand Excavated	0.40m x 0.40m	G11149

Logged by: PP	Ground Level:	Date: 04/11/2011	Location: -	Scale: 1:25

Samples & In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	Result						
E1	0.00-0.20					MADE GROUND - Crushed rock sub-base.		
					0.30			
E2	0.40-0.60					MADE GROUND - Firm brown slightly sandy slightly gravelly clay. Gravel is angular to sub angular fine to coarse brick and mudstone.		
E3	0.60-0.80				0.60			
						MADE GROUND - Black silty sandy angular to sub angular fine to coarse granite gravel.		
					0.90	*End of Trial Pit 0.90 m*		

Remarks and Water Observations

1. Hand excavated trial pit to 0.90m.
2. No groundwater entries were recorded during excavation.
3. Trial pit completed at 0.90m and backfilled with arisings.

A P P E N D I X D

Laboratory Test Results - Contamination

Nicholls Colton Analytical
7 - 11 Harding Street
Leicester
LE1 4DH

Nicholls Colton Analytical

Cover Sheet

Analytical Test Report:	**G11149/001**		
Your Project Reference:	**Nicholas Marks, Desford**	Samples Received on:	08.11.11
Your Order Number:	G11149	Testing Instruction Received:	08.11.11
Report Issue Number:	1	Sample Tested :	10.11 to 23.11.11
Samples Analysed	6 Soils	Report issued:	23.11.11

Signed

James Gane
Manager - Data Logistics
Nicholls Colton Analytical

Nicholls Colton Geotechnical
7-11 Harding Street
Leicester
LE1 4DH

Note:

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 28 days after issue of this report unless otherwise requested.

Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30˚C.

Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve, where appropriate these results have been corrected for moisture content but not stone content.

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G11149/001

Project Reference - Nicholas Marks, Desford

Analytical Test Results - Soil Samples

NCA Reference			11-16380	11-16381	11-16382	11-16383	11-16384	11-16385
Client Sample Reference			TP1	TP1	TP2	TP3	TP3	TP4
Client Sample Location			E1	E3	E1	E1	E2	E1
Depth (m)			0.0-0.2	0.6-0.8	0.0-0.1	0.0-0.2	0.6-0.8	0.0-0.2
Top of Sample (m)			0.0	0.6	0.0	0.0	0.6	0.0
Date of Sampling			Not provided	Not provided	Not provided	Not provided	Not provided	Not provided
Time of Sampling			Not provided	Not provided	Not provided	Not provided	Not provided	Not provided
Sample Matrix			Sand	Sand	-	Clay	Clay	Sand
Determinant	**Units**	**Accreditation**						
Arsenic	(mg/kg)	MCERTS	14.4	-	-	9.3	9.5	33.7
Cadmium	(mg/kg)	MCERTS	<2.5	-	-	<2.5	<2.5	2.8
Chromium (Total)	(mg/kg)	MCERTS	23.0	-	-	26.8	25.5	19.2
Copper	(mg/kg)	MCERTS	82.9	-	-	90.1	24.8	91.2
Lead	(mg/kg)	MCERTS	8.0	-	-	91.6	15.7	11.4
Mercury	(mg/kg)	UKAS	<0.7	-	-	<0.7	<0.7	<0.7
Nickel	(mg/kg)	MCERTS	21.4	-	-	34.7	34.0	39.2
Vanadium	(mg/kg)	UKAS	48.3	-	-	31.0	34.7	43.9
Zinc	(mg/kg)	MCERTS	109	-	-	147	66.2	137
Total Phenols	(mg/kg)	MCERTS	<1.0	-	-	<1.3	<1.1	<1.1
pH	pH Units	UKAS	8.7	-	-	7.9	8.1	9.5
Acenaphthene	(mg/kg)	MCERTS	<0.1	-	-	0.2	0.3	<0.1
Acenaphthylene	(mg/kg)	UKAS	<0.1	-	-	<0.1	<0.1	<0.1
Anthracene	(mg/kg)	UKAS	<0.1	-	-	0.2	0.6	<0.1
Benzo (a) anthracene	(mg/kg)	MCERTS	<0.1	-	-	0.8	0.9	<0.1
Benzo (a) pyrene	(mg/kg)	MCERTS	<0.1	-	-	0.8	0.7	<0.1
Benzo (b) fluoranthene	(mg/kg)	MCERTS	<0.1	-	-	1.2	1.1	0.1
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	<0.1	-	-	0.7	0.5	<0.1
Benzo (k) fluoranthene	(mg/kg)	MCERTS	<0.1	-	-	0.3	0.3	<0.1
Chrysene	(mg/kg)	MCERTS	<0.1	-	-	1.0	0.9	<0.1
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	<0.1	-	-	<0.1	<0.1	<0.1
Fluoranthene	(mg/kg)	MCERTS	0.4	-	-	2.1	3.2	0.4
Fluorene	(mg/kg)	MCERTS	<0.1	-	-	0.1	0.5	<0.1
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	<0.1	-	-	0.5	0.5	<0.1
Naphthalene	(mg/kg)	MCERTS	0.6	-	-	2.8	2.4	1.8
Phenanthrene	(mg/kg)	MCERTS	0.4	-	-	1.5	3.4	0.5
Pyrene	(mg/kg)	MCERTS	0.3	-	-	1.8	2.4	0.3
Total PAH	(mg/kg)	UKAS	2.9	-	-	14.1	17.8	4.2
Total TPH	(mg/kg)	MCERTS	-	1080	-	-	-	162
Organic Matter Content (LOI)	(%)	UKAS	-	-	-	-	6.7	-
Asbestos	-	UKAS	Non-Asbestos Fibre	-	Non-Asbestos Fibre	Non-Asbestos Fibre	-	Non-Asbestos Fibre

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G11149/001

Project Reference - Nicholas Marks, Desford

Analytical Test Results - Soil Samples

NCA Reference			11-16380	11-16383
Client Sample Reference			TP1	TP3
Client Sample Location			E1	E1
Depth (m)			0.0-0.2	0.0-0.2
Top of sample (m)			0.0	0.0
Date of Sampling			Not provided	Not provided
Time of Sampling			Not provided	Not provided
Sample Matrix			Sand	Clay
Determinant	**Units**	**Accreditation**		
Aliphatics				
$>C_5$ to C_6	(mg/kg)	None	<0.01	-
$>C_6$ to C_8	(mg/kg)	None	<0.01	-
$>C_8$ to C_{10}	(mg/kg)	None	<10	-
$>C_{10}$ to C_{12}	(mg/kg)	None	<10	-
$>C_{12}$ to C_{16}	(mg/kg)	None	<10	-
$>C_{16}$ to C_{21}	(mg/kg)	None	<10	-
$>C_{21}$ to C_{35}	(mg/kg)	None	13	-
Aromatics				
$>C_5$ to C_6	(mg/kg)	None	<0.01	-
$>C_6$ to C_8	(mg/kg)	None	<0.01	-
$>C_8$ to C_{10}	(mg/kg)	None	<10	-
$>C_{10}$ to C_{12}	(mg/kg)	None	<10	-
$>C_{12}$ to C_{16}	(mg/kg)	None	<10	-
$>C_{16}$ to C_{21}	(mg/kg)	None	<10	-
$>C_{21}$ to C_{35}	(mg/kg)	None	21	-

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G11149/001

Project Reference - Nicholas Marks, Desford

Analytical Test Results - SVOC results

NCA Reference			11-16380	11-16385
Client Sample Reference			TP1	TP4
Client Sample Location			E1	E1
Depth (m)			0.0-0.2	0.0-0.2
Top of sample (m)			0.0	0.0
Date of Sampling			Not provided	Not provided
Time of Sampling			Not provided	Not provided
Sample Matrix			Sand	Sand
Determinant	**Units**	**Accreditation**		
1,2,4-Trichlorobenzene	(mg/kg)	none	< 1	< 1
1,2-Dichlorobenzene	(mg/kg)	none	< 1	< 1
1,3-Dichlorobenzene	(mg/kg)	none	< 1	< 1
1,4-Dichlorobenzene	(mg/kg)	none	< 1	< 1
2,4,5-Trichlorophenol	(mg/kg)	none	< 1	< 1
2,4,6-Trichlorophenol	(mg/kg)	none	< 1	< 1
2,4-Dichlorophenol	(mg/kg)	none	< 1	< 1
2,4-Dimethylphenol	(mg/kg)	none	< 1	< 1
2,4-Dinitrophenol	(mg/kg)	none	< 1	< 1
2,4-Dinitrotoluene	(mg/kg)	none	< 1	< 1
2,6-Dinitrotoluene	(mg/kg)	none	< 1	< 1
2-Chloronaphthalene	(mg/kg)	none	< 1	< 1
2-Chlorophenol	(mg/kg)	none	< 1	< 1
2-methyl phenol	(mg/kg)	none	< 1	< 1
2-Methylnaphthalene	(mg/kg)	none	< 1	< 1
2-Nitroaniline	(mg/kg)	none	< 1	< 1
2-Nitrophenol	(mg/kg)	none	< 1	< 1
3-Nitroaniline	(mg/kg)	none	< 1	< 1
3/4-Methylphenol	(mg/kg)	none	< 1	< 1
4-Bromophenyl phenylether	(mg/kg)	none	< 1	< 1
4-Chloro-3-methylphenol	(mg/kg)	none	< 1	< 1
4-Chloroaniline	(mg/kg)	none	< 1	< 1
4-Chlorophenyl phenylether	(mg/kg)	none	< 1	< 1
4-Nitroaniline	(mg/kg)	none	< 1	< 1
4-Nitrophenol	(mg/kg)	none	< 1	< 1
Acenaphthene	(mg/kg)	MCERTS	< 0.1	< 0.1
Acenaphthylene	(mg/kg)	MCERTS	< 0.1	< 0.1
Anthracene	(mg/kg)	MCERTS	< 0.1	< 0.1
Azobenzene	(mg/kg)	none	< 1	< 1
Benzo(a)Anthracene	(mg/kg)	MCERTS	< 0.1	< 0.1
Benzo(a)Pyrene	(mg/kg)	MCERTS	< 0.1	< 0.1
Benzo(b)Fluoranthene	(mg/kg)	MCERTS	< 0.1	0.1
Benzo(ghi)Perylene	(mg/kg)	MCERTS	< 0.1	< 0.1
Benzo(k)Fluoranthene	(mg/kg)	MCERTS	< 0.1	< 0.1
Bis (2-chloroethoxy) methane	(mg/kg)	none	< 1	< 1
Bis (2-chloroethyl) ether	(mg/kg)	none	< 1	< 1
Bis (2-chloroisopropyl) ether	(mg/kg)	none	< 1	< 1
Bis (2-ethylhexyl)phthalate	(mg/kg)	none	< 1	< 1
Butyl benzylphthalate	(mg/kg)	none	< 1	< 1
Carbazole	(mg/kg)	none	< 1	< 1
Chrysene	(mg/kg)	MCERTS	< 0.1	< 0.1
Di-n-butylphthalate	(mg/kg)	none	< 1	< 1
Di-n-octylphthalate	(mg/kg)	none	< 1	< 1
Dibenzo(ah)Anthracene	(mg/kg)	MCERTS	< 0.1	< 0.1

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G11149/001

Project Reference - Nicholas Marks, Desford

Analytical Test Results - SVOC results

NCA Reference			11-16380	11-16385
Client Sample Reference			TP1	TP4
Client Sample Location			E1	E1
Depth (m)			0.0-0.2	0.0-0.2
Top of sample (m)			0.0	0.0
Date of Sampling			Not provided	Not provided
Time of Sampling			Not provided	Not provided
Sample Matrix			Sand	Sand
Determinant	**Units**	**Accreditation**		
Dibenzofuran	(mg/kg)	none	< 1	< 1
Diethyl phthalate	(mg/kg)	none	< 1	< 1
Dimethyl phthalate	(mg/kg)	none	< 1	< 1
Fluoranthene	(mg/kg)	MCERTS	< 0.1	0.4
Fluorene	(mg/kg)	MCERTS	0.4	< 0.1
Hexachlorobenzene	(mg/kg)	none	< 1	< 1
Hexachlorobutadiene	(mg/kg)	none	< 1	< 1
Hexachlorocyclopentadiene	(mg/kg)	none	< 1	< 1
Hexachloroethane	(mg/kg)	none	< 1	< 1
Indeno(123-cd)Pyrene	(mg/kg)	MCERTS	< 0.1	< 0.1
Isophorone	(mg/kg)	none	< 1	< 1
Naphthalene	(mg/kg)	MCERTS	0.6	1.8
Nitrobenzene	(mg/kg)	none	< 1	< 1
Pentachlorophenol	(mg/kg)	none	< 1	< 1
Phenanthrene	(mg/kg)	MCERTS	0.4	0.5
Phenol	(mg/kg)	none	< 1	< 1
Pyrene	(mg/kg)	MCERTS	0.3	0.3

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G11149/001

Project Reference - Nicholas Marks, Desford

Sample Descriptions

NCA Reference	Client Sample Reference	Sample Location	Description	Moisture Content (%)	Stone Content (%)
11-16380	TP1	E1	Brown gravelly sand	4.1	41
11-16381	TP1	E3	Black clayey sand with burnt slag, coal and organic matter	32	11
11-16383	TP3	E1	Dark brown slightly sandy clay with organic matter	26	16
11-16384	TP3	E2	Brown red sandy clay with organic matter	14	12
11-16385	TP4	E1	Red brown gravelly sand	5.6	39

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G11149/001

Project Reference - Nicholas Marks, Desford

Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	Metals	Air Dried	In house method statement - MS - CL - ICP metals
Soil	PAH	Air Dried	In house method statement - MS - CL - PAH
Soil	Phenols	As Received	In house method statement - MS - CL - Phenols (Skalar)
Soil	PCB	Air Dried	In house method statement - MS - CL - PCB
Soil	pH	Air Dried	BS 1377, Part 3, 1990
Soil	Organic Matter Content	Air Dried	BS 1377, Part 3, 1990 (LOI)
Soil	Total TPH	As Received	In house method statement - MS - CL - TPH - Sample was not subject to a 'scrubbing' cleanup step prior to analysis
Soil	CWG	As Received	In house method statement - MS - CL - EPH and VPH
Soil	Asbestos	As Received	Analysis subcontracted to AOH
Soil	SVOC	As Received	In house method statement - MS - CL - SVOC and MS - CL - PAH

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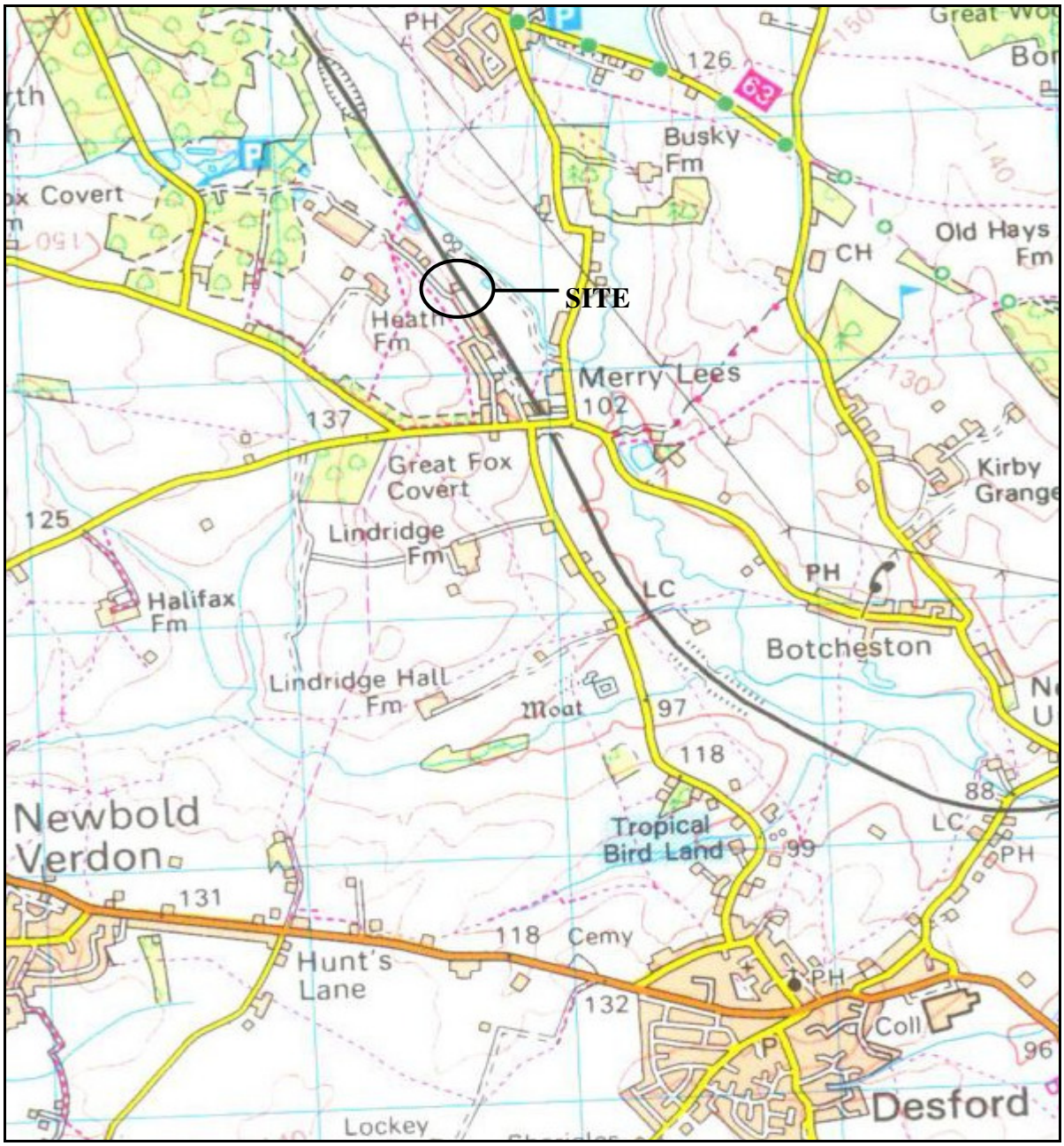
DRAWINGS

G11149/01 Site Location Plan

G11149/02 Exploratory Hole Location Plan



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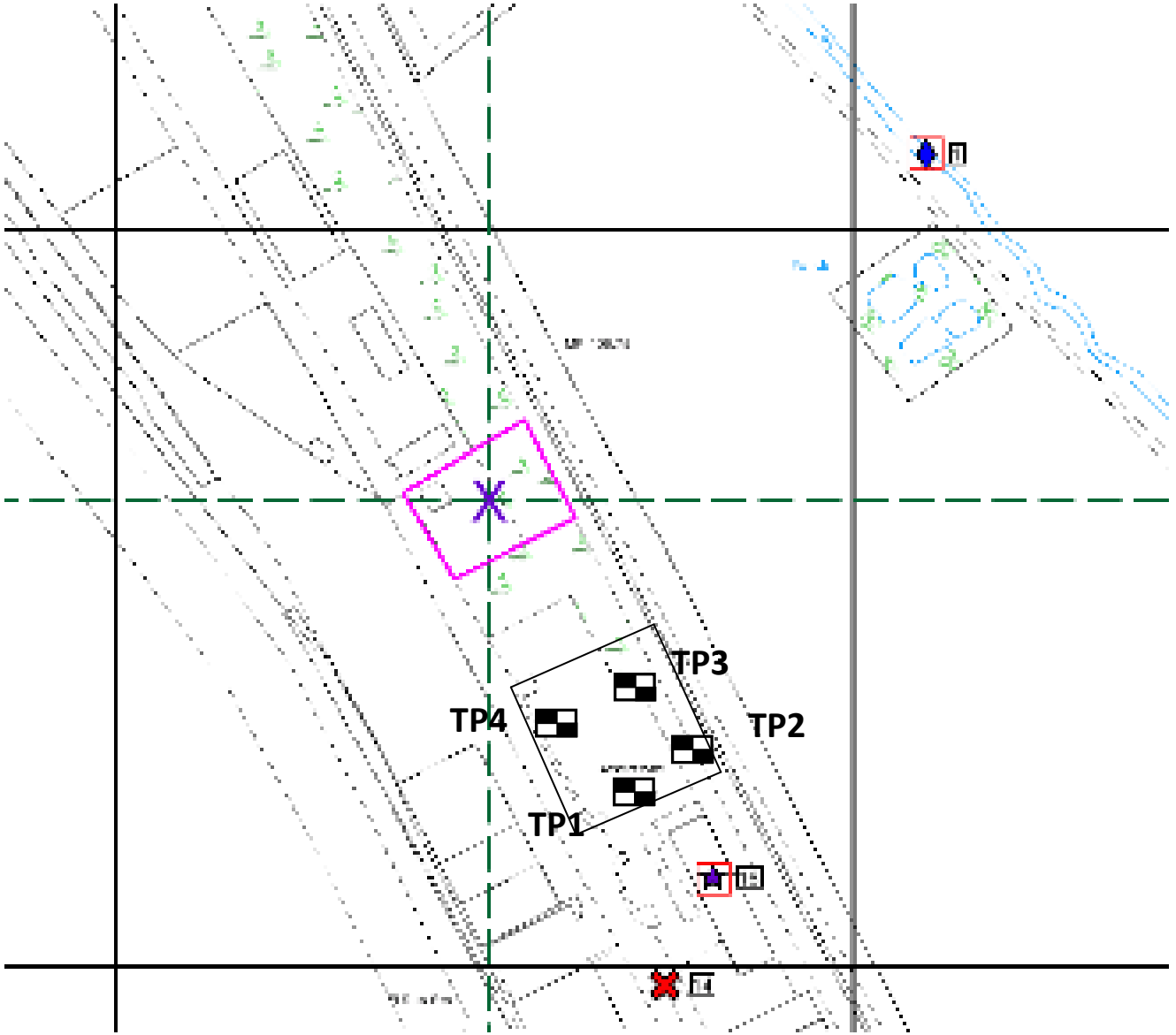
NICHOLLS COLTON GEOTECHNICAL 7-11 Harding Street Leicester LE1 4DH	**Client:** Nicholas Marks

Project:
Unit 6, Merrylees Industrial Estate, Desford, Leicestershire

Drawing No:	**Title:**	**Date:**
G11149/01	Site Location Plan	December 2011



Key:

- Approximate Trial Pit Position

Not To Scale

NICHOLLS COLTON
GEOTECHNICAL

Client:
Nicholas Marks

Project:
Unit 6, Merrylees Industrial Estate, Desford

Title:
Exploratory Hole Location Plan

Date:
December 2011

Drawing No.
G11149/02