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# EBN HIGH SCHOOLS – LYTHAM RD, MANCHESTER

# CONTAMINATED LAND AND GEOTECHNICAL DESK STUDY REPORT

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# 1. INTRODUCTION

Ramboll UK Ltd (Ramboll) has been appointed by Laing O'Rourke as Multi-Disciplinary Engineer for the development of a high school at Lytham Road as part of the EBN High School programme for Manchester City Council.

Part of this commission is to undertake a Contaminated Land and Geotechnical Desk Study in support of the planning application.

## 1.1. Development Proposals

The development proposals comprise the clearance of the existing structures on site and overgrown vegetation and construction of a new high school development and sports hall with associated parking, sports pitches, outdoor curriculum spaces, hard landscaped areas and soft landscaped areas with potential habitat/growing spaces.

## 1.2. Objectives

The objective of a contaminated land and geotechnical desk study is to provide a preliminary risk assessment identifying potential risks and constraints associated with the ground and groundwater conditions, and any contamination which may be present.

## 1.3. Scope of Works

The scope of this study is as follows:

- Review desk-based information sources including site history, geology, hydrogeology, hydrology, environmental and regulatory information, radon and ground gas, and unexploded ordnance;
- Review any relevant previous ground investigation reports;
- Establish a contaminated land Conceptual Site Model and undertake a Preliminary Risk Assessment;
- Provide recommendations regarding the geotechnical suitability of the site for the proposed end use;
- Provide a preliminary foundation design assessment;
- Provide recommendations for a ground investigation to inform the design and construction of the development, and to provide sufficient information to enable potential risks from contaminated land to be established.

## 1.4. Previous Ground Investigations

A ground investigation was undertaken at the site in October 2015 by Robson Liddle. However, neither Laing O'Rourke nor Ramboll can rely on the investigation reports and do not have the warrantees or permissions to use the data obtained. The reports that relate to the previous ground investigation are:

- Robson Liddle (2015) *Preliminary Contamination and Geotechnical Risk Assessment*, Report Ref. 12-12-16-1-1136/DSR1, August 2015; and
- Robson Liddle (2015) *Ground Investigation Report*, Report Ref. 12-12-16-1-1163/GIR1, December 2015.

Relevant data within these reports will be referenced in the appropriate sections of this report.

### 1.5. Limitations

This report has been prepared for Laing O'Rourke and shall not be relied upon by any third party unless that party has been granted a contractual right to rely on this report for the purpose for which it was prepared.

This report has been prepared in general accordance with current UK guidance.

The findings and opinions in this report are based upon information derived from a variety of information sources. Ramboll believe these information sources to be reliable. Information from the public register was largely derived from the Envirocheck environmental database; information sources for this database include the Environment Agency, the Coal Authority and other statutory authorities.

This review has been prepared on the basis of the above information. Ramboll cannot accept any liability for the accuracy or otherwise of any information derived from third party sources.

It should be noted that some of the aspects considered in this study are subject to change with time. Therefore, if the development is delayed or postponed for a significant period, a review should be completed to confirm that no changes have taken place, either at the site or within relevant legislation. The risk assessment detailed in the report is based on the end use specified; if this end use is changed then this risk assessment must be reviewed and amended as appropriate.

References to possible asbestos containing material made within this report do not constitute an asbestos survey. Ramboll are not asbestos specialists and cannot provide specific asbestos risk assessment advice, it is recommended that the Client appoints an asbestos consultant to advise on any matters relating to asbestos.

This report addresses contaminated land and geotechnical issues only. No intrusive ground investigation works were undertaken as part of this study.

# 2. SITE DETAILS

## 2.1. Site Location

The site is located approximately 5km southeast of Manchester city centre at national grid reference 386560, 394400. The site is approximately 3.21 Ha (7.92 acres) in area and is roughly rectangular in shape, except for a railway line that forms the eastern site boundary, cutting across the southeast corner of the rectangle and forming a trapezoidal shape. A Site Location Plan is presented as Fig. 1.

## 2.2. Site Description

A site walkover survey was undertaken by a representative from Ramboll in February 2016. The site is a former recreation ground which appears to be currently disused with a former cricket pitch in the centre of the site and tennis courts along the western site boundary. The edges of the site have become overgrown with mature trees, shrubs and rank vegetation including brambles.

The northern site boundary is heavily vegetated with shrubs and mature trees.

The eastern site boundary is a mass of dense vegetation including brambles leading up to the railway embankment. There is a lighting column supporting flood lights in the north-eastern area of the site; it is not known if these lights are in good working order. There is a telecommunications mast on site which appears to be in good condition. There is also a plant room associated with the telecommunications mast along the eastern site boundary which is fenced-off from the rest of the site and locked. To the south of the plant room are brick built structures approx. 1.0m in height. It is unknown what these structures were originally part of.

There appear to be relict foundations and hardstanding associated with the former pavilion structure in the south-eastern part of the site.

The southern site boundary is defined by a palisade type fence, the remains of a hedge, and by rank vegetation.

There are brick/concrete/wooden structures in the south-western corner of the site which appear to have been used as changing rooms. They are in disrepair and no longer in use.

The tennis courts in the west of the site are no longer visible apart from the net up-stands. There is evidence of fly tipping along the western site boundary including old beds, general household rubbish, chairs, plastic sledge and garden pots, kitchen cupboard doors, *etc*. These items appear to have been tipped from the adjacent residential properties (although this is not proven).

The site is bounded to the north by semi-detached residential properties on 4No. Cul-de-sac streets that run north-south off Old Hall Lane further to the north, to the east by the railway line and embankment structure, to the south by Lytham Road with Birchfields Primary School beyond, and to the west by semi-detached residential properties along Birchfield Road.

A Site Layout Plan is presented in Fig. 2. The site walkover notes and photographs are included within Appendix A.

### 2.3. Surrounding Land Use

The site lies within an area characterised by suburban residential development, but including mixed use of residential, educational, commercial and open space.

The site is bound to the:

- North by semi-detached residential housing with further extensive residential development further to the north;
- East by a railway line on an embankment with extensive residential development beyond;
- South by Lytham Road and Birchfields Primary School with a retail park, the railway line and extensive residential development further south; and
- West by semi-detached housing along Birchfields Road with Richmond Park, the Armitage Sports Centre and the Fallowfield Campus of Manchester University beyond.

### 2.4. Topography

The site is generally flat with no discernable slope.

# 3. SITE HISTORY

The site history has been derived from the 1:1,250, 1:10,560 and 1:10,000 scale historical Ordnance Survey maps provided in the Envirocheck report included within Appendix B. A summary of the main features has been provided in Table 3.1 below. Potentially contaminative historic land uses are highlighted in ***bold italics***.

**Table 3.1: Summary Site History**

| Date | Significant Land Uses and Changes in Use | |
|---|---|---|
| | **On Site** | **Off-site** |
| 1848, 1893 | The site is marked as agricultural land with a field boundary in the centre of the site. | The surrounding land is predominantly agricultural; a ditch annotated *Nico Ditch* is marked flowing E-W approx. 100m N of the site, along the line of the current Old Hall Lane. Several small ***ponds*** are marked within 100m of the site. *Slade Farm* is marked approx. 150m SE. |
| 1907, 1908-1909 | - | Residential developments marked 250m SE of the site. |
| 1922-1933, 1923 | - | ***Railway line*** marked adjacent to E site boundary. Further residential development beyond the railway line E of the site (approx. 100m). |
| 1933-1934, 1934 | The site is marked *Athletic Ground* with tennis courts and pavilion in the W of the site. | Railway line adjacent to E site boundary is marked *London, Midland and Scottish Railway*. Housing is marked along the N and W site boundaries and a *School* and playing fields are shown south of the site. *Slade Farm* is no longer marked. *Nico Ditch* is no longer marked to the N but is understood to have been culverted under Old Hall Lane. The ponds are no longer shown and appear to have been infilled. A ***Tramway Depot*** is marked approx. 150m S of the site beyond the school. A *Sports Fields* with *Pavilion* and *Tennis Ground* are marked approx. 100m W of the site and a netball and football ground is shown approx. 100m SW. |
| 1938 | - | - |
| 1955-1956 | - | - |
| 1957 | - | School south of the site is marked *Birchfileds Junior and Infant School*. The former *Tramway Depot* is now marked ***Bus Depot***. *Allotment Gardens* are shown approx. 50m NE and 130m N. |
| 1957-1988, 1976 | - | Allotment gardens are no longer marked N and NE of the site. |
| 1984 | A *Pavilion* is marked in the SE corner of the site. | - |
| 1992, 1990-1993 | - | - |
| 1995 | - | The former ***Bus Depot*** site is now marked *Fallowfield Shopping Centre*. |
| 2006 | - | - |
| Present | The *Pavilion* in the SE corner of the site is no longer marked. A telecoms mast is marked N of the former pavilion. | - |

**Notes:**
- No significant changes in use
Potentially contaminative historic land uses are highlighted in ***bold italics***.

In summary, the following potential historic contamination sources have been identified:

**On site**

- ***Construction and demolition of Pavilion*** and other structures; and
- ***Agricultural activities*** at the site.

**Off-site**

- ***Railway line*** adjacent to the eastern site boundary;
- ***Infilling of small ponds*** within 100m of the site;
- ***Agricultural activities*** on fields close to the boundary; and
- ***Tramway*** and ***Bus Depot*** approximately 150m south of the site.

### 3.1. Unexploded Ordnance

The Zetica Regional UXB Risk Map for Manchester shows the site to be located in an area of moderate risk from unexploded ordnance.

The historical OS maps show that the site has not been significantly redeveloped since the end of the Second World War. An area of deep Made Ground (to a depth of 1.90m below ground level [mbgl]) was identified by Robson Liddle in the centre of the site (TP5) which was unexplained. Risks from unexploded ordnance are therefore considered medium.

We understand that Manchester City Council is to appoint Bactec directly to undertake the necessary investigations prior to any intrusive site works commencing.

# 4. ENVIRONMENTAL SETTING

The information provided within this section is based primarily on information from the following sources:

- British Geological Survey (BGS): https://www.bgs.ac.uk/;
- Environment Agency (EA): http://maps.environment-agency.gov.uk;
- Coal Authority: http://mapapps2.bgs.ac.uk/coalauthority/home.html;
- Public Health England: http://www.ukradon.org/;
- Natural England: http://www.magic.gov.uk/;
- Previous reports referenced in Section 1.4 above; and
- Envirocheck report.

## 4.1. Published Geology, Hydrogeology and Hydrology

Published information is summarised in Tables 4.1- 4.3 below.

**Table 4.1: Geological Features**

| Feature | Details |
|---|---|
| Geology | BGS Sheet 85 shows the geology to be Devensian Till overlying the Halesowen Formation of Mudstone, Siltstone and Sandstone. The Envirocheck Geology extract shows the site to be underlain by mainly Halesowen Formation with Collyhurst Sandstone Formation in the very SW corner of the site and Etruria Formation of Sandstone and Mudstone at the NE corner of the site.<br>Although not shown on the BGS maps, Made Ground was identified in the centre of the site and in the areas of the tennis courts and former pavilion.<br>Information published by the BGS indicated that the site is expected to be principally underlain by Halesowen Formation. The Halesowen Formation is described by the BGS as "Grey-green, micaceous sandstone (litharenite), and grey-green mudstone, with thin coals and limestone beds known as the 'Spirobis' limestone, with local intraformational conglomerate, strata may be reddened, locally".<br>The mudstone is anticipated to be weathered to firm and stiff clay in the upper parts. Superficial deposits comprising Glacial Till may overlie the Halesowen Formation. The Etruria Formation (sandstone and mudstone) outcrop in the north eastern corner of the site, which are described as "Red, purple, brown, ochreous, green, grey and commonly mottled mudstone, with lenticular sandstones and conglomerates". The Collyhurst Sandstone Formation is present immediately SW of the site.<br>Historical borehole logs (SJ89SE7 380m E, SJ89SE14 380m SE and SJ89SE840 420m SW of the site boundary), obtained from the BGS website (http://mapapps2.bgs.ac.uk/geoindex/home.html?theme=boreholes) show ground conditions to comprise topsoil underlain by firm to stiff grey-brown glacial clay. The borehole records are presented in Appendix C.<br>There is a geological fault approx. 100m W of the site running from NW to SE and a fault running NW to SE approximately 250m NW of the site. |
| Geohazards | The Envirocheck report states that the site is at very low or no risk from the following ground stability hazards:<br>• Collapsible Ground<br>• Compressible Ground<br>• Ground Dissolution<br>• Running Sand<br>• Shrinking or Swelling Clay<br>• Landslides<br>No assessment of the validity of these risk classifications has been made at this stage. |

| Feature | Details |
|---|---|
| Radon | The property is not in a radon affected area, as less than 1% of homes are above the action level<br>No radon protective measures are therefore necessary in the construction of new dwellings or extensions |
| Ground gas | There is potential for ground gas to be generated from Made Ground deposits at the site. Robson Liddle identified elevated concentrations of carbon dioxide between 0.5% and 1.9% during the limited ground gas monitoring undertaken. |
| Mineral extraction | The site is not within an area potentially affected by mining.<br>The site is not within a brine compensation area.<br>There are no BGS recorded mineral sites within 1km of the site. |

**Table 4.2: Hydrogeological Features**

| Feature | Details |
|---|---|
| Aquifers | The underlying Devensian Till is classified as an Unproductive Aquifer. The underlying Halesowen Formation and Etruria Formation are classified as a Secondary A Aquifer. The Collyhurst Sandstone Formation in the very south western corner of the site is shown as a Principal Aquifer. |
| Groundwater depth | From the Robson Liddle investigation, groundwater was not identified during the ground investigation. |
| Groundwater quality | Unknown |
| Groundwater abstractions and Source Protection Zones | The site is very close (few metres) from a Zone 3 of a groundwater source protection zone (SPZ) defined to protect water supply abstractions. The protected abstraction is approximately 3km to the north west.<br>The Envirocheck report does not have any records of any other groundwater abstractions within 1km of the site. |

**Table 4.3: Hydrological Features**

| Feature | Details |
|---|---|
| Surface water features | The nearest surface water feature is *Fallowfield Brook* approx. 300m S of the site. *Platt Brook* is approx. 1km NW of the site and *Gore Brook* is approx. 750m NW of the site. There is an *extended culvert* shown on the Envirocheck report approx. 750m NW which extends to approx. 1.2km SE of the site at Broom Lane. The culvert is shown to directly cross under the site from the NW to SE. |
| River Quality | *Fallowfield Brook* is shown as River Quality C. |
| Surface water abstractions | None |
| Drainage features | None |
| Flooding | Not in flood risk zone. |

## 4.2. Environmental Records

Environmental permits, licences, consent provide an indication of potentially contaminative activities in the local area. Potentially sensitive sites in the area are considered as potential receptors. The key environmental records are summarised in Table 4.4.

**Table 4.4: Environmental Records**

| Records | Details |
|---|---|
| Discharge Consents | The Envirocheck report lists 18No. discharge consents, the closest of which is for United Utilities 369m SE of the site for *Storm Sewage Overflow* into an unknown receiving water. |
| Pollution incidents | The closest incident is noted to be 353m SE for sink waste into *Fallowfield Brook* causing a minor (Category 3) incident. The next nearest incident was 600m S of the site for private sewage systems, for unknown sewage entering *Cringle Brook* causing a significant (Category 2) incident. |
| Landfill and waste sites | None within 250m of the site |
| Regulated activities | There are 6No. Local Authority Pollution Prevention and Control records within 1km of the site with only 3No. authorised or permitted. The closest is 355m S for *Birchfields Service Station* for petrol filing station, however the license is recorded as *revoked*. The closest authorised record is 909m SW for S Marshall Motor Engineers for waste oil burners. |
| Contemporary Trade Directory Entries | There are 28No. entries within 500m of the site. However, only 9No. are active entries, the closest being 146m SE for Alpha for freight forwarding.<br>The other entries are for hardware stores, car washing equipment and supplies, electrical engineers, pet foods, printers, textile manufacturers, car dealers and garage services, meat wholesalers and French polishers. |
| Fuel Station Entries | None within 500m of the site |
| Potentially Sensitive Sites | None within 1km of the site |

## 4.3. Previous Ground Investigation

A ground investigation was undertaken by Robson Liddle in October 2015 which is appended as Appendix D. The investigation comprised 6No. window sample boreholes to a max. depth of 4mbgl, 3No. cable percussion boreholes to a max. depth of 11.5mbgl, and 9No. machine-excavated trial pits to a max. depth of 3.2mbgl.

Topsoil was encountered in the majority of exploratory holes between 0.25mbgl and 0.45mbgl overlying firm to hard gravelly clays to between 8.00-11.50mbgl which were underlain by mudstone bedrock. Localised Made Ground was identified in the areas of the former pavilion in the SE area of the site and along the W site boundary in the location of the former tennis courts. TP5 in the centre of the site encountered Made Ground to a depth of 1.90mbgl.

Groundwater was not encountered in any of the exploratory holes during the ground investigation, however during the subsequent monitoring of the wells groundwater was recorded to be between 0.18-1.58mbgl in the period from October to November 2015.

Gas monitoring wells were installed in 3No. of the window sample boreholes which at the time of Robson Liddle writing their report, was the location of the proposed structures onsite. Only 3No. rounds of ground gas monitoring were undertaken, during which carbon dioxide concentrations were recorded between 0.5% and 1.9% v/v. Methane was not detected above the detection limit of the instrument used. Oxygen levels were recorded between 18.6% and 20.4% v/v.

Chemical analysis of soil samples identified widespread elevated concentrations of certain polycyclic aromatic hydrocarbons (PAHs) [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene and dibenzo(a,h)anthracene] in topsoil across the whole site, at concentrations that exceed the generic assessment criteria (GAC) for Public Open Space

1 (green space close to housing), which is considered the most realistic GAC for this setting.

There were no obvious sources of contamination noted (*i.e.*, visual or olfactory indications of potential contamination).

# 5. GROUND CONTAMINATION – RISK EVALUATION

## 5.1. Conceptual Site Model

The information presented in the previous sections of this report have been collated and evaluated to develop an initial conceptual model for the site. Further details of the legislative context and background to assessment methodologies are provided in Appendix E.

### 5.1.1. Potential Sources

The potential contamination sources are summarised in Table 5.1.

**Table 5.1: Potential Sources**

| Source | Key Potential Contaminants |
|---|---|
| **ON SITE** | |
| Former buildings and dwellings | Metals, hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), asbestos-containing materials (ACMs), pH |
| Made Ground | Metals, hydrocarbons, ACMs, PAHs, pH, ground gas |
| Agricultural activities on site | Pesticides (including organochlorine and organophosphorus pesticides), herbicides (including triazine herbicides), hydrocarbons, ACMs, nitrates, ammonia, heavy metals (*e.g.*, lead, cadmium, arsenic, mercury) from applied organic wastes, pH, ground gas |
| Ground gases from either Made Ground or natural superficial deposits | Ground gas |
| **OFF SITE** | |
| Railway line | Hydrocarbons, ACMs, PAHs, metals, herbicides |
| Infilled ponds | ACMs, hydrocarbons, metals, PAHs, ground gas |
| Agricultural activities | Pesticides, herbicides, hydrocarbons, ACMs, nitrates, ammonia, heavy metals (*e.g.*, lead, cadmium, arsenic, mercury) from applied organic wastes, pH, ground gas |
| Tramway/Bus Depot | Metals, hydrocarbons, solvents, PAHs |

### 5.1.2. Receptors

The site-specific receptors that could potentially be affected by the contamination hazards are summarised in Table 5.2.

**Table 5.2: Potential Receptors**

| Receptor | Details |
|---|---|
| **ON SITE** | |
| Site development workers | Site development workers are likely to come into direct contact with the underlying ground conditions during the redevelopment; they may be exposed to ground gases or vapours when working in confined spaces, or to dust or fibres during excavation and |

| Receptor | Details |
|---|---|
| | stockpiling activities, *etc*. |
| Future site users | Future site users (*e.g.*, pupils, staff and visitors) may come into direct contact with the underlying ground conditions in areas of soft landscaping, sports pitches, *etc*.; ground gases may accumulate in void spaces and migrate inside buildings; future site users may also be exposed to dusts or fibres in areas of soft landscaping or sports pitches, *etc*. |
| Adjacent site users | Adjacent site users (*e.g.*, pupils and staff at Birchfields Primary School, residential properties in the vicinity of the site) may be exposed to wind-blown dusts or fibres. |
| Underlying aquifer | Superficial deposits classified as unproductive strata; Bedrock aquifer classified as Principal Aquifer. |
| Construction materials | Buildings materials used below ground, *e.g.*, foundations and services. |
| Flora/fauna | There are large areas of open green space as part of the development for sports pitches, outdoor classrooms, habitat and growing spaces. |
| **OFF SITE** | |
| Local watercourses | Fallowfield Brook is shown approximately 300m south of the site. |
| Adjacent site users and structure | Primary school, housing, railway line, |

### 5.1.3. Pathways

In order for the potential contaminants to pose a risk to the identified receptors, there has to be a viable pathway for the contaminant. The potential pathways are summarised in Table 5.3.

**Table 5.3: Potential Pathways**

| Receptor | Pathway | Comments |
|---|---|---|
| Human health, fauna | Direct contact with contaminated soils | This is likely to be a key pathway across the majority of the site as the development includes sports pitches, habitat growing areas, areas of soft landscaping, *etc*. Robson Liddle identified widespread elevated PAH concentrations in topsoil across the site above the GAC for human health. |
| Human health and fauna | Inhalation of dusts, vapours and fibres | Inhalation of dusts, vapours or fibres is likely to be possible in areas of soft landscaping, sports pitches, *etc*. Any organic material or hydrocarbon impacts identified in soils and groundwater have the potential to generate ground gases which have the potential to migrate and build-up in particular in buildings and confined spaces. |
| Flora | Direct contact with impacted soils and root uptake | This is likely to be a key pathway as there are significant areas of soft landscaping, sports pitches, *etc*., proposed as part of the development. |
| Water environment | Leaching and vertical migration of soil impacts to groundwater | There is a potential for rainfall infiltration, leaching and contaminant migration in open areas of the site. |
| Water environment | Migration of contaminants via groundwater to surface water | The geology is likely to comprise Devensian Till over the Halesowen Formation over the majority of the site with the. Etruria Formation in the north eastern corner of the site. The Devensian Till is unlikely to be significantly |

| Receptor | Pathway | Comments |
|---|---|---|
| | courses and underlying aquifer | permeable, however the Halesowen Formation and Etruria Formation are classified as having variable permeability. The Collyhurst Sandstone in the extreme SW corner of the site is highly permeable. Robson Liddle identified Till to between 8.00mbgl and 10.20mbgl in BH1 and BH2 respectively. The till is likely therefore to provide some protection to the underlying bedrock aquifers. The nearest surface water feature is *Fallowfield Brook* approx. 300m S of the site; it is considered unlikely for potential contamination on site to migrate to this watercourse. |
| Buildings and structures | Damage to building materials or services through direct contact with contaminants or through contaminant migration | Aggressive ground conditions or contaminants such as hydrocarbons may affect subsurface construction materials and in particular water supply pipes. Sulphate concentrations will affect the concrete classification required. |

## 5.2. Qualitative Risk Assessment

Potential pollutant linkages are identified using the source-pathway-receptor framework detailed above. An assessment of the potential significance of each linkage is then made by consideration of the likely magnitude and mobility of the source, the sensitivity of the receptor and nature of the migration/exposure pathways. A visual representation of the Conceptual Site Model is presented as Figure 3.

This qualitative hazard assessment has been undertaken in accordance with NHBC and Environment Agency, 2008. Further details of which are provided in Appendix E including definition of risk categories.

Table 5.4 summarises the pollutant linkages and risk ratings associated with the proposed development.

**Table 5.4: Preliminary Risk Assessment**

| Hazard / Pollutant | Pathway | Receptor | Potential Severity | Probability of Risk | Level of Risk |
|---|---|---|---|---|---|
| Potential asbestos-containing materials (ACMs) in Made Ground | Inhalation/ingestion of fibres/dusts Dermal contact | Site development workers | Severe | Likely | **HIGH** * |
| | | Future site users | Severe | Low Likelihood | **MODERATE** |
| | | Adjacent site users | Severe | Low Likelihood | **MODERATE** |
| Potential metals, hydrocarbons, PAHs, pesticides, herbicides, nitrates, ammonia and pH from previous site use | Dermal contact Ingestion/inhalation of soils/dusts | Site development workers | Medium | Likely | **MODERATE** |
| | | Future site users | Medium | Likely | **MODERATE** |
| | | Adjacent site users | Medium | Unlikely | LOW |
| | Leaching and migration | Aquifer and surface watercourses | Medium | Low Likelihood | **LOW/MODERATE** |
| | Direct contact | Building materials | Mild | Low Likelihood | LOW |
| Ground gases | Ground gas migration | Site development workers | Severe | Low Likelihood | **MODERATE** |
| | | Future site users | Severe | Low Likelihood | **MODERATE** |
| Potential impact to site from migration of mobile contaminants (*e.g.*, PAHs, hydrocarbons) from off-site sources (railway line, bus/tram depot, agricultural land, infilling of ponds and ditches) | Groundwater or ground gas migration | Site development workers Future site users | Medium | Unlikely | LOW |

**Notes:**

Assessment completed assuming site in current condition; should site levels be altered during development, a reassessment would be required;
Assessment completed assuming no remediation/mitigation in place;
Should the development proposals alter significantly a review of this risk assessment may be required; in particular if wider or new areas of soft landscaping / open areas are planned;
* Given the use of appropriate PPE and on-site health and safety precautions, risk to site development workers would be reduced to low.

## 5.3. Summary of Potentially Significant Pollutant Linkages

Table 5.5 below summarises the pollutant linkages requiring further consideration through intrusive site investigation works.

**Table 5.5: Potential Pollutant Linkages Requiring Further Investigation**

| Hazard / Pollutant | Pathway | Receptor | Level of Risk |
|---|---|---|---|
| Potential ACMs in Made Ground | Inhalation/ingestion of fibres/dusts<br>Dermal contact | Site development workers | **HIGH** * |
| | | Future site users | **MODERATE** |
| | | Adjacent site users | **MODERATE** |
| Potential metals, hydrocarbons, PAHs, pesticides, herbicides, nitrates, ammonia and pH from previous site use | Dermal contact<br>Ingestion/inhalation of soils/dusts | Site development workers | **MODERATE** |
| | | Future site users | **MODERATE** |
| | Leaching and migration | Aquifer and surface watercourses | **LOW/MODERATE** |
| Ground gases | Ground gas Migration | Site development workers | **MODERATE** |
| | | Future site users | **MODERATE** |

**Notes:**

Assessment completed assuming site in current condition; should site levels be altered during development, a reassessment would be required;
Assessment completed assuming no remediation/mitigation in place;
Should the development proposals alter significantly a review of this risk assessment may be required; in particular if wider or new areas of soft landscaping / open areas are planned;
* Given the use of appropriate PPE and on-site health and safety precautions, risk to site development workers would be reduced to low.

# 6. PRELIMINARY GEOTECHNICAL ASSESSMENT

The existing ground investigation data and information derived from the available geological maps for the site indicate that there is likely to be between 8.00m to 11.50m of superficial deposits comprising glacial clay underlying the site, which in turn is likely to be underlain by mudstone bedrock.

The available ground investigation data indicates that Made Ground is likely to have originated from various sources. It is considered that the Made Ground will not form a suitable founding stratum for the proposed structures.

The 2015 Robson Liddle investigation indicates the glacial till comprises firm to stiff brown slightly sandy slightly gravelly silty clay, typically encountered at depths of 0.2mbgl to 0.9mbgl; SPT values ranged from 8 to 72 with a general increase in SPT values with depth. Undrained shear strength for the glacial till was assessed using SPT N values and hand shear vane tests, and the characteristic strength at the approximate depth of the proposed foundation level is anticipated to be from 50 kPa at 0.5mbgl increasing to 120 kPa at 2.0mbgl.

Plasticity indices measured during the 2015 Robson Liddle investigation indicate a range from 15% to 30% for the glacial till, with the percentage of the soil <425 µm ranging from 89% to 97%. The compressibility of the glacial till is generally low, indicating that conventional shallow foundations should be appropriate for the proposed two-storey school building.

Site-specific intrusive ground investigation will be required to confirm the findings of the existing investigation and to identify the strength and consolidation properties of the glacial till. Foundation assessments and final design will be undertaken once the proposed investigation completed.

# 7. CONCLUSIONS

The site lies within a largely residential area approximately 5km SE of Manchester City Centre. Previous and current uses of the land lead to a low to moderate risk of potential soil and /or groundwater contamination at the site. The site lies in an area of moderate environmental sensitivity with residential, school and railway land uses adjacent.

A ground investigation was undertaken by Robson Liddle in October 2015; however it is understood that the data from this investigation cannot be relied upon.

Topsoil was encountered in the majority of exploratory holes overlying firm to hard gravelly clays which were underlain by mudstone bedrock. Localised Made Ground was identified in the areas of the former pavilion in the SE area of the site and along the W site boundary in the location of the former tennis courts. TP5 in the centre of the site encountered Made Ground to a depth of 1.90mbgl.

Groundwater was not encountered in any of the exploratory holes during the ground investigation, however during the subsequent monitoring of the wells groundwater was recorded to be between 0.18-1.58mbgl in the period from October to November 2015.

Chemical analysis of soil samples identified widespread elevated concentrations of certain polycyclic aromatic hydrocarbons (PAHs) in topsoil across the whole site, at concentrations that exceed the generic assessment criteria (GAC) for Public Open Space 1 (green space close to housing), which is considered the most realistic GAC for this setting.

There is an *extended culvert* shown on the Envirocheck report approx. 750m NW which extends to approx. 1.2km SE of the site at Broom Lane. The culvert is shown to directly cross under the site from the NW to SE. It is unknown at this stage the depth or exact location of this culvert.

There is potential for asbestos-containing materials on site within the former and current structures, and from fly tipped materials on site.

Overall, potential risks from contaminated land for the proposed development are likely to be moderate due to the large areas of soft landscaping, sports fields, *etc*. with elevated PAH concentrations recorded in the topsoil in the previous ground investigation.

The most significant potential for increased costs of development are in relation to waste classification for disposal of excavated soils off site. Additional intrusive works are required to confirm the Robson Liddle findings and confirm the ground gas regime at the site.

# 8. RECOMMENDATIONS

It is recommended that aground investigation is undertaken. This would be used to obtain information on geotechnical and contaminated land conditions at the site, to confirm the findings of the Robson Liddle 2015 ground investigation, to inform the design and construction of the proposed development, and to identify any mitigation measures or remediation that may be required to reduce the potential risks from ground contamination. Information on contamination is also likely to be required as part of the planning process for the future proposed development of the site.

It is recommended that the geotechnical and contaminated land investigation is combined to reduce costs associated with undertaking these works separately.

The objectives of the intrusive ground investigation would be to:

- Confirm the ground profile;
- Confirm the presence, depth and direction of shallow groundwater flow;
- Characterise the underlying soil, gas and shallow groundwater quality;
- Obtain soil and rock properties for foundation design;
- Assess possible soil waste classifications (should it be necessary to remove material off-site);
- Confirm and develop the conceptual model and the risks associated with contamination.

The scope of the ground investigation will include the following:

- Windowless sampler boreholes to determine shallow ground conditions;
- Cable percussion boreholes to determine deeper ground conditions;
- Hand-excavated pits to confirm the characteristics of the topsoil;
- Soakaway testing to BRE365 to confirm the permeability of the superficial deposits;
- *In situ* testing to determine geotechnical parameters of the soils and rocks on site;
- Installation of monitoring wells in exploratory holes for ground gas and groundwater monitoring and sampling;
- Recovery of soil and groundwater samples for chemical testing;
- Recovery of soil samples for geotechnical laboratory testing;
- Ground gas and groundwater level monitoring;
- Factual reporting; and
- Interpretative Reporting.

If unexpected ground conditions or significant contamination are encountered during the intrusive ground investigation, it may be necessary to extend this investigation or undertake additional ground investigation but the intention would be to avoid this if possible.

The risk from ground gas will need to be confirmed through installation of monitoring wells and a programme of ground gas monitoring comprising six rounds over two months to meet the requirements of current UK ground gas guidance.

The findings of this Desk Study and the recommendations for ground investigation should be discussed with the Contaminated Land Officer prior to undertaking the ground investigation. It is likely that the Local Authority will require, through planning, that any

mitigation or remediation works at the site are fully validated and recorded so that a Verification Report can be compiled. This could also involve the preparation of a Remediation Strategy and/or a Verification Plan following the ground investigation.

# 9. REFERENCES

British Geological Survey (BGS) 1:50,000 scale geological mapping (Solid and Drift editions);

BGS website (www.bgs.ac.uk).

BS 10175; 2011+ A1:2013 Investigation of Potentially Contaminated Sites- Code of Practice

BS EN1997-1:2004 Eurocode 7: Geotechnical design —Part 1: General rules

BS EN1997-2 Eurocode 7: Geotechnical design — Part 2: Ground investigation and testing.

CIRIA C552 (2001) Contaminated land risk assessment, a guide to good practice.

Environment Agency (2004) Model procedures for the management of land contamination. Contaminated land report 11.

Environment Agency (EA) website (www.environment-agency.gov.uk);

Google Maps (2012) www.google.com

NHBC and Environment Agency 2008. Guidance for the Safe Development of Housing on Land Affected by Contamination. R&D Publication 66: 2008

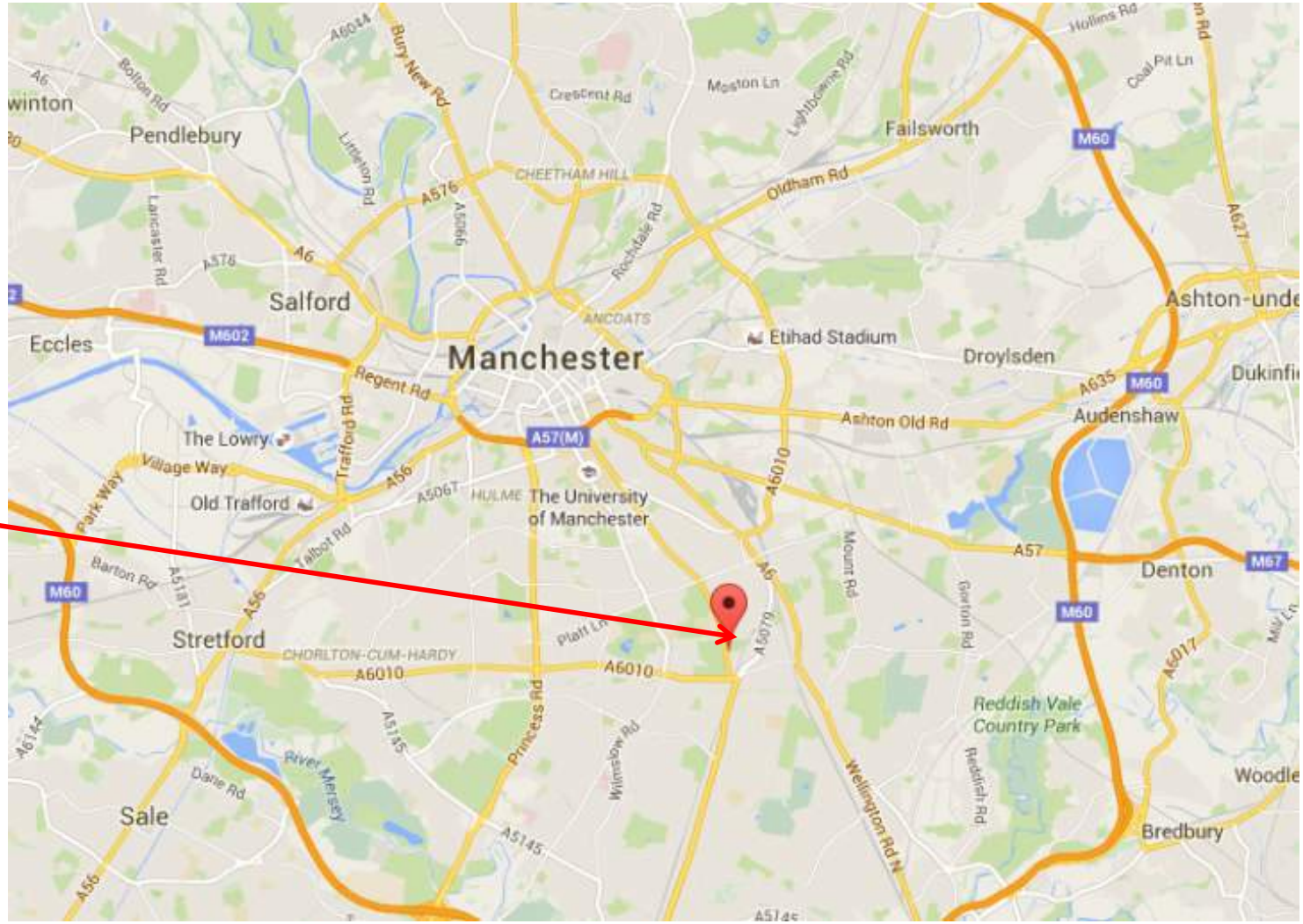
Radon risk maps - http://www.ukradon.org

Zetica Unexploded Ordnance (UXO) Risk Map.

# FIGURES AND DRAWINGS

KEY

Site Location





RAMBOLL ENVIRON

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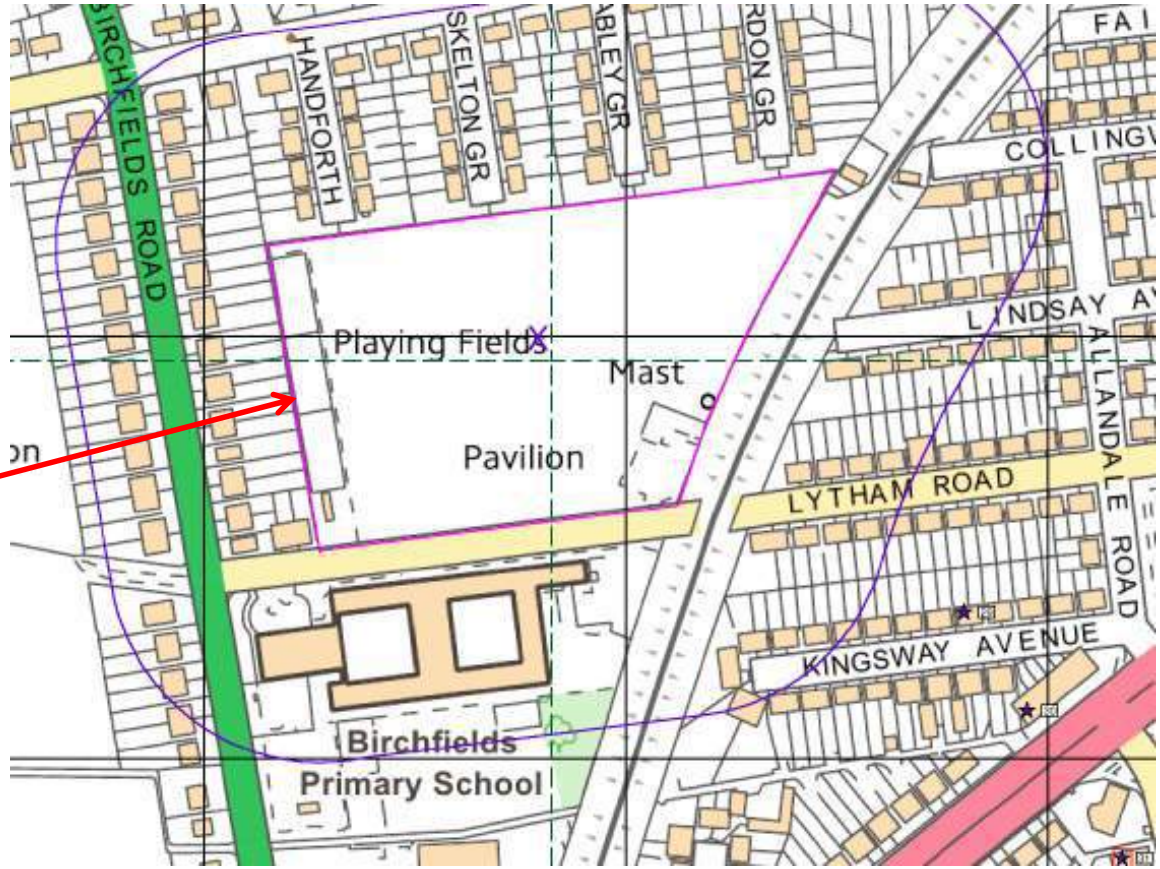
21 The Calls, Leeds, LS2 7EH
**leeds@ramboll.co.uk**
**T: 0113 204 2880**


| | | | | |
|---|---|---|---|---|
| Project: EBN High Schools - Lytham Road, Manchester | Status: | Description: | | Date: Feb 16 |
| Title: Site Location Plan | Scale: NTS | Date: Feb 16 | Drawn: CC | Checked: SR |
| | Figure No: 1 | | | Rev: |

KEY

Site Boundary

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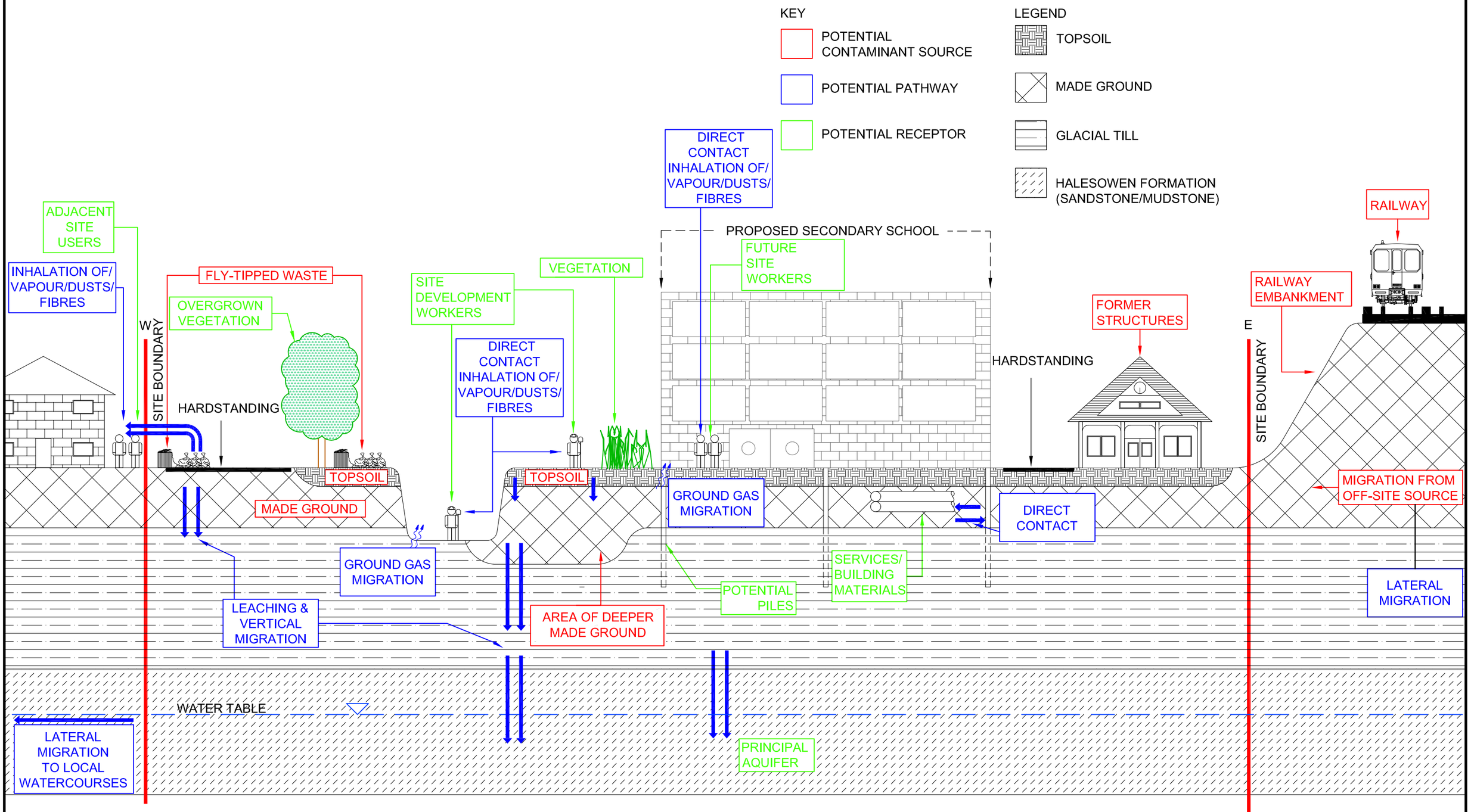
| | | | | |
|---|---|---|---|---|
| Project: EBN High Schools - Lytham Road, Manchester | Status: | Description: | | Date: Feb 16 |
| Title: Site Layout Plan | Scale: NTS | Date: Feb 16 | Drawn: CC | Checked: SR |
| | Figure No: 2 | | | Rev: |




| Rev | Description | Date | By | Chk | App |
|---|---|---|---|---|---|
| - | FOR-INFORMATION | 29/02 2016 | LC | CC | CC |

INFORMATION

# LYTHAM ROAD, MANCHESTER - DESK STUDY

## CONCEPTUAL SITE MODEL

| Scale: | Date: | Drawn: | Checked: |
|---|---|---|---|
| 1:1@A3 | 29/02/2015 | LC | CC |

Drawing No.: FIGURE 3

Rev: -

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www.ramboll.co.uk

# APPENDIX A SITE WALKOVER NOTES AND PHOTOGRAPHS

**Site Walkover – Lytham Road EBN School**

**Date & Time:** 22/02/2016, 9:30 to 10:45 am.

**Weather:** Sunny cold (6 degree) day, with lighter winds, no rain.
**Accompanied with**: Mike Kirwan, Section Manager, Laing O'Rourke Construction North Ltd

No cars or motorcycles are allowed to drive in the Lytham road during Birchfield Primary school start and finish times. A road sign marked at the entrance of the Lytham road, No entry, Mon-Fri, between 8:30 to 9:30 am and 3:00 to 4:00 pm.

Steel bar fenced in four sides of the site and a steel bar gate (entrance) at the south-east corner. All are painted and in very good condition.

The site is flat surface, grass covered, trees and bushes at the site boundaries.
There are derelict, tennis courts (at the west) a cricket pitch in the middle and, building concrete slabs at ground level at the east.

There is a light post at the east (not sure whether live or dead).

I noticed few holes in the ground with tracks, (could be from rabbit, or foxes' or badger's).

There is an equipment room/shed/substation for the Telecom Mast at the East boundary fence, a garage at the South-West corner, an old changing/dressing room at the west boundary fence.

Three gas/water monitoring holes were found on the ground and all of them were locked.

Neighbours from west and north are flies tipping over the fences into the site.

There are several semi-mature/mature trees along the tennis court at the west boundary.

Overhead telephone cable runs from south (Lytham road) to west (Neighbourhood) over the old dressing/changing room.

There is a water line with a tap in the old dressing/changing room, but no running water. Mike Kirwan (Laing O'Rourke) informed me there is a water hydrant at the Lytham road.

I couldn't identify/notice asbestos in my eyes however Mike informed me they (Laing O'Rourke) will undertake an asbestos survey at the old dressing/changing room at the west and at the concrete slabs remains on the ground at the east.

# PHOTOGRAPHIC RECORD OF SITE VISIT
# EBN HIGH SCOOLS - LYTHAM ROAD, MANCHESTER



| Photographic Record | Action /Comment |
|---|---|
| **Photograph 1**<br> | Photograph taken looking north to the residential housing. |
| **Photograph 2**<br> | Photograph taken looking north at the site boundary. Heavily vegetated. |

| Photographic Record | Action /Comment |
|---|---|
| **Photograph 3**<br> | Photograph taken looking at the lighting column along the eastern site boundary, in an area of dense vegetation. |
| **Photograph 4**<br> | Photograph taken looking at the eastern site boundary with the telecommunications mast. |

| Photographic Record | Action /Comment |
|---|---|
| **Photograph 5**<br> | Photograph taken looking north along the eastern site boundary with the telecommunications mast and plant room. |
| **Photograph 6**<br> | Photograph taken looking north east towards the telecommunications mast and plant room. |

| Photographic Record | Action /Comment |
|---|---|
| **Photograph 7**<br> | Photograph taken looking north towards the southern site boundary. |
| **Photograph 8**<br> | Photograph taken looking to the west in the area of the former pavilion. The floor slabs are still intact. |

| Photographic Record | Action /Comment |
|---|---|
| **Photograph 9**<br> | Photograph taken in the centre of the site looking north. The cricket pitch is no longer in use and appears to be overgrown. |
| **Photograph 10**<br> | Photograph taken looking south towards Birchfileds Primary School. |

| Photographic Record | Action /Comment |
|---|---|
| **Photograph 11**<br> | Photograph taken looking east across the southern area of the site. |
| **Photograph 12**<br> | Brick built buildings (former changing room to the left of the photo) in the south western area of the site. |

| Photographic Record | Action /Comment |
|---|---|
| **Photograph 13**<br> | Photograph taken looking towards the south western corner of the site. There are concrete garages. Not known if these are still used. |
| **Photograph 14**<br> | Photograph taken looking east from the western site boundary at what remains of the former tennis courts. |

| Photographic Record | Action /Comment |
|---|---|
| **Photograph 15**<br> | Photograph taken looking west towards the western site boundary in the area of fly tipping. |
| **Photograph 16**<br> | Photograph taken looking west in the area of a previous trial pit. |

# APPENDIX B ENVIROCHECK REPORT

# Envirocheck® Report:

# Datasheet

## Order Details:

**Order Number:**
80427581_1_1

**Customer Reference:**
16200001457

**National Grid Reference:**
386560, 394400

**Slice:**
A

**Site Area (Ha):**
3.21

**Search Buffer (m):**
1000

## Site Details:

Birchfields Primary School
Lytham Road
MANCHESTER
M14 6PL

## Client Details:

Mr S Miller
Ramboll UK Ltd
2nd Floor
The Exchange
Chester
CH 1 1DA

# Contents


| Report Section | Page Number |
|---|---|
| Summary | - |
| Agency & Hydrological | 1 |
| Waste | 13 |
| Hazardous Substances | - |
| Geological | 14 |
| Industrial Land Use | 25 |
| Sensitive Land Use | - |
| Data Currency | 40 |
| Data Suppliers | 45 |
| Useful Contacts | 46 |


**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 maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) 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 Landmark database to a distance defined by the client from 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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**Radon Potential dataset Copyright Notice**


Information supplied from a joint dataset compiled by The British Geological Survey and Public Health England.


**Report Version v50.0**

# Summary

| Data Type | Page Number | On Site | 0 to 250m | 251 to 500m | 501 to 1000m (*up to 2000m) |
|---|---|---|---|---|---|
| **Agency & Hydrological** | | | | | |
| Contaminated Land Register Entries and Notices | | | | | |
| Discharge Consents | pg 1 | | | 1 | 17 |
| Enforcement and Prohibition Notices | | | | | |
| Integrated Pollution Controls | | | | | |
| Integrated Pollution Prevention And Control | | | | | |
| Local Authority Integrated Pollution Prevention And Control | | | | | |
| Local Authority Pollution Prevention and Controls | pg 5 | | | 1 | 5 |
| Local Authority Pollution Prevention and Control Enforcements | | | | | |
| Nearest Surface Water Feature | pg 6 | | | Yes | |
| Pollution Incidents to Controlled Waters | pg 6 | | | 1 | 15 |
| Prosecutions Relating to Authorised Processes | | | | | |
| Prosecutions Relating to Controlled Waters | | | | | |
| Registered Radioactive Substances | | | | | |
| River Quality | pg 9 | | | 1 | 1 |
| River Quality Biology Sampling Points | | | | | |
| River Quality Chemistry Sampling Points | | | | | |
| Substantiated Pollution Incident Register | pg 9 | | | | 1 |
| Water Abstractions | pg 9 | | | | (*11) |
| Water Industry Act Referrals | | | | | |
| Groundwater Vulnerability | pg 11 | Yes | n/a | n/a | n/a |
| Bedrock Aquifer Designations | pg 12 | Yes | n/a | n/a | n/a |
| Superficial Aquifer Designations | pg 12 | Yes | n/a | n/a | n/a |
| Source Protection Zones | pg 12 | | 1 | | |
| Extreme Flooding from Rivers or Sea without Defences | | | | n/a | n/a |
| Flooding from Rivers or Sea without Defences | | | | n/a | n/a |
| Areas Benefiting from Flood Defences | | | | n/a | n/a |
| Flood Water Storage Areas | | | | n/a | n/a |
| Flood Defences | | | | n/a | n/a |
| Detailed River Network Lines | pg 12 | Yes | | | n/a |
| Detailed River Network Offline Drainage | | | | | n/a |

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# Summary

| Data Type | Page Number | On Site | 0 to 250m | 251 to 500m | 501 to 1000m (*up to 2000m) |
|---|---|---|---|---|---|
| **Waste** | | | | | |
| BGS Recorded Landfill Sites | | | | | |
| Historical Landfill Sites | | | | | |
| Integrated Pollution Control Registered Waste Sites | | | | | |
| Licensed Waste Management Facilities (Landfill Boundaries) | | | | | |
| Licensed Waste Management Facilities (Locations) | | | | | |
| Local Authority Recorded Landfill Sites | | | | | |
| Registered Landfill Sites | | | | | |
| Registered Waste Transfer Sites | | | | | |
| Registered Waste Treatment or Disposal Sites | | | | | |
| **Hazardous Substances** | | | | | |
| Control of Major Accident Hazards Sites (COMAH) | | | | | |
| Explosive Sites | | | | | |
| Notification of Installations Handling Hazardous Substances (NIHHS) | | | | | |
| Planning Hazardous Substance Consents | | | | | |
| Planning Hazardous Substance Enforcements | | | | | |
| **Geological** | | | | | |
| BGS 1:625,000 Solid Geology | pg 14 | Yes | n/a | n/a | n/a |
| BGS Estimated Soil Chemistry | pg 14 | Yes | Yes | Yes | Yes |
| BGS Recorded Mineral Sites | | | | | |
| BGS Urban Soil Chemistry | pg 23 | | | | Yes |
| BGS Urban Soil Chemistry Averages | pg 24 | | Yes | | |
| Brine Compensation Area | | | n/a | n/a | n/a |
| Coal Mining Affected Areas | | | n/a | n/a | n/a |
| Mining Instability | | | n/a | n/a | n/a |
| Man-Made Mining Cavities | | | | | |
| Natural Cavities | | | | | |
| Non Coal Mining Areas of Great Britain | pg 24 | Yes | | n/a | n/a |
| Potential for Collapsible Ground Stability Hazards | pg 24 | Yes | | n/a | n/a |
| Potential for Compressible Ground Stability Hazards | | | | n/a | n/a |
| Potential for Ground Dissolution Stability Hazards | | | | n/a | n/a |
| Potential for Landslide Ground Stability Hazards | pg 24 | Yes | | n/a | n/a |
| Potential for Running Sand Ground Stability Hazards | pg 24 | Yes | | n/a | n/a |
| Potential for Shrinking or Swelling Clay Ground Stability Hazards | pg 24 | Yes | | n/a | n/a |
| Radon Potential - Radon Affected Areas | | | n/a | n/a | n/a |
| Radon Potential - Radon Protection Measures | | | n/a | n/a | n/a |

# Summary

| Data Type | Page Number | On Site | 0 to 250m | 251 to 500m | 501 to 1000m (*up to 2000m) |
|---|---|---|---|---|---|
| **Industrial Land Use** | | | | | |
| Contemporary Trade Directory Entries | pg 25 | | 3 | 25 | 132 |
| Fuel Station Entries | pg 38 | | | 1 | 4 |
| **Sensitive Land Use** | | | | | |
| 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 | | | | | |
| Nitrate Sensitive Areas | | | | | |
| Nitrate Vulnerable Zones | | | | | |
| Ramsar Sites | | | | | |
| Sites of Special Scientific Interest | | | | | |
| Special Areas of Conservation | | | | | |
| Special Protection Areas | | | | | |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 1 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: Victoria Road/Osbourne Ro, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 01MAN0379<br>Permit Version: 1<br>Effective Date: 1st January 1995<br>Issued Date: Not Supplied<br>Revocation Date: Not Supplied<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge Environment: Unknown<br>Receiving Water: Not Supplied<br>**Status: Not Supplied**<br>Positional Accuracy: Located by supplier to within 100m | A14SW (SE) | 369 | 3 | 386970 394190 |
| 2 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: Beresford Rd/Farrer Rd, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 01MAN0389<br>Permit Version: 1<br>Effective Date: 1st January 1995<br>Issued Date: Not Supplied<br>Revocation Date: 12th December 2014<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge Environment: Unknown<br>Receiving Water: Not Supplied<br>**Status: Not Supplied**<br>Positional Accuracy: Located by supplier to within 100m | A18SE (N) | 526 | 3 | 386641 395001 |
| 3 | **Discharge Consents**<br>Operator: Barratt Manchester Ltd<br>Property Type: Hospitals<br>Location: Former Duchess Of York Hospital Cringle Lane, Burnage, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 016991372<br>Permit Version: 1<br>Effective Date: 1st November 1994<br>Issued Date: Not Supplied<br>Revocation Date: 1st November 1994<br>Discharge Type: Discharge Of Other Matter-Surface Water<br>Discharge Environment: Into And/Or Watercourse<br>Receiving Water: Unnamed Watercourse O/F2<br>**Status: Not Supplied**<br>Positional Accuracy: Located by supplier to within 100m | A8SE (S) | 712 | 3 | 386600 393600 |
| 3 | **Discharge Consents**<br>Operator: Barratt Manchester Ltd<br>Property Type: Hospitals<br>Location: Former Duchess Of York Hospital Cringle Lane, Burnage, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 016991371<br>Permit Version: 1<br>Effective Date: 1st November 1994<br>Issued Date: Not Supplied<br>Revocation Date: 1st November 1994<br>Discharge Type: Discharge Of Other Matter-Surface Water<br>Discharge Environment: Canal<br>Receiving Water: The Peak Forest Canal<br>**Status: Not Supplied**<br>Positional Accuracy: Located by supplier to within 100m | A8SE (S) | 712 | 3 | 386600 393600 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 4 | **Discharge Consents**<br>Operator: Barratt Manchester Ltd<br>Property Type: Hospitals<br>Location: Former Duchess Of York Hospital Cringle Lane, Burnage, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 016991373<br>Permit Version: 1<br>Effective Date: 1st November 1994<br>Issued Date: Not Supplied<br>Revocation Date: 1st November 1994<br>Discharge Type: Discharge Of Other Matter-Surface Water<br>Discharge Environment: Canal<br>Receiving Water: The Peak Forest Canal<br>**Status: Not Supplied**<br>Positional Accuracy: Located by supplier to within 100m | A8SE (S) | 724 | 3 | 386700 393600 |
| 4 | **Discharge Consents**<br>Operator: Barratt Manchester Ltd<br>Property Type: Hospitals<br>Location: Former Duchess Of York Hospital Cringle Lane, Burnage, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 016991374<br>Permit Version: 1<br>Effective Date: 1st November 1994<br>Issued Date: Not Supplied<br>Revocation Date: 1st November 1994<br>Discharge Type: Discharge Of Other Matter-Surface Water<br>Discharge Environment: Canal<br>Receiving Water: The Peak Forest Canal<br>**Status: Not Supplied**<br>Positional Accuracy: Located by supplier to within 100m | A8SE (S) | 724 | 3 | 386700 393600 |
| 5 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: Birch Hall Ln/Thoresway Rd, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Supplied<br>Reference: 01man0245<br>Permit Version: 2<br>Effective Date: 3rd September 2010<br>Issued Date: 3rd September 2010<br>Revocation Date: Not Supplied<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge Environment: Freshwater Stream/River<br>Receiving Water: Gore Brook<br>**Status: Not Supplied**<br>Positional Accuracy: Located by supplier to within 10m | A18NW (N) | 734 | 3 | 386330 395170 |
| 5 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: Birch Hall Ln/Thoresway Rd, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 01MAN0245<br>Permit Version: 1<br>Effective Date: 1st January 1995<br>Issued Date: Not Supplied<br>Revocation Date: 2nd September 2010<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge Environment: Freshwater Stream/River<br>Receiving Water: Gore Brook<br>**Status: Not Supplied**<br>Positional Accuracy: Located by supplier to within 10m | A18NW (N) | 734 | 3 | 386330 395170 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
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| 6 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Pumping Station - Water Company<br>Location: Thorsway/Birchfield Rd, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 01man0242<br>Permit Version: 1<br>Effective Date: 15th September 1993<br>Issued Date: Not Supplied<br>Revocation Date: 15th September 1993<br>Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company<br>Discharge Environment: Freshwater Stream/River<br>Receiving Water: Gore Brook<br>**Status: Not Supplied**<br>Positional Accuracy: Located by supplier to within 100m | A17NE (NW) | 745 | 3 | 386120 395120 |
| 6 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: Dickenson Road Sso, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 016982725<br>Permit Version: 1<br>Effective Date: 30th September 1994<br>Issued Date: Not Supplied<br>Revocation Date: Not Supplied<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge Environment: Freshwater Stream/River<br>Receiving Water: Gore Brook<br>**Status: Not Supplied**<br>Positional Accuracy: Located by supplier to within 100m | A17NE (NW) | 752 | 3 | 386115 395125 |
| 6 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: Thoresway Road/Birchfields Road Cso, Thoresway Road/Birchfields Road, Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Supplied<br>Reference: 016942046<br>Permit Version: 2<br>Effective Date: 5th May 2006<br>Issued Date: 5th May 2006<br>Revocation Date: 27th March 2015<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge Environment: Freshwater Stream/River<br>Receiving Water: Gore Brook<br>**Status: Not Supplied**<br>Positional Accuracy: Located by supplier to within 10m | A17NE (NW) | 754 | 3 | 386120 395130 |
| 6 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: Dickenson Road Sso, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 01man0297<br>Permit Version: 1<br>Effective Date: 1st January 1995<br>Issued Date: Not Supplied<br>Revocation Date: 1st January 1995<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge Environment: Freshwater Stream/River<br>Receiving Water: Gore Brook<br>**Status: Not Supplied**<br>Positional Accuracy: Located by supplier to within 100m | A17NE (NW) | 754 | 3 | 386110 395125 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 6 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: Dickenson Road Sso, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 016942046<br>Permit Version: 1<br>Effective Date: 6th October 1986<br>Issued Date: 6th October 1986<br>Revocation Date: 4th May 2006<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge Environment: Freshwater Stream/River<br>Receiving Water: Gore Brook<br>**Status: Not Supplied**<br>Positional Accuracy: Located by supplier to within 100m | A17NE (NW) | 758 | 3 | 386110 395130 |
| 7 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewage Disposal Works - Water Company<br>Location: Dickenson/Beresford Rd, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 01MAN0234<br>Permit Version: 2<br>Effective Date: 1st January 1995<br>Issued Date: Not Supplied<br>Revocation Date: 30th June 2004<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge Environment: Unknown<br>Receiving Water: Not Supplied<br>**Status: Not Supplied**<br>Positional Accuracy: Located by supplier to within 100m | A18NW (N) | 765 | 3 | 386550 395230 |
| 7 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewage Disposal Works - Water Company<br>Location: Dickenson/Beresford Rd, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Supplied<br>Reference: 01man0234<br>Permit Version: 1<br>Effective Date: 1st April 1991<br>Issued Date: Not Supplied<br>Revocation Date: 31st December 1994<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge Environment: Not Supplied<br>Receiving Water: Not Supplied<br>**Status: Not Supplied**<br>Positional Accuracy: Located by supplier to within 10m | A18NW (N) | 765 | 3 | 386550 395230 |
| 7 | **Discharge Consents**<br>Operator: United Utilities Water Plc (?)<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: Beresford Road Sso Beresford Road, Rusholme, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Supplied<br>Reference: 016942057<br>Permit Version: 2<br>Effective Date: 30th June 2004<br>Issued Date: 30th June 2004<br>Revocation Date: Not Supplied<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge Environment: Freshwater Stream/River<br>Receiving Water: Gore Brook<br>**Status: Not Supplied**<br>Positional Accuracy: Located by supplier to within 10m | A18NW (N) | 775 | 3 | 386550 395240 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
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| 7 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: Beresford Road Sso Beresford Road, Rusholme, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 016942057<br>Permit Version: 1<br>Effective Date: Not Supplied<br>Issued Date: Not Supplied<br>Revocation Date: 29th June 2004<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge Environment: Freshwater Stream/River<br>Receiving Water: Gore Brook<br>**Status: Not Supplied**<br>Positional Accuracy: Located by supplier to within 100m | A18NW (N) | 775 | 3 | 386550 395240 |
| 8 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Pumping Station - Water Company<br>Location: Holland St/Butler St, Sso, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 01man0036<br>Permit Version: 1<br>Effective Date: 15th September 1993<br>Issued Date: Not Supplied<br>Revocation Date: 15th September 1993<br>Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company<br>Discharge Environment: Freshwater Stream/River<br>Receiving Water: River Medlock<br>**Status: Not Supplied**<br>Positional Accuracy: Located by supplier to within 100m | A7SE (SW) | 981 | 3 | 385980 393440 |
| 9 | **Local Authority Pollution Prevention and Controls**<br>Name: Birchfields Service Station<br>Location: Moseley Road/Birchfields Road, Fallowfield, MANCHESTER, Lancashire, M14 6PN<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/PFS/RM/010/06<br>Dated: 22nd December 1998<br>Process Type: Local Authority Air Pollution Control<br>Description: PG1/14 Petrol filling station<br>**Status: Authorisation revokedRevoked**<br>Positional Accuracy: Manually positioned to the address or location | A8NW (S) | 355 | 4 | 386428 393945 |
| 10 | **Local Authority Pollution Prevention and Controls**<br>Name: Crowcroft Service Station<br>Location: 691 Stockport Road, Longsight, MANCHESTER, Lancashire, M12 4QN<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PFS/42/98-99<br>Dated: 25th March 1999<br>Process Type: Local Authority Air Pollution Control<br>Description: PG1/14 Petrol filling station<br>**Status: Authorisation revokedRevoked**<br>Positional Accuracy: Located by supplier to within 10m | A19SE (NE) | 716 | 4 | 387330 394817 |
| 11 | **Local Authority Pollution Prevention and Controls**<br>Name: Regal Dry Cleaners<br>Location: 986 Stockport Road, Levenshulme, Manchester<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/DC/RM/27/08<br>Dated: 10th March 2008<br>Process Type: Local Authority Pollution Prevention and Control<br>Description: PG6/46 Dry cleaning<br>**Status: Authorisation revokedRevoked**<br>Positional Accuracy: Located by supplier to within 10m | A9NE (SE) | 835 | 4 | 387402 394016 |
| 12 | **Local Authority Pollution Prevention and Controls**<br>Name: S Marshall Motor Engineers<br>Location: 65-67 Ladybarn Lane, MANCHESTER, Lancashire, M14 6YL<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/B/16/05/AW<br>Dated: 16th September 1991<br>Process Type: Local Authority Air Pollution Control<br>Description: PG1/1Waste oil burners, less than 0.4MW net rated thermal input<br>**Status: Authorised**<br>Positional Accuracy: Manually positioned to the address or location | A7SE (SW) | 909 | 4 | 385911 393570 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 13 | **Local Authority Pollution Prevention and Controls**<br>Name: Mr Bubbles<br>Location: 246 Wilmslow Road, Fallowfield, Manchester<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/DC/RM/16/07<br>Dated: 12th February 2007<br>Process Type: Local Authority Pollution Prevention and Control<br>Description: PG6/46 Dry cleaning<br>**Status: Permitted**<br>Positional Accuracy: Located by supplier to within 10m | A12SW (W) | 921 | 4 | 385556 394101 |
| 14 | **Local Authority Pollution Prevention and Controls**<br>Name: Mucky Maureen'S Wash House<br>Location: 338 Dickenson Road, Longsight, Manchester, M13 0ng<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/DC/RM/27/11<br>Dated: 19th April 2011<br>Process Type: Local Authority Pollution Prevention and Control<br>Description: PG6/46 Dry cleaning<br>**Status: Permitted**<br>Positional Accuracy: Manually positioned to the address or location | A23SE (N) | 949 | 4 | 386601 395422 |
| | **Nearest Surface Water Feature** | A13NE (NE) | 306 | - | 386897 394713 |
| 15 | **Pollution Incidents to Controlled Waters**<br>Property Type: Connection To Surface Drains<br>Location: Location Description Not Available<br>Authority: Environment Agency, North West Region<br>Pollutant: Miscellaneous - Other<br>Note: Fallowfield Brook; Sink Waste<br>Incident Date: 11th June 1991<br>Incident Reference: 91640922<br>Catchment Area: Mersey - Non-Tidal<br>Receiving Water: Not Given<br>Cause of Incident: Unknown<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A13SE (SE) | 353 | 3 | 386900 394100 |
| 16 | **Pollution Incidents to Controlled Waters**<br>Property Type: Private Sewage (Non-PLC): Sewerage Systems<br>Location: Location Description Not Available<br>Authority: Environment Agency, North West Region<br>Pollutant: Unknown Sewage<br>Note: Cringle Brook<br>Incident Date: 22nd April 1992<br>Incident Reference: 92640653<br>Catchment Area: Mersey - Non-Tidal<br>Receiving Water: Not Given<br>Cause of Incident: Unknown<br>Incident Severity: Category 2 - Significant Incident<br>Positional Accuracy: Located by supplier to within 100m | A8SW (S) | 600 | 3 | 386500 393700 |
| 16 | **Pollution Incidents to Controlled Waters**<br>Property Type: Connection To Surface Drains<br>Location: Location Description Not Available<br>Authority: Environment Agency, North West Region<br>Pollutant: Unknown Sewage<br>Note: Cringle Brook<br>Incident Date: 30th May 1992<br>Incident Reference: 92640900<br>Catchment Area: Mersey - Non-Tidal<br>Receiving Water: Not Given<br>Cause of Incident: Unknown<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A8SW (S) | 605 | 3 | 386500 393695 |
| 17 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Location Description Not Available<br>Authority: Environment Agency, North West Region<br>Pollutant: Oils - Diesel (Including Agricultural)<br>Note: Chorlton Brook<br>Incident Date: 5th March 1995<br>Incident Reference: 95640450<br>Catchment Area: Mersey - Non-Tidal<br>Receiving Water: Not Given<br>Cause of Incident: Other Incident/Unknown<br>Incident Severity: Category 2 - Significant Incident<br>Positional Accuracy: Located by supplier to within 100m | A7NE (SW) | 684 | 3 | 385900 393900 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
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| 18 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Location Description Not Available<br>Authority: Environment Agency, North West Region<br>Pollutant: Mud/Clay/Soil<br>Note: Gore Brook<br>Incident Date: 17th December 1991<br>Incident Reference: 91642011<br>Catchment Area: Mersey - Non-Tidal<br>Receiving Water: Not Given<br>Cause of Incident: Unknown<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A17SW (NW) | 718 | 3 | 385805 394795 |
| 18 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Location Description Not Available<br>Authority: Environment Agency, North West Region<br>Pollutant: Oils - Unknown<br>Note: Gore Brook<br>Incident Date: 3rd September 1993<br>Incident Reference: 93641726<br>Catchment Area: Mersey - Non-Tidal<br>Receiving Water: Not Given<br>Cause of Incident: Unknown<br>Incident Severity: Category 2 - Significant Incident<br>Positional Accuracy: Located by supplier to within 100m | A17SW (NW) | 722 | 3 | 385800 394795 |
| 18 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Location Description Not Available<br>Authority: Environment Agency, North West Region<br>Pollutant: Miscellaneous - Inert Suspended Solids<br>Note: Gore Brook<br>Incident Date: 23rd April 1992<br>Incident Reference: 92640667<br>Catchment Area: Mersey - Non-Tidal<br>Receiving Water: Not Given<br>Cause of Incident: Unknown<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A17SW (NW) | 725 | 3 | 385800 394800 |
| 19 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Greater Manchester<br>Authority: Environment Agency, North West Region<br>Pollutant: Unknown<br>Note: Platt Brook; No Pollution Found<br>Incident Date: 20th April 1994<br>Incident Reference: 94640746<br>Catchment Area: Mersey - Non-Tidal<br>Receiving Water: Not Given<br>Cause of Incident: Other Incident/Unknown<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A17NE (NW) | 729 | 3 | 386105 395095 |
| 19 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Greater Manchester<br>Authority: Environment Agency, North West Region<br>Pollutant: Unknown<br>Note: None Affected; Petrol Reported<br>Incident Date: 2nd September 1996<br>Incident Reference: 96642006<br>Catchment Area: Mersey - Non-Tidal<br>Receiving Water: Not Given<br>Cause of Incident: Other Incident/Unknown<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A17NE (NW) | 731 | 3 | 386100 395095 |
| 19 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Location Description Not Available<br>Authority: Environment Agency, North West Region<br>Pollutant: Oils - Unknown<br>Note: Not Supplied<br>Incident Date: 28th September 1995<br>Incident Reference: 95642420<br>Catchment Area: Mersey - Non-Tidal<br>Receiving Water: Not Given<br>Cause of Incident: Deliberate Disposal To Drain<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A17NE (NW) | 736 | 3 | 386100 395100 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
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| 20 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Greater Manchester<br>Authority: Environment Agency, North West Region<br>Pollutant: Miscellaneous - Fire water / Foam<br>Note: Fire Water<br>Incident Date: 18th February 1996<br>Incident Reference: 96630294<br>Catchment Area: Mersey - Non-Tidal<br>Receiving Water: Not Given<br>Cause of Incident: Fire<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A14NE (E) | 735 | 3 | 387400 394700 |
| 21 | **Pollution Incidents to Controlled Waters**<br>Property Type: Spillage; Accident In Transit<br>Location: Greater Manchester<br>Authority: Environment Agency, North West Region<br>Pollutant: Oils - Petrol<br>Note: Platt Brook; Petrol<br>Incident Date: 6th November 1996<br>Incident Reference: 96642295<br>Catchment Area: Mersey - Non-Tidal<br>Receiving Water: Not Given<br>Cause of Incident: Road Traffic Accident<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A12NW (W) | 833 | 3 | 385600 394500 |
| 22 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Greater Manchester<br>Authority: Environment Agency, North West Region<br>Pollutant: Not Given<br>Note: None Pollution Found<br>Incident Date: 10th November 1992<br>Incident Reference: 92641942<br>Catchment Area: Mersey - Non-Tidal<br>Receiving Water: Not Given<br>Cause of Incident: Not Given<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A14SE (E) | 848 | 3 | 387500 394200 |
| 23 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Gore Brook, Platt Fields And Birchfield Park<br>Authority: Environment Agency, North West Region<br>Pollutant: Miscellaneous - Inert Suspended Solids<br>Note: Cloudy<br>Incident Date: 26th January 1998<br>Incident Reference: SO980171<br>Catchment Area: Mersey - Non-Tidal<br>Receiving Water: Freshwater Stream/River<br>Cause of Incident: Other Cause<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A17NE (NW) | 871 | 3 | 386000 395200 |
| 24 | **Pollution Incidents to Controlled Waters**<br>Property Type: Connection To Surface Drains<br>Location: Location Description Not Available<br>Authority: Environment Agency, North West Region<br>Pollutant: Miscellaneous - Other<br>Note: Cringle Brook<br>Incident Date: 3rd April 1991<br>Incident Reference: 91640840<br>Catchment Area: Mersey - Non-Tidal<br>Receiving Water: Not Given<br>Cause of Incident: Unknown<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A9SW (SE) | 922 | 3 | 387200 393600 |
| 25 | **Pollution Incidents to Controlled Waters**<br>Property Type: Nursing Home/Residential<br>Location: LEVENSHULME<br>Authority: Environment Agency, North West Region<br>Pollutant: Chemicals - Acid<br>Note: Cringle Bk; Nitric Acid<br>Incident Date: 22nd January 1997<br>Incident Reference: 97640118<br>Catchment Area: Mersey - Non-Tidal<br>Receiving Water: Freshwater Stream/River<br>Cause of Incident: Accidental Spillage/Leakage<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A9SE (SE) | 993 | 3 | 387400 393700 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
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| | **River Quality**<br>Name: Fallowfield Bk<br>GQA Grade: River Quality C<br>Reach: Qsl At North Reddish To Chorlton Bk<br>Estimated Distance (km): 4.7<br>Flow Rate: Flow less than 0.31 cumecs<br>Flow Type: River<br>Year: 2000 | A8NE (S) | 297 | 3 | 386653 394021 |
| | **River Quality**<br>Name: Chorlton Bk<br>GQA Grade: River Quality B<br>Reach: Qsl At Tan Yard Brow To Cringle Bk<br>Estimated Distance (km): 5.9<br>Flow Rate: Flow less than 0.31 cumecs<br>Flow Type: River<br>Year: 2000 | A18SW (N) | 575 | 3 | 386406 395022 |
| 26 | **Substantiated Pollution Incident Register**<br>Authority: Environment Agency - North West Region, South Area<br>Incident Date: 12th April 2013<br>Incident Reference: 1101954<br>Water Impact: Category 2 - Significant Incident<br>Air Impact: Category 4 - No Impact<br>Land Impact: Category 4 - No Impact<br>Positional Accuracy: Located by supplier to within 10m<br>Pollutant: Inorganic Chemicals : Other | A17SW (W) | 874 | 3 | 385616 394759 |
| | **Water Abstractions**<br>Operator: Ocs Group Uk Ltd T/A Cannon<br>Licence Number: 2569013021<br>Permit Version: 2<br>Location: Burnage Lane , Levenshulme, Manchester<br>Authority: Environment Agency, North West Region<br>Abstraction: Industrial; Commercial And Public Services: Laundry Use<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Burnage Lane, Levenshulme<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 17th January 2008<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A3SE (S) | 1491 | 3 | 386720 392830 |
| | **Water Abstractions**<br>Operator: Cannon Hygiene Limited<br>Licence Number: 2569013021<br>Permit Version: 1<br>Location: Burnage Lane , Levenshulme, Manchester<br>Authority: Environment Agency, North West Region<br>Abstraction: Industrial; Commercial And Public Services: Laundry Use<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Burnage Lane, Levenshulme<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 19th March 2004<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A3SE (S) | 1491 | 3 | 386720 392830 |
| | **Water Abstractions**<br>Operator: Mr Clive Back<br>Licence Number: 2569006042<br>Permit Version: 3<br>Location: Permo-Triassic Sandstone At Belle Vue Leisure Centre<br>Authority: Environment Agency, North West Region<br>Abstraction: Sports Grounds/Facilities: Spray Irrigation - Direct<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Land At Belle Vue Leisure Centre<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 4th February 2009<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A25NW (NE) | 1669 | 3 | 387590 395890 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Water Abstractions**<br>Operator: Manchester City Council<br>Licence Number: 2569006042<br>Permit Version: 2<br>Location: Permo-Triassic Sandstone At Belle Vue Leisure Centre<br>Authority: Environment Agency, North West Region<br>Abstraction: Sports Grounds/Facilities: Spray Irrigation - Direct<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Land At Belle Vue Leisure Centre<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 29th November 2005<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A25NW (NE) | 1669 | 3 | 387590 395890 |
| | **Water Abstractions**<br>Operator: Manchester City Council<br>Licence Number: 2569006042<br>Permit Version: 1<br>Location: Permo-Triassic Sandstone At Belle Vue Leisure Centre<br>Authority: Environment Agency, North West Region<br>Abstraction: Sports Grounds/Facilities: Spray Irrigation - Direct<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Land At Belle Vue Leisure Centre<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 11th July 2002<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A25NW (NE) | 1669 | 3 | 387590 395890 |
| | **Water Abstractions**<br>Operator: The Chief Operating Officer Of The Eastlands Trust<br>Licence Number: Nw/069/0006/006<br>Permit Version: 1<br>Location: Permo-Triassic Sandstone At Belle Vue Leisure Centre<br>Authority: Environment Agency, North West Region<br>Abstraction: Sports Grounds/Facilities: Spray Irrigation - Direct<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Land At Belle Vue Leisure Centre<br>Authorised Start: 01 April<br>Authorised End: 31 March<br>Permit Start Date: 16th May 2014<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A25NW (NE) | 1670 | 3 | 387591 395891 |
| | **Water Abstractions**<br>Operator: Mr Clive Back<br>Licence Number: 2569006042<br>Permit Version: 4<br>Location: Permo-Triassic Sandstone At Belle Vue Leisure Centre<br>Authority: Environment Agency, North West Region<br>Abstraction: Sports Grounds/Facilities: Spray Irrigation - Direct<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Land At Belle Vue Leisure Centre<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 29th February 2012<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A25NW (NE) | 1670 | 3 | 387591 395891 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Water Abstractions**<br>Operator: Cba Enterprises Ltd<br>Licence Number: 2569013018<br>Permit Version: 100<br>Location: Borehole At Sandfold Lane Levenshulme Manchester<br>Authority: Environment Agency, North West Region<br>Abstraction: Other Industrial/Commercial/Public Services: General Use (Medium Loss)<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): 409<br>Yearly Rate (m3): 117835<br>Details: Land & Prems At Sandfold Lane<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 29th March 1996<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | (E) | 1814 | 3 | 388500<br>394700 |
| | **Water Abstractions**<br>Operator: United Biscuits (Uk) Limited<br>Licence Number: 2569011040<br>Permit Version: 1<br>Location: Borehole At Crossley Rd Levenshulme<br>Authority: Environment Agency, North West Region<br>Abstraction: Food And Drink: General Use (Medium Loss)<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 April<br>Authorised End: 31 March<br>Permit Start Date: 3rd October 2008<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A5SE (SE) | 1994 | 3 | 387960<br>392840 |
| | **Water Abstractions**<br>Operator: United Biscuits (Uk) Limited<br>Licence Number: 2569011037<br>Permit Version: 101<br>Location: Borehole At Crossley Rd Levenshulme<br>Authority: Environment Agency, North West Region<br>Abstraction: Food And Drink: General Use (Medium Loss)<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Land At Crossley Road Levenshulme<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 1st January 2006<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A5SE (SE) | 1994 | 3 | 387960<br>392840 |
| | **Water Abstractions**<br>Operator: Mcvities Uk<br>Licence Number: 2569011037<br>Permit Version: 100<br>Location: Borehole At Crossley Rd Levenshulme<br>Authority: Environment Agency, North West Region<br>Abstraction: Food And Drink: General Use (Medium Loss)<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): 700<br>Yearly Rate (m3): 170000<br>Details: Land At Crossley Road Levenshulme<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 16th March 1998<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A5SE (SE) | 1994 | 3 | 387960<br>392840 |
| | **Groundwater Vulnerability**<br>Soil Classification: Soils of High Leaching Potential (U) - Soil information for restored mineral workings and urban areas is based on fewer observations than elsewhere. A worst case vulnerability classification (H) assumed, until proved otherwise<br>Map Sheet: Sheet 17 Derbyshire & North Staffordshire<br>Scale: 1:100,000 | A13SW (SW) | 0 | 3 | 386476<br>394316 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Groundwater Vulnerability**<br>Soil Classification: Soils of High Leaching Potential (U) - Soil information for restored mineral workings and urban areas is based on fewer observations than elsewhere. A worst case vulnerability classification (H) assumed, until proved otherwise<br>Map Sheet: Sheet 17 Derbyshire & North Staffordshire<br>Scale: 1:100,000 | A13NW (W) | 0 | 3 | 386559 394399 |
| | **Drift Deposits**<br>Drift Deposit: Low permeability drift deposits occuring at the surface and overlying Major and Minor Aquifers are head, clay-with-flints, brickearth, peat, river terrace deposits and marine and estuarine alluvium<br>Map Sheet: Sheet 17 Derbyshire & North Staffordshire<br>Scale: 1:100,000 | A13NW (W) | 0 | 3 | 386559 394399 |
| | **Bedrock Aquifer Designations**<br>Aquifer Designation: Secondary Aquifer - A | A13NW (W) | 0 | 2 | 386559 394399 |
| | **Bedrock Aquifer Designations**<br>Aquifer Designation: Principal Aquifer | A13SW (W) | 0 | 2 | 386449 394355 |
| | **Superficial Aquifer Designations**<br>Aquifer Designation: Unproductive Strata | A13NW (W) | 0 | 2 | 386559 394399 |
| 27 | **Source Protection Zones**<br>Name: Moss Side<br>Source: Environment Agency, Head Office<br>Reference: Nw097<br>Type: Zone III (Total Catchment): The total area needed to support the discharge from the protected groundwater source. | A13SW (W) | 22 | 3 | 386419 394385 |
| | **Extreme Flooding from Rivers or Sea without Defences**<br>None | | | | |
| | **Flooding from Rivers or Sea without Defences**<br>None | | | | |
| | **Areas Benefiting from Flood Defences**<br>None | | | | |
| | **Flood Water Storage Areas**<br>None | | | | |
| | **Flood Defences**<br>None | | | | |
| 28 | **Detailed River Network Lines**<br>River Type: Extended Culvert (greater than 50m)<br>River Name: Not Supplied<br>Hydrographic Area: D011<br>River Flow Type: Primary Flow Path<br>River Surface Level: Below Surface<br>Drain Feature: Not a Drain<br>Flood Risk Management Status: Other Rivers<br>Water Course Name: Not Supplied<br>Water Course Reference: Not Supplied | A13NE (N) | 0 | 3 | 386568 394425 |
| | **Detailed River Network Offline Drainage**<br>None | | | | |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Local Authority Landfill Coverage**<br>Name: Manchester City Council<br>- Had landfill data but passed it to the relevant environment agency | | 0 | 8 | 386559<br>394399 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS 1:625,000 Solid Geology**<br>Description: Warwickshire Group | A13NW (W) | 0 | 2 | 386559 394399 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A13SW (W) | 0 | 2 | 386449 394355 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A13NE (NE) | 0 | 2 | 386623 394441 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A13NW (W) | 0 | 2 | 386559 394399 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A13NW (W) | 2 | 2 | 386425 394423 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A13SW (W) | 22 | 2 | 386418 394387 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A13NW (NW) | 173 | 2 | 386459 394621 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A13NE (NE) | 203 | 2 | 386868 394591 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A13NE (NE) | 204 | 2 | 386879 394574 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A8NW (S) | 299 | 2 | 386559 394000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A14NW (E) | 301 | 2 | 387000 394399 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A8NE (S) | 318 | 2 | 386624 394000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A8NW (SW) | 318 | 2 | 386347 394000 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A14SW (E) | 319 | 2 | 387000 394372 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A8NE (SE) | 410 | 2 | 386881 394000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A8NW (S) | 413 | 2 | 386559 393885 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A8NW (SW) | 431 | 2 | 386326 393887 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A12NE (W) | 431 | 2 | 386000 394399 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A18SE (N) | 432 | 2 | 386622 394904 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A8NE (S) | 441 | 2 | 386683 393883 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A9NW (SE) | 493 | 2 | 387000 394000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A18SE (N) | 522 | 2 | 386603 395000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A8NW (S) | 524 | 2 | 386527 393771 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A18SW (N) | 530 | 2 | 386559 395000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A14NW (E) | 533 | 2 | 387217 394609 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A8NW (SW) | 536 | 2 | 386302 393785 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A18SW (N) | 538 | 2 | 386541 395000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A18SW (N) | 540 | 2 | 386524 395000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A17SE (NW) | 542 | 2 | 386000 394772 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A18SE (NE) | 544 | 2 | 386854 395000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A7NE (SW) | 544 | 2 | 386000 394000 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A9NW (SE) | 545 | 2 | 386948 393881 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A19SW (NE) | 548 | 2 | 387169 394760 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: <15 mg/kg | A8NW (SW) | 553 | 2 | 386276 393775 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A8NE (S) | 574 | 2 | 386770 393765 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A9NW (SE) | 579 | 2 | 387000 393880 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A8NE (S) | 602 | 2 | 386787 393740 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A19SW (NE) | 602 | 2 | 387000 395000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A7NE (SW) | 612 | 2 | 386000 393890 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A9NW (SE) | 646 | 2 | 387000 393795 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A19SW (NE) | 662 | 2 | 387106 395000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A17SE (NW) | 663 | 2 | 386072 395000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A9NW (SE) | 673 | 2 | 387000 393762 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A9NW (SE) | 682 | 2 | 387227 394000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A9NW (SE) | 685 | 2 | 387020 393761 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: <15 mg/kg | A7NE (SW) | 692 | 2 | 386000 393778 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A9NW (SE) | 699 | 2 | 387000 393730 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A17SE (NW) | 704 | 2 | 386000 395000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A19SW (NE) | 750 | 2 | 387238 395000 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A17NE (NW) | 767 | 2 | 386000 395077 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A9NE (SE) | 810 | 2 | 387303 393877 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A19NW (NE) | 825 | 2 | 387000 395247 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A9NE (SE) | 851 | 2 | 387414 394000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 150 - 300 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A17SW (NW) | 853 | 2 | 385785 395000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A9NE (SE) | 941 | 2 | 387454 393876 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <150 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A19NE (NE) | 959 | 2 | 387303 395224 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 386290, 395220<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 13.00 mg/kg<br>Cadmium Measured Concentration: 1.80 mg/kg<br>Chromium Measured Concentration: 61.00 mg/kg<br>Lead Measured Concentration: 212.00 mg/kg<br>Nickel Measured Concentration: 19.00 mg/kg | A18NW (N) | 790 | 2 | 386290 395220 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 386680, 395300<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 32.00 mg/kg<br>Cadmium Measured Concentration: 1.40 mg/kg<br>Chromium Measured Concentration: 75.00 mg/kg<br>Lead Measured Concentration: 510.00 mg/kg<br>Nickel Measured Concentration: 37.00 mg/kg | A18NE (N) | 822 | 2 | 386680 395300 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 387260, 395260<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 33.00 mg/kg<br>Cadmium Measured Concentration: 0.80 mg/kg<br>Chromium Measured Concentration: 78.00 mg/kg<br>Lead Measured Concentration: 305.00 mg/kg<br>Nickel Measured Concentration: 41.00 mg/kg | A19NE (NE) | 962 | 2 | 387260 395260 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Urban Soil Chemistry Averages**<br>Source: British Geological Survey, National Geoscience Information Service<br>Sample Area: Manchester<br>Count Id: 300<br>Arsenic Minimum Concentration: 3.00 mg/kg<br>Arsenic Average Concentration: 28.00 mg/kg<br>Arsenic Maximum Concentration: 1008.00 mg/kg<br>Cadmium Minimum Concentration: 0.30 mg/kg<br>Cadmium Average Concentration: 1.40 mg/kg<br>Cadmium Maximum Concentration: 80.30 mg/kg<br>Chromium Minimum Concentration: 29.00 mg/kg<br>Chromium Average Concentration: 92.00 mg/kg<br>Chromium Maximum Concentration: 1252.00 mg/kg<br>Lead Minimum Concentration: 21.00 mg/kg<br>Lead Average Concentration: 270.00 mg/kg<br>Lead Maximum Concentration: 2687.00 mg/kg<br>Nickel Minimum Concentration: 6.00 mg/kg<br>Nickel Average Concentration: 32.00 mg/kg<br>Nickel Maximum Concentration: 137.00 mg/kg | A13NW (N) | 234 | 2 | 386559 394701 |
| | **Coal Mining Affected Areas**<br>In an area that might not be affected by coal mining | | | | |
| | **Non Coal Mining Areas of Great Britain**<br>Risk: Rare<br>Source: British Geological Survey, National Geoscience Information Service | A13NE (NE) | 0 | 2 | 386623 394441 |
| | **Potential for Collapsible Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 0 | 2 | 386559 394399 |
| | **Potential for Compressible Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 0 | 2 | 386559 394399 |
| | **Potential for Ground Dissolution Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 0 | 2 | 386559 394399 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 0 | 2 | 386559 394399 |
| | **Potential for Running Sand Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 0 | 2 | 386559 394399 |
| | **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 0 | 2 | 386559 394399 |
| | **Radon Potential - Radon Protection Measures**<br>Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 0 | 2 | 386559 394399 |
| | **Radon Potential - Radon Affected Areas**<br>Affected Area: The property is in a lower probability radon area, as less than 1% of homes are above the action level<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 0 | 2 | 386559 394399 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 29 | **Contemporary Trade Directory Entries**<br>Name: Alpha<br>Location: 20, Kingsway Avenue, Manchester, M19 2DH<br>Classification: Freight Forwarders<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A13SE (SE) | 146 | - | 386761 394269 |
| 30 | **Contemporary Trade Directory Entries**<br>Name: West Point Hardware<br>Location: 14, Kingsway, Manchester, M19 2DD<br>Classification: Hardware<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13SE (SE) | 193 | - | 386791 394222 |
| 31 | **Contemporary Trade Directory Entries**<br>Name: Thi Uk Ltd<br>Location: 9, Kingsway, Manchester, M19 2BZ<br>Classification: Car Washing & Polishing Equipment & Supplies<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13SE (SE) | 237 | - | 386794 394155 |
| 31 | **Contemporary Trade Directory Entries**<br>Name: M & B Systems Power Instrumentation Ltd<br>Location: 308-310, Slade Lane, Manchester, M19 2BY<br>Classification: Electronic Engineers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13SE (SE) | 270 | - | 386836 394153 |
| 31 | **Contemporary Trade Directory Entries**<br>Name: M & B Systems Power Instrumentation Ltd<br>Location: 308-310, Slade Lane, Manchester, M19 2BY<br>Classification: Electronic Engineers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13SE (SE) | 270 | - | 386836 394153 |
| 31 | **Contemporary Trade Directory Entries**<br>Name: Mellies Maids<br>Location: 326, Slade Lane, Manchester, Lancashire, M19 2BY<br>Classification: Cleaning Services - Domestic<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13SE (SE) | 308 | - | 386846 394106 |
| 32 | **Contemporary Trade Directory Entries**<br>Name: Jollyes Petfood Superstore<br>Location: Unit F, Fallowfield Shopping Centre, Birchfields Road, Manchester, M14 6FS<br>Classification: Pet Foods & Animal Feeds<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A8NW (S) | 292 | - | 386496 394009 |
| 33 | **Contemporary Trade Directory Entries**<br>Name: Logoprint<br>Location: 330, Slade Lane, Manchester, M19 2BY<br>Classification: Printers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13SE (SE) | 320 | - | 386850 394093 |
| 34 | **Contemporary Trade Directory Entries**<br>Name: Loony Print Ltd<br>Location: 320, Moseley Road, Levenshulme, Manchester, M19 2LH<br>Classification: Printers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A8NE (SE) | 355 | - | 386848 394044 |
| 34 | **Contemporary Trade Directory Entries**<br>Name: Rochelle Fabrics<br>Location: 215-217, Slade Lane, Manchester, M19 2EX<br>Classification: Textile Manufacturing<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A8NE (SE) | 398 | - | 386883 394018 |
| 35 | **Contemporary Trade Directory Entries**<br>Name: Carbuyertom.Com<br>Location: 227 Moseley Road, Manchester, Lancashire, M14 6pa<br>Classification: Car Dealers - Used<br>**Status: Active**<br>Positional Accuracy: Manually positioned to the road within the address or location | A8NW (S) | 377 | - | 386389 393927 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 35 | **Contemporary Trade Directory Entries**<br>Name: Auto Direct<br>Location: Belvedeer Rd,Unit 1a Moseley Rd, Fallowfield, Manchester, Lancashire, M14 6PD<br>Classification: Mot Testing Centres<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned within the geographical locality | A8NW (S) | 400 | - | 386397 393903 |
| 35 | **Contemporary Trade Directory Entries**<br>Name: Autopoint Accident Repair Centre<br>Location: 244a Belvedere Rd, Fallowfield, Manchester, Lancashire, M14 6PD<br>Classification: Car Body Repairs<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned within the geographical locality | A8NW (S) | 400 | - | 386397 393903 |
| 36 | **Contemporary Trade Directory Entries**<br>Name: Autopoint Accident Repair Centre Ltd<br>Location: 244-250, Moseley Road, Fallowfield, Manchester, M14 6PD<br>Classification: Car Body Repairs<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A8NW (S) | 404 | - | 386473 393895 |
| 36 | **Contemporary Trade Directory Entries**<br>Name: Auto Point<br>Location: 244-250, Moseley Road, Fallowfield, Manchester, M14 6PD<br>Classification: Garage Services<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A8NW (S) | 404 | - | 386473 393895 |
| 36 | **Contemporary Trade Directory Entries**<br>Name: Kwik Fit<br>Location: 244a, Moseley Road, Fallowfield, Manchester, M14 6PD<br>Classification: Tyre Dealers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A8NW (S) | 434 | - | 386472 393865 |
| 37 | **Contemporary Trade Directory Entries**<br>Name: D H Kemp<br>Location: 55, Kingsway, Manchester, M19 2LL<br>Classification: Vacuum Cleaners - Sales & Service<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A8NE (S) | 410 | - | 386574 393901 |
| 38 | **Contemporary Trade Directory Entries**<br>Name: Stephen Liptrott<br>Location: Ross Av, Manchester, M19 2HW<br>Classification: Control Panels<br>**Status: Active**<br>Positional Accuracy: Manually positioned to the road within the address or location | A14SW (SE) | 410 | - | 386948 394068 |
| 39 | **Contemporary Trade Directory Entries**<br>Name: Jacob & Co<br>Location: 358, Slade Lane, Manchester, M19 2BX<br>Classification: Car Dealers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A8NE (SE) | 415 | - | 386823 393955 |
| 40 | **Contemporary Trade Directory Entries**<br>Name: Sultan Supersotre<br>Location: 7, Meldon Road, Manchester, M13 0TZ<br>Classification: Meat - Wholesale<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A18SW (NW) | 424 | - | 386292 394844 |
| 41 | **Contemporary Trade Directory Entries**<br>Name: Total<br>Location: Moseley Rd, Fallowfield, Manchester, M14 6PD<br>Classification: Petrol Filling Stations<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A7NE (SW) | 435 | - | 386221 393932 |
| 41 | **Contemporary Trade Directory Entries**<br>Name: Kpn Accident Repair<br>Location: Moseley Rd, Fallowfield, Manchester, M14 6PD<br>Classification: Car Body Repairs<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A7NE (SW) | 454 | - | 386190 393930 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 42 | **Contemporary Trade Directory Entries**<br>Name: S & M Auto Repairs<br>Location: 91, Slade Lane, Manchester, M13 0GW<br>Classification: Garage Services<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A19SW (NE) | 485 | - | 387022 394841 |
| 42 | **Contemporary Trade Directory Entries**<br>Name: A1 Tyres<br>Location: 91, Slade Lane, Manchester, M13 0GW<br>Classification: Tyre Dealers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A19SW (NE) | 485 | - | 387022 394841 |
| 42 | **Contemporary Trade Directory Entries**<br>Name: Fast Autos<br>Location: 91, Slade Lane, Manchester, M13 0GW<br>Classification: Garage Services<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A19SW (NE) | 485 | - | 387022 394840 |
| 42 | **Contemporary Trade Directory Entries**<br>Name: Driveaway Motors Ltd<br>Location: 91, Slade Lane, Manchester, Lancashire, M13 0GW<br>Classification: Garage Services<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A19SW (NE) | 485 | - | 387022 394841 |
| 42 | **Contemporary Trade Directory Entries**<br>Name: A1 Tyres<br>Location: 91, Slade Lane, Manchester, Lancashire, M13 0GW<br>Classification: Tyre Dealers<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A19SW (NE) | 485 | - | 387022 394841 |
| 43 | **Contemporary Trade Directory Entries**<br>Name: T O'Neill<br>Location: 48, Albert Road, Manchester, M19 2AB<br>Classification: French Polishing<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14SW (SE) | 488 | - | 387090 394175 |
| 44 | **Contemporary Trade Directory Entries**<br>Name: Sk Pharma Ltd<br>Location: 7, Dean Bank Avenue, Manchester, M19 2EZ<br>Classification: Chemists' & Pharmacists' Suppliers & Wholesalers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A9NW (SE) | 506 | - | 386956 393938 |
| 45 | **Contemporary Trade Directory Entries**<br>Name: Transworld Telecoms Ltd<br>Location: 91, Beresford Road, Manchester, M13 0TA<br>Classification: Telecommunications Equipment & Systems<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A18SE (N) | 510 | - | 386671 394987 |
| 45 | **Contemporary Trade Directory Entries**<br>Name: Al-Najaf Halal Meat<br>Location: 87, Beresford Road, Manchester, M13 0TA<br>Classification: Meat - Wholesale<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A18SE (N) | 516 | - | 386659 394993 |
| 46 | **Contemporary Trade Directory Entries**<br>Name: Quick & Spick<br>Location: 36, Albert Road, Manchester, M19 2AB<br>Classification: Laundries & Launderettes<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14SW (E) | 532 | - | 387140 394177 |
| 47 | **Contemporary Trade Directory Entries**<br>Name: Super Tyres<br>Location: 1, The Crescent, Manchester, M19 3AJ<br>Classification: Tyre Dealers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14NE (E) | 576 | - | 387275 394466 |
| 48 | **Contemporary Trade Directory Entries**<br>Name: Rodney House Assessment Centre<br>Location: Rodney House, 388, Slade Lane, Manchester, M19 2HT<br>Classification: Hospitals<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A8NE (S) | 594 | - | 386709 393733 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 49 | **Contemporary Trade Directory Entries**<br>Name: B C S<br>Location: 91, Slade Lane, Manchester, M13 0GW<br>Classification: Car Breakers & Dismantlers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned in the proximity of the address | A19SW (NE) | 602 | - | 387037 394976 |
| 49 | **Contemporary Trade Directory Entries**<br>Name: Zeta (Fuels) Ltd<br>Location: 91, Slade Lane, Manchester, M13 0GW<br>Classification: Petrol Filling Stations - 24 Hour<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A19SW (NE) | 602 | - | 387037 394976 |
| 50 | **Contemporary Trade Directory Entries**<br>Name: Lda Transmission Engineering Ltd<br>Location: 12-16, Park Grove, Manchester, M19 3AQ<br>Classification: Power Transmission Equipment<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14NE (E) | 609 | - | 387276 394673 |
| 50 | **Contemporary Trade Directory Entries**<br>Name: Power Star<br>Location: 818, Stockport Road, Manchester, Lancashire, M19 3AW<br>Classification: Sports Equipment Manufacturers & Distributors<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A14NE (E) | 654 | - | 387323 394678 |
| 51 | **Contemporary Trade Directory Entries**<br>Name: Star<br>Location: 88, Birch Hall Lane, Manchester, M13 0XZ<br>Classification: Mot Testing Centres<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A18SW (NW) | 610 | - | 386271 395032 |
| 52 | **Contemporary Trade Directory Entries**<br>Name: Cotswold Confectionery Ltd<br>Location: 21-23, Albert Road, Manchester, M19 2EQ<br>Classification: Confectionery Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14SW (SE) | 619 | - | 387213 394127 |
| 53 | **Contemporary Trade Directory Entries**<br>Name: Drilline Products<br>Location: 5, Brailsford Road, Manchester, M14 6PT<br>Classification: Drilling & Boring Equipment & Supplies<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7NE (SW) | 620 | - | 386025 393852 |
| 54 | **Contemporary Trade Directory Entries**<br>Name: Mpa (Uk) Ltd<br>Location: A, 2, Buckhurst Road, Manchester, M19 2DS<br>Classification: Copying & Duplicating Services<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14SE (E) | 626 | - | 387248 394177 |
| 54 | **Contemporary Trade Directory Entries**<br>Name: G Pennant Roberts Ltd<br>Location: 12, Albert Road, Manchester, M19 3PJ<br>Classification: Chemists' & Pharmacists' Suppliers & Wholesalers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A14SE (E) | 636 | - | 387262 394184 |
| 55 | **Contemporary Trade Directory Entries**<br>Name: Kreativ3 Entertainment<br>Location: Flat 9, Rylands House, Opal Court, Moseley Road, Fallowfield, Manchester, M14 6ZU<br>Classification: Sound Equipment Systems Manufacturers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A7NE (SW) | 644 | - | 385976 393869 |
| 56 | **Contemporary Trade Directory Entries**<br>Name: H & K Distributors<br>Location: 2, Swallow Street, Manchester, M12 4GH<br>Classification: Electrical Goods Sales, Manufacturers & Wholesalers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A19SE (NE) | 646 | - | 387254 394810 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 56 | **Contemporary Trade Directory Entries**<br>Name: Swallow Hosiery<br>Location: 2, Swallow Street, Manchester, M12 4GH<br>Classification: Lingerie & Hosiery Manufacturers & Wholesalers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A19SE (NE) | 646 | - | 387254 394810 |
| 56 | **Contemporary Trade Directory Entries**<br>Name: Manchester Garages & Buildings<br>Location: 770, Stockport Road, Manchester, M12 4GD<br>Classification: Garage Services<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A19SE (NE) | 670 | - | 387262 394842 |
| 57 | **Contemporary Trade Directory Entries**<br>Name: Everest D I Y Timber & Building Yard<br>Location: 854-856, Stockport Road, Manchester, M19 3AH<br>Classification: Builders' Merchants<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A14NE (E) | 657 | - | 387356 394463 |
| 57 | **Contemporary Trade Directory Entries**<br>Name: Rivertone Technology<br>Location: 858-866 Stockport Rd, Manchester, M19 3AH<br>Classification: Electronic Component Manufacturers & Distributors<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A14NE (E) | 667 | - | 387365 394433 |
| 57 | **Contemporary Trade Directory Entries**<br>Name: Manchester Appliances<br>Location: 858, Stockport Road, Manchester, M19 3AH<br>Classification: Electrical Goods Sales, Manufacturers & Wholesalers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A14NE (E) | 668 | - | 387366 394434 |
| 58 | **Contemporary Trade Directory Entries**<br>Name: Seasia Consultants Ltd<br>Location: 7, Acorn Close, Manchester, M19 2HS<br>Classification: Electrical Engineers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A8SE (S) | 660 | - | 386676 393662 |
| 59 | **Contemporary Trade Directory Entries**<br>Name: Universal Halal Food Products<br>Location: 45a, Slade Lane, Manchester, M13 0QJ<br>Classification: Roller Shutter Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A19SW (NE) | 662 | - | 387052 395038 |
| 59 | **Contemporary Trade Directory Entries**<br>Name: Manchester Metal Spinning Co Ltd<br>Location: 35, Slade Lane, Manchester, Lancashire, M13 0QJ<br>Classification: Metal Products - Fabricated<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A19NW (NE) | 691 | - | 387047 395075 |
| 60 | **Contemporary Trade Directory Entries**<br>Name: Choudhary Trading Co Ltd<br>Location: 1, Carrill Grove, Manchester, M19 3AE<br>Classification: Electronic Component Manufacturers & Distributors<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14SE (E) | 665 | - | 387337 394291 |
| 60 | **Contemporary Trade Directory Entries**<br>Name: Euro Fuels<br>Location: 888, Stockport Road, Manchester, M19 3BN<br>Classification: Oil Fuel Distributors<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A14SE (E) | 675 | - | 387356 394324 |
| 60 | **Contemporary Trade Directory Entries**<br>Name: Photo Express Ltd<br>Location: 900, Stockport Road, Manchester, M19 3AD<br>Classification: Photographic Processors<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14SE (E) | 683 | - | 387355 394288 |
| 61 | **Contemporary Trade Directory Entries**<br>Name: Ovenclean Manchester<br>Location: 63, Clitheroe Road, Manchester, M13 0QU<br>Classification: Oven cleaning<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A18NE (N) | 672 | - | 386736 395150 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 62 | **Contemporary Trade Directory Entries**<br>Name: Sharif & Sons<br>Location: 56-61, Beresford Road, Manchester, M13 0GT<br>Classification: Meat - Wholesale<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A18NE (N) | 673 | - | 386612 395146 |
| 62 | **Contemporary Trade Directory Entries**<br>Name: Tara Clinic<br>Location: 59d Beresford Rd, Manchester, Lancashire, M13 0GT<br>Classification: Electrolysis<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned within the geographical locality | A18NE (N) | 687 | - | 386608 395159 |
| 63 | **Contemporary Trade Directory Entries**<br>Name: Brag Cleaning Services<br>Location: 48, Danes Road, Manchester, M14 5JS<br>Classification: Carpet, Curtain & Upholstery Cleaners<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12NW (NW) | 676 | - | 385811 394713 |
| 64 | **Contemporary Trade Directory Entries**<br>Name: Khans Motors<br>Location: 806-810 Stockport Rd, Manchester, Lancashire, M19 3BS<br>Classification: Car Dealers - Used<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A19SE (NE) | 682 | - | 387315 394772 |
| 64 | **Contemporary Trade Directory Entries**<br>Name: Tyreworx Tyres<br>Location: 691, Stockport Road, Manchester, M12 4QN<br>Classification: Tyre Dealers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A19SE (NE) | 718 | - | 387337 394808 |
| 64 | **Contemporary Trade Directory Entries**<br>Name: Crowcroft Service Station<br>Location: 691, Stockport Road, Manchester, M12 4QN<br>Classification: Petrol Filling Stations - 24 Hour<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A19SE (NE) | 718 | - | 387337 394808 |
| 65 | **Contemporary Trade Directory Entries**<br>Name: The Vac Centre<br>Location: 731, Stockport Road, Manchester, M19 3AR<br>Classification: Vacuum Cleaners - Sales & Service<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14NE (E) | 689 | - | 387372 394627 |
| 66 | **Contemporary Trade Directory Entries**<br>Name: Crowcroft<br>Location: 3, Crowcroft Road, Manchester, M12 4QZ<br>Classification: Wrought Ironwork<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A19SW (NE) | 698 | - | 387131 395027 |
| 67 | **Contemporary Trade Directory Entries**<br>Name: A Dip A Door<br>Location: 3, Albert Road, Manchester, M19 3PJ<br>Classification: Paint & Varnish Stripping<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A14SE (E) | 710 | - | 387328 394148 |
| 68 | **Contemporary Trade Directory Entries**<br>Name: My Own Electricity Ltd<br>Location: 793, Stockport Road, Manchester, M19 3DL<br>Classification: Energy Efficient Products and Services<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14NE (E) | 711 | - | 387407 394405 |
| 69 | **Contemporary Trade Directory Entries**<br>Name: P T S Handling<br>Location: 55, Linden Park, Manchester, M19 2PG<br>Classification: Fork Lift Trucks<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A9SW (SE) | 723 | - | 387003 393704 |
| 70 | **Contemporary Trade Directory Entries**<br>Name: Trust Computers<br>Location: 944, Stockport Road, Manchester, M19 3NN<br>Classification: Electrical goods - servicing & repairs<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14SE (E) | 731 | - | 387351 394149 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 70 | **Contemporary Trade Directory Entries**<br>Name: Wallstyle<br>Location: 958-960, Stockport Road, Manchester, M19 3NN<br>Classification: Wallpapers & Wall Coverings<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14SE (E) | 752 | - | 387350 394101 |
| 70 | **Contemporary Trade Directory Entries**<br>Name: Khaled Printers<br>Location: 970, Stockport Road, Manchester, M19 3NN<br>Classification: Printers<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned within the geographical locality | A14SE (E) | 752 | - | 387350 394101 |
| 71 | **Contemporary Trade Directory Entries**<br>Name: Orthopaedic & Pocket Sprung Bed Co<br>Location: 4 Carrill Grove East, Manchester, M19 3BT<br>Classification: Bed & Mattress Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A14SE (E) | 750 | - | 387426 394296 |
| 71 | **Contemporary Trade Directory Entries**<br>Name: Wrought Iron Specialist<br>Location: Carrill Gr East, Manchester, Lancashire, M19 3BT<br>Classification: Wrought Ironwork<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A14SE (E) | 771 | - | 387451 394308 |
| 72 | **Contemporary Trade Directory Entries**<br>Name: Levenshulme Auto Repair Centre<br>Location: 3, Chapel Street, Levenshulme, Manchester, M19 3QB<br>Classification: Mot Testing Centres<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14SE (E) | 756 | - | 387414 394231 |
| 73 | **Contemporary Trade Directory Entries**<br>Name: S & R Auto Repair Centre<br>Location: 3, Matthews Lane, Manchester, M12 4QW<br>Classification: Garage Services<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14NE (E) | 770 | - | 387428 394726 |
| 73 | **Contemporary Trade Directory Entries**<br>Name: S & R Auto Repair Centre<br>Location: 3, Matthews Lane, Manchester, M12 4QW<br>Classification: Mot Testing Centres<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A14NE (E) | 770 | - | 387428 394726 |
| 74 | **Contemporary Trade Directory Entries**<br>Name: Bruntwood Wrought Iron<br>Location: 2 Bankley St, Manchester, Lancashire, M19 3PP<br>Classification: Gate Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A14SE (E) | 771 | - | 387400 394157 |
| 74 | **Contemporary Trade Directory Entries**<br>Name: Omnifore Ltd<br>Location: Bankley House, Bankley Street, Manchester, M19 3PP<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned in the proximity of the address | A14SE (E) | 775 | - | 387407 394163 |
| 74 | **Contemporary Trade Directory Entries**<br>Name: Twentieth Century<br>Location: Bankley House, Bankley Street, Manchester, M19 3PP<br>Classification: Fireplaces & Mantelpieces<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned in the proximity of the address | A14SE (E) | 775 | - | 387407 394163 |
| 74 | **Contemporary Trade Directory Entries**<br>Name: Parker Body Builders Ltd<br>Location: Chapel Street, Levenshulme, Manchester, M19 3QA<br>Classification: Car Body Repairs<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A14SE (E) | 784 | - | 387419 394168 |
| 74 | **Contemporary Trade Directory Entries**<br>Name: Willfab Engineering<br>Location: Chapel Street, Levenshulme, Manchester, M19 3QA<br>Classification: Wrought Ironwork<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14SE (E) | 784 | - | 387419 394168 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 74 | **Contemporary Trade Directory Entries**<br>Name: Ali Gate & Fencing<br>Location: Bankley House, Bankley Street, MANCHESTER, M19 3PP<br>Classification: Wrought Ironwork<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A14SE (E) | 789 | - | 387417 394150 |
| 75 | **Contemporary Trade Directory Entries**<br>Name: J M Devine Ltd<br>Location: 17, Slade Lane, Manchester, M13 0QJ<br>Classification: Road Haulage Services<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A19NW (NE) | 778 | - | 387027 395184 |
| 76 | **Contemporary Trade Directory Entries**<br>Name: Air Aisa Express Travels & Cargo Ltd<br>Location: 4, Duncan Road, Manchester, M13 0GF<br>Classification: Cargo Handling Services<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A19NW (NE) | 787 | - | 386974 395216 |
| 76 | **Contemporary Trade Directory Entries**<br>Name: Air Asia Express Travels & Cargo<br>Location: 4, Duncan Road, Manchester, M13 0GF<br>Classification: Transport Equipment - Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A19NW (NE) | 787 | - | 386974 395216 |
| 77 | **Contemporary Trade Directory Entries**<br>Name: Popular Trading<br>Location: 2, Hawkhurst Road, Manchester, M13 0ST<br>Classification: Scrap Metal Merchants<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A18NE (N) | 787 | - | 386694 395266 |
| 78 | **Contemporary Trade Directory Entries**<br>Name: Dress My Windows<br>Location: 8, Kempton Road, Manchester, M19 2GJ<br>Classification: Blinds, Awnings & Canopies<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A9SW (SE) | 791 | - | 387002 393625 |
| 79 | **Contemporary Trade Directory Entries**<br>Name: The Car Centre Ltd<br>Location: Moseley Road, Fallowfield, Manchester, M14 6PA<br>Classification: Car Dealers<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A7NW (SW) | 795 | - | 385732 393968 |
| 80 | **Contemporary Trade Directory Entries**<br>Name: Corshire Ltd<br>Location: Unit 5, Longden Road, Manchester, M12 5SJ<br>Classification: Paper & Cardboard Products & Packaging - Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned in the proximity of the address | A19SE (NE) | 798 | - | 387407 394846 |
| 80 | **Contemporary Trade Directory Entries**<br>Name: Corshire Ltd<br>Location: Unit 5, Longden Road, Manchester, M12 5SJ<br>Classification: Paper & Cardboard Products & Packaging - Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned in the proximity of the address | A19SE (NE) | 798 | - | 387407 394846 |
| 80 | **Contemporary Trade Directory Entries**<br>Name: United Tyres & Autos<br>Location: Longden Rd, Manchester, Lancashire, M12 5SJ<br>Classification: Garage Services<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned within the geographical locality | A19SE (NE) | 801 | - | 387416 394835 |
| 81 | **Contemporary Trade Directory Entries**<br>Name: Diamond Windows Ltd<br>Location: 4, Barlow Road, Levenshulme, Manchester, M19 3DJ<br>Classification: Window Frame Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14NE (E) | 799 | - | 387493 394390 |
| 81 | **Contemporary Trade Directory Entries**<br>Name: Bluestone Print<br>Location: 4, Barlow Road, Levenshulme, Manchester, M19 3DJ<br>Classification: Printers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14NE (E) | 799 | - | 387493 394390 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 82 | **Contemporary Trade Directory Entries**<br>Name: Sheena Knitwear Manchester Ltd<br>Location: 46, Hamilton Road, Manchester, M13 0PE<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A18NE (N) | 799 | - | 386755 395275 |
| 83 | **Contemporary Trade Directory Entries**<br>Name: Belper Tools<br>Location: 7, Chapel Street, Levenshulme, Manchester, M19 3QB<br>Classification: Machine Shops<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A14SE (E) | 812 | - | 387471 394225 |
| 84 | **Contemporary Trade Directory Entries**<br>Name: Regal<br>Location: 986, Stockport Road, Manchester, M19 3NN<br>Classification: Dry Cleaners<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A9NE (SE) | 832 | - | 387398 394014 |
| 84 | **Contemporary Trade Directory Entries**<br>Name: Mix Lot<br>Location: 901, Stockport Road, Manchester, M19 3PG<br>Classification: Electrical Goods Sales, Manufacturers & Wholesalers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A9NE (E) | 852 | - | 387433 394046 |
| 85 | **Contemporary Trade Directory Entries**<br>Name: Barry Dean Blacksmiths<br>Location: 43a, Cromwell Grove, Manchester, M19 3QD<br>Classification: Blacksmiths & Forgemasters<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A14SE (E) | 844 | - | 387518 394277 |
| 86 | **Contemporary Trade Directory Entries**<br>Name: Cafron Technical Services<br>Location: 5, Hannah Street, Manchester, M12 5SN<br>Classification: Mechanical Engineers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A19SE (NE) | 846 | - | 387422 394919 |
| 87 | **Contemporary Trade Directory Entries**<br>Name: Umars<br>Location: 653, Stockport Road, Manchester, Lancashire, M12 4QA<br>Classification: Electrical Engineers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A19NW (NE) | 847 | - | 387119 395214 |
| 87 | **Contemporary Trade Directory Entries**<br>Name: Albion Restoration<br>Location: 643, Stockport Road, Manchester, M12 4QA<br>Classification: Antiques - Repairing & Restoring<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A19NW (NE) | 861 | - | 387110 395236 |
| 88 | **Contemporary Trade Directory Entries**<br>Name: T O'Neill<br>Location: 45, Burnage Hall Road, Manchester, M19 2JP<br>Classification: French Polishing<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A8SE (S) | 849 | - | 386637 393467 |
| 89 | **Contemporary Trade Directory Entries**<br>Name: Silver Crest Manchester Ltd<br>Location: Unit 2, 20a, Stamford Road, Manchester, M13 0SN<br>Classification: Clothing & Fabrics - Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A18NE (N) | 870 | - | 386683 395348 |
| 90 | **Contemporary Trade Directory Entries**<br>Name: Ernest Bentley & Sons Ltd<br>Location: Harburg House, 11, Ladybarn Road, Manchester, M14 6WN<br>Classification: Builders' Merchants<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A7NW (SW) | 871 | - | 385693 393877 |
| 91 | **Contemporary Trade Directory Entries**<br>Name: Big Foot Independant Hospital<br>Location: Bigfoot, Birch Hall Lane, Manchester, M13 0XE<br>Classification: Hospitals<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A18NW (N) | 877 | - | 386377 395320 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 92 | **Contemporary Trade Directory Entries**<br>Name: Martas Idea<br>Location: 14, Carill Drive, Manchester, M14 6WR<br>Classification: Blinds, Awnings & Canopies<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A7NW (SW) | 885 | - | 385652 393927 |
| 93 | **Contemporary Trade Directory Entries**<br>Name: Xcelent Wear<br>Location: 623, Stockport Road, Manchester, M12 4QA<br>Classification: Bags, Belts & Accessories - Manufacturers & Suppliers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A19NW (NE) | 889 | - | 387073 395285 |
| 94 | **Contemporary Trade Directory Entries**<br>Name: Stone Washer<br>Location: Flat 1, Winterley Court, 19-21, Errwood Road, Manchester, Lancashire, M19 2PN<br>Classification: Blast Cleaning<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A9NE (SE) | 895 | - | 387283 393714 |
| 95 | **Contemporary Trade Directory Entries**<br>Name: A T Equipment Sales<br>Location: 42, Burnage Lane, Manchester, M19 2NL<br>Classification: Commercial Vehicle Dealers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A8SE (S) | 898 | - | 386782 393436 |
| 96 | **Contemporary Trade Directory Entries**<br>Name: Marshalls Garage<br>Location: 65-67, Ladybarn Lane, Manchester, M14 6YL<br>Classification: Garage Services<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A7SE (SW) | 905 | - | 385916 393572 |
| 96 | **Contemporary Trade Directory Entries**<br>Name: Home & Dry<br>Location: 73, Ladybarn Lane, Manchester, M14 6YL<br>Classification: Laundries & Launderettes<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7SE (SW) | 930 | - | 385916 393541 |
| 96 | **Contemporary Trade Directory Entries**<br>Name: Hall'S Domestic Appliance<br>Location: 77, Ladybarn Lane, Manchester, M14 6YL<br>Classification: Vacuum Cleaners - Sales & Service<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7SE (SW) | 940 | - | 385919 393527 |
| 97 | **Contemporary Trade Directory Entries**<br>Name: R T Wall Care<br>Location: 16, Ranford Road, Manchester, M19 2GL<br>Classification: Damp & Dry Rot Control<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A9SW (SE) | 907 | - | 387137 393572 |
| 97 | **Contemporary Trade Directory Entries**<br>Name: Dave Bradley Renovations<br>Location: 16, Ranford Road, Manchester, M19 2GL<br>Classification: Damp & Dry Rot Control<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A9SW (SE) | 907 | - | 387137 393572 |
| 98 | **Contemporary Trade Directory Entries**<br>Name: M E B Cleaning & Maintenance Services<br>Location: 1002, Stockport Road, Manchester, M19 3WN<br>Classification: Commercial Cleaning Services<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A9NE (SE) | 913 | - | 387456 393944 |
| 99 | **Contemporary Trade Directory Entries**<br>Name: Delamere Car Centre<br>Location: 1a, Delamere Road, Manchester, M19 3NG<br>Classification: Garage Services<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A9NE (SE) | 916 | - | 387487 394010 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 100 | **Contemporary Trade Directory Entries**<br>Name: Afendi Ingredients<br>Location: 18-22, Chapel Street, Levenshulme, Manchester, Lancashire, M19 3QA<br>Classification: Food Products - Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14SE (E) | 916 | - | 387542 394121 |
| 100 | **Contemporary Trade Directory Entries**<br>Name: Easy Equip Euro<br>Location: 18-22, Chapel Street, Levenshulme, Manchester, M19 3QA<br>Classification: Catering Equipment<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14SE (E) | 916 | - | 387542 394121 |
| 100 | **Contemporary Trade Directory Entries**<br>Name: Gabby Autos<br>Location: 6, Stanhope Street, Manchester, M19 3WQ<br>Classification: Car Customisation & Conversion Specialists<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A14SE (E) | 948 | - | 387564 394091 |
| 101 | **Contemporary Trade Directory Entries**<br>Name: Appliance Repairs & Spares<br>Location: 183, Dickenson Road, Manchester, Lancashire, M13 0YN<br>Classification: Domestic Appliances - Servicing, Repairs & Parts<br>**Status: Active**<br>Positional Accuracy: Manually positioned to the address or location | A17NE (NW) | 917 | - | 386112 395302 |
| 101 | **Contemporary Trade Directory Entries**<br>Name: Gorton Bros Ltd<br>Location: 72-76, Laindon Road, Manchester, M14 5DG<br>Classification: Commercial Cleaning Services<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A17NE (NW) | 940 | - | 386124 395331 |
| 102 | **Contemporary Trade Directory Entries**<br>Name: The Wash Tub<br>Location: 46, Barlow Road, Levenshulme, Manchester, M19 3DA<br>Classification: Laundries & Launderettes<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A15NW (E) | 918 | - | 387617 394459 |
| 103 | **Contemporary Trade Directory Entries**<br>Name: Neelam Jewellers Ltd<br>Location: 636, Stockport Road, Manchester, M13 0SH<br>Classification: Jewellery Manufacturers & Repairers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A19NW (N) | 920 | - | 386917 395372 |
| 103 | **Contemporary Trade Directory Entries**<br>Name: Stamford Car Sales<br>Location: 1a, Stamford Road, Manchester, M13 0SE<br>Classification: Car Dealers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A18NE (N) | 932 | - | 386884 395392 |
| 104 | **Contemporary Trade Directory Entries**<br>Name: Mr Bubbles<br>Location: 246, Wilmslow Road, Manchester, M14 6LD<br>Classification: Laundries & Launderettes<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12SW (W) | 920 | - | 385556 394102 |
| 105 | **Contemporary Trade Directory Entries**<br>Name: Pro Cleaners Burnage<br>Location: 6, Cuthbert Avenue, Manchester, M19 3DG<br>Classification: Cleaning Services - Domestic<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A15NW (E) | 923 | - | 387590 394720 |
| 106 | **Contemporary Trade Directory Entries**<br>Name: Roniloid Co Ltd<br>Location: 145a, Dickenson Road, Manchester, M14 5HZ<br>Classification: Refrigerators & Freezers - Servicing & Repairs<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A17NE (NW) | 928 | - | 385976 395252 |
| 106 | **Contemporary Trade Directory Entries**<br>Name: Zain Cargo & Travel<br>Location: 145, Dickenson Road, Manchester, Lancashire, M14 5HZ<br>Classification: Freight Forwarders<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A17NE (NW) | 932 | - | 385958 395246 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 107 | **Contemporary Trade Directory Entries**<br>Name: Pro Cleaners Levenshulme<br>Location: 338a, Dickenson Road, Manchester, M13 0NG<br>Classification: Cleaning Services - Domestic<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 949 | - | 386601 395422 |
| 107 | **Contemporary Trade Directory Entries**<br>Name: Tumble Cleaners<br>Location: 338, Dickenson Road, Manchester, M13 0NG<br>Classification: Dry Cleaners<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 949 | - | 386601 395422 |
| 107 | **Contemporary Trade Directory Entries**<br>Name: Mucky Maureens Wash House<br>Location: 338a, Dickenson Road, Manchester, Lancashire, M13 0NG<br>Classification: Laundries & Launderettes<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 949 | - | 386601 395422 |
| 107 | **Contemporary Trade Directory Entries**<br>Name: Mucky Maureens Wash House<br>Location: 338a, Dickenson Road, Manchester, M13 0NG<br>Classification: Laundries & Launderettes<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 949 | - | 386601 395422 |
| 108 | **Contemporary Trade Directory Entries**<br>Name: Hamley<br>Location: Flat 24, Appleby Lodge, Wilmslow Road, Manchester, M14 6HQ<br>Classification: Car Dealers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A11NE (W) | 949 | - | 385512 394679 |
| 108 | **Contemporary Trade Directory Entries**<br>Name: Z A Majid & Co<br>Location: Flat 1, Appleby Lodge, Wilmslow Road, Manchester, M14 6HZ<br>Classification: Machinery - Industrial & Commercial<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A11NE (W) | 969 | - | 385503 394723 |
| 109 | **Contemporary Trade Directory Entries**<br>Name: Cargo Forwarding International Plc<br>Location: Unit 38 Imex Business Park,Hamilton Rd, Manchester, M13 0PD<br>Classification: Freight Forwarders<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A23SE (N) | 951 | - | 386735 395429 |
| 109 | **Contemporary Trade Directory Entries**<br>Name: Fashion Paradise<br>Location: Unit 24, Imex Business Park, Hamilton Road, Manchester, M13 0PD<br>Classification: Leather Garments & Products<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 952 | - | 386735 395430 |
| 109 | **Contemporary Trade Directory Entries**<br>Name: Carpets Choice<br>Location: Unit 27, Imex Business Park, Hamilton Road, Manchester, M13 0PD<br>Classification: Carpets & Rugs - Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 952 | - | 386735 395430 |
| 109 | **Contemporary Trade Directory Entries**<br>Name: Concept Carpets & Flooring<br>Location: Unit 55, Longsight Business Park, Hamilton Road, MANCHESTER, M13 0PD<br>Classification: Floorcoverings - Manufacturers & Wholesalers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 952 | - | 386735 395430 |
| 109 | **Contemporary Trade Directory Entries**<br>Name: Peripheral Components<br>Location: Unit 19-20 Imex Business Park,Hamilton Road, Manchester, Greater Manchester, M13 0PD<br>Classification: Electrical Goods Sales, Manufacturers & Wholesalers<br>**Status: Active**<br>Positional Accuracy: Manually positioned within the geographical locality | A23SE (N) | 952 | - | 386735 395430 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 109 | **Contemporary Trade Directory Entries**<br>Name: Aria Technology Ltd<br>Location: Imex Business Park, Hamilton Road, Manchester, M13 0PD<br>Classification: Computer Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 952 | - | 386735 395430 |
| 109 | **Contemporary Trade Directory Entries**<br>Name: S B T Engineering Services Ltd<br>Location: Imex Business Park, Hamilton Road, Manchester, M13 0PD<br>Classification: Gearboxes<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 952 | - | 386735 395430 |
| 109 | **Contemporary Trade Directory Entries**<br>Name: Ambar Textiles Ltd<br>Location: Unit 9, Imex Business Park, Hamilton Road, Manchester, M13 0PD<br>Classification: Lace Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 952 | - | 386735 395430 |
| 109 | **Contemporary Trade Directory Entries**<br>Name: Aria Technology Ltd<br>Location: Studio, 1-5, Imex Business Park, Hamilton Road, Manchester, M13 0PD<br>Classification: Electronic Component Manufacturers & Distributors<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 952 | - | 386735 395430 |
| 109 | **Contemporary Trade Directory Entries**<br>Name: Fires R Us Ltd<br>Location: Studio, 7-8, Imex Business Park, Hamilton Road, Manchester, Lancashire, M13 0PD<br>Classification: Fireplaces & Mantelpieces<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 952 | - | 386735 395430 |
| 109 | **Contemporary Trade Directory Entries**<br>Name: Fires R Us<br>Location: Studio, 1-5, Imex Business Park, Hamilton Road, MANCHESTER, M13 0PD<br>Classification: Fireplaces & Mantelpieces<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 952 | - | 386735 395430 |
| 109 | **Contemporary Trade Directory Entries**<br>Name: Moto Madness<br>Location: Unit 6, Imex Business Park, Hamilton Road, Manchester, Lancashire, M13 0PD<br>Classification: Motor Cycle Repairs<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 952 | - | 386735 395430 |
| 109 | **Contemporary Trade Directory Entries**<br>Name: Fires R Us Ltd<br>Location: Unit 51-53, Imex Business Park, Hamilton Road, Manchester, M13 0PD<br>Classification: Fireplaces & Mantelpieces<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 952 | - | 386735 395430 |
| 109 | **Contemporary Trade Directory Entries**<br>Name: Fires R Us<br>Location: Unit 51-53, Imex Business Park, Hamilton Road, Manchester, M13 0PD<br>Classification: Fireplaces & Mantelpieces<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 952 | - | 386735 395430 |
| 109 | **Contemporary Trade Directory Entries**<br>Name: Eco Plastics<br>Location: Unit 29, Imex Business Park, Hamilton Road, Manchester, Lancashire, M13 0PD<br>Classification: Cladding Suppliers & Installers<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A23SE (N) | 952 | - | 386735 395430 |
| 109 | **Contemporary Trade Directory Entries**<br>Name: Moto Madness<br>Location: Unit 6, Imex Business Park, Hamilton Road, Manchester, M13 0PD<br>Classification: Motor Cycle Repairs<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 952 | - | 386735 395430 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 109 | **Contemporary Trade Directory Entries**<br>Name: Brighthouse<br>Location: 376-378, Dickenson Road, MANCHESTER, M13 0WQ<br>Classification: Electrical Goods Sales, Manufacturers & Wholesalers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 995 | - | 386729 395473 |
| 110 | **Contemporary Trade Directory Entries**<br>Name: Wisdom Fireplaces<br>Location: 1014, Stockport Road, Manchester, Lancashire, M19 3WN<br>Classification: Fireplaces & Mantelpieces<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A9NE (SE) | 964 | - | 387488 393892 |
| 110 | **Contemporary Trade Directory Entries**<br>Name: W Bros & Cargo Services<br>Location: 949, Stockport Road, MANCHESTER, M19 3NP<br>Classification: Garage Services<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A9NE (SE) | 972 | - | 387510 393920 |
| 110 | **Contemporary Trade Directory Entries**<br>Name: W Bros<br>Location: 949, Stockport Road, MANCHESTER, M19 3NP<br>Classification: Cargo Handling Services<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A9NE (SE) | 972 | - | 387510 393920 |
| 110 | **Contemporary Trade Directory Entries**<br>Name: S A Cooling<br>Location: 1020, Stockport Road, Manchester, M19 3WN<br>Classification: Domestic Appliances - Servicing, Repairs & Parts<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A9NE (SE) | 978 | - | 387495 393875 |
| 110 | **Contemporary Trade Directory Entries**<br>Name: 1st4fireplaces.Co.Uk<br>Location: 1024, Stockport Road, Manchester, M19 3WX<br>Classification: Fireplaces & Mantelpieces<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A9NE (SE) | 996 | - | 387508 393860 |
| 110 | **Contemporary Trade Directory Entries**<br>Name: Kyran Hall<br>Location: 1024, Stockport Road, Manchester, M19 3WX<br>Classification: Stained Glass Designers & Producers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A9NE (SE) | 996 | - | 387508 393860 |
| 111 | **Contemporary Trade Directory Entries**<br>Name: Ck Motor Engineers Ltd<br>Location: 4-8, Stamford Road, Manchester, M13 0SF<br>Classification: Garage Services<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 969 | - | 386853 395435 |
| 111 | **Contemporary Trade Directory Entries**<br>Name: Arosa Manufacturing<br>Location: 17, Rainforth Street, Manchester, M13 0RP<br>Classification: Clothing & Fabrics - Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 985 | - | 386816 395457 |
| 112 | **Contemporary Trade Directory Entries**<br>Name: S & M Cargo Services<br>Location: 315, Dickenson Road, Manchester, M13 0NR<br>Classification: Freight Forwarders<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A23SW (N) | 984 | - | 386530 395449 |
| 113 | **Fuel Station Entries**<br>Name: Birchfields Service Station<br>Location: 227 Moseley Road, Fallowfield, Manchester, Lancashire, M14 6PA<br>Brand: Unbranded<br>Premises Type: Not Applicable<br>**Status: Obsolete**<br>Positional Accuracy: Manually positioned to the address or location | A8NW (S) | 352 | - | 386441 393947 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 114 | **Fuel Station Entries**<br>Name: S & S Service Station<br>Location: 91 Slade Lane, Levenshulme, Manchester, M13 0GW<br>Brand: Q8<br>Premises Type: Not Applicable<br>**Status: Obsolete**<br>Positional Accuracy: Automatically positioned to the address | A19SW (NE) | 602 | - | 387037 394976 |
| 115 | **Fuel Station Entries**<br>Name: Malthurst Crowcroft<br>Location: 691 Stockport Road, Longsight, Manchester, M12 4QN<br>Brand: Texaco<br>Premises Type: Not Applicable<br>**Status: Obsolete**<br>Positional Accuracy: Located by supplier to within 10m | A19SE (NE) | 716 | - | 387330 394817 |
| 116 | **Fuel Station Entries**<br>Name: Southside Self Serve<br>Location: 245 Dickenson Road, Rusholme, Manchester, M13 0YW<br>Brand: OBSOLETE<br>Premises Type: Not Applicable<br>**Status: Obsolete**<br>Positional Accuracy: Approximate location provided by supplier | A18NW (N) | 825 | - | 386357 395265 |
| 117 | **Fuel Station Entries**<br>Name: Stamford Garages Ltd<br>Location: 4-8 Stamford Road, Manchester, M13 0SF<br>Brand: Obsolete<br>Premises Type: Not Applicable<br>**Status: Obsolete**<br>Positional Accuracy: Automatically positioned to the address | A23SE (N) | 964 | - | 386853 395430 |

| Agency & Hydrological | Version | Update Cycle |
|---|---|---|
| **Contaminated Land Register Entries and Notices** | | |
| Stockport Metropolitan Borough Council - Environment Team (Land & Water) | December 2014 | Annual Rolling Update |
| Tameside Metropolitan Borough Council - Environmental Health Department | May 2013 | Annual Rolling Update |
| Salford City Council - Environmental Health Department | November 2013 | Annual Rolling Update |
| Trafford Metropolitan Borough Council - Renewal and Environmental Protection | November 2013 | Annual Rolling Update |
| Manchester City Council - Environmental Health Department | September 2014 | Annual Rolling Update |
| **Discharge Consents** | | |
| Environment Agency - North West Region | January 2016 | Quarterly |
| **Enforcement and Prohibition Notices** | | |
| Environment Agency - North West Region | March 2013 | As notified |
| **Integrated Pollution Controls** | | |
| Environment Agency - North West Region | October 2008 | Not Applicable |
| **Integrated Pollution Prevention And Control** | | |
| Environment Agency - North West Region | January 2016 | Quarterly |
| **Local Authority Integrated Pollution Prevention And Control** | | |
| Tameside Metropolitan Borough Council - Environmental Health Department | June 2015 | Annual Rolling Update |
| Salford City Council - Environmental Health Department | March 2015 | Annual Rolling Update |
| Stockport Metropolitan Borough Council - Environmental Health Department, EEDD | October 2014 | Annual Rolling Update |
| Trafford Metropolitan Borough Council - Environmental Health Department | October 2014 | Annual Rolling Update |
| Manchester City Council - Environmental Health Department | September 2014 | Annual Rolling Update |
| **Local Authority Pollution Prevention and Controls** | | |
| Trafford Metropolitan Borough Council - Environmental Health Department | July 2015 | Annual Rolling Update |
| Tameside Metropolitan Borough Council - Environmental Health Department | June 2015 | Annual Rolling Update |
| Salford City Council - Environmental Health Department | March 2015 | Annual Rolling Update |
| Stockport Metropolitan Borough Council - Environmental Health Department, EEDD | October 2014 | Annual Rolling Update |
| Manchester City Council - Environmental Health Department | September 2014 | Annual Rolling Update |
| **Local Authority Pollution Prevention and Control Enforcements** | | |
| Tameside Metropolitan Borough Council - Environmental Health Department | June 2015 | Annual Rolling Update |
| Salford City Council - Environmental Health Department | March 2015 | Annual Rolling Update |
| Stockport Metropolitan Borough Council - Environmental Health Department, EEDD | October 2014 | Annual Rolling Update |
| Trafford Metropolitan Borough Council - Environmental Health Department | October 2014 | Annual Rolling Update |
| Manchester City Council - Environmental Health Department | September 2014 | Annual Rolling Update |
| **Nearest Surface Water Feature** | | |
| Ordnance Survey | July 2012 | Quarterly |
| **Pollution Incidents to Controlled Waters** | | |
| Environment Agency - North West Region | January 2000 | Not Applicable |
| **Prosecutions Relating to Authorised Processes** | | |
| Environment Agency - North West Region | March 2013 | As notified |
| **Prosecutions Relating to Controlled Waters** | | |
| Environment Agency - North West Region | March 2013 | As notified |
| **River Quality** | | |
| Environment Agency - Head Office | November 2001 | Not Applicable |
| **River Quality Biology Sampling Points** | | |
| Environment Agency - Head Office | July 2012 | Annually |
| **River Quality Chemistry Sampling Points** | | |
| Environment Agency - Head Office | July 2012 | Annually |
| **Substantiated Pollution Incident Register** | | |
| Environment Agency - North West Region - South Area | January 2016 | Quarterly |
| **Water Abstractions** | | |
| Environment Agency - North West Region | January 2016 | Quarterly |
| **Water Industry Act Referrals** | | |
| Environment Agency - North West Region | January 2016 | Quarterly |

# Data Currency

| Agency & Hydrological | Version | Update Cycle |
|---|---|---|
| **Groundwater Vulnerability**<br>Environment Agency - Head Office | April 2015 | Not Applicable |
| **Drift Deposits**<br>Environment Agency - Head Office | January 1999 | Not Applicable |
| **Bedrock Aquifer Designations**<br>British Geological Survey - National Geoscience Information Service | October 2012 | As notified |
| **Superficial Aquifer Designations**<br>British Geological Survey - National Geoscience Information Service | January 2015 | As notified |
| **Source Protection Zones**<br>Environment Agency - Head Office | January 2016 | Quarterly |
| **Extreme Flooding from Rivers or Sea without Defences**<br>Environment Agency - Head Office | November 2015 | Quarterly |
| **Flooding from Rivers or Sea without Defences**<br>Environment Agency - Head Office | November 2015 | Quarterly |
| **Areas Benefiting from Flood Defences**<br>Environment Agency - Head Office | November 2015 | Quarterly |
| **Flood Water Storage Areas**<br>Environment Agency - Head Office | November 2015 | Quarterly |
| **Flood Defences**<br>Environment Agency - Head Office | November 2015 | Quarterly |
| **Detailed River Network Lines**<br>Environment Agency - Head Office | March 2012 | Annually |
| **Detailed River Network Offline Drainage**<br>Environment Agency - Head Office | March 2012 | Annually |
| **Surface Water 1 in 30 year Flood Extent**<br>Environment Agency - Head Office | October 2013 | As notified |
| **Surface Water 1 in 100 year Flood Extent**<br>Environment Agency - Head Office | October 2013 | As notified |
| **Surface Water 1 in 1000 year Flood Extent**<br>Environment Agency - Head Office | October 2013 | As notified |
| **Surface Water Suitability**<br>Environment Agency - Head Office | October 2013 | As notified |

| Waste | Version | Update Cycle |
|---|---|---|
| **BGS Recorded Landfill Sites** | | |
| British Geological Survey - National Geoscience Information Service | June 1996 | Not Applicable |
| **Integrated Pollution Control Registered Waste Sites** | | |
| Environment Agency - North West Region | October 2008 | Not Applicable |
| **Licensed Waste Management Facilities (Landfill Boundaries)** | | |
| Environment Agency - North West Region - South Area | October 2015 | Quarterly |
| **Licensed Waste Management Facilities (Locations)** | | |
| Environment Agency - North West Region - South Area | January 2016 | Quarterly |
| **Local Authority Landfill Coverage** | | |
| Manchester City Council - Planning Department | May 2000 | Not Applicable |
| Salford City Council - Environmental Health Department | May 2000 | Not Applicable |
| Stockport Metropolitan Borough Council - Environmental Health Department, EEDD | May 2000 | Not Applicable |
| Tameside Metropolitan Borough Council | May 2000 | Not Applicable |
| Trafford Metropolitan Borough Council - Environmental Health Department | May 2000 | Not Applicable |
| **Local Authority Recorded Landfill Sites** | | |
| Manchester City Council - Planning Department | May 2000 | Not Applicable |
| Salford City Council - Environmental Health Department | May 2000 | Not Applicable |
| Stockport Metropolitan Borough Council - Environmental Health Department, EEDD | May 2000 | Not Applicable |
| Tameside Metropolitan Borough Council | May 2000 | Not Applicable |
| Trafford Metropolitan Borough Council - Environmental Health Department | May 2000 | Not Applicable |
| **Registered Landfill Sites** | | |
| Environment Agency - North West Region - South Area | March 2003 | Not Applicable |
| **Registered Waste Transfer Sites** | | |
| Environment Agency - North West Region - South Area | March 2003 | Not Applicable |
| **Registered Waste Treatment or Disposal Sites** | | |
| Environment Agency - North West Region - South Area | March 2003 | Not Applicable |
| **Hazardous Substances** | **Version** | **Update Cycle** |
| **Control of Major Accident Hazards Sites (COMAH)** | | |
| Health and Safety Executive | June 2015 | Bi-Annually |
| **Explosive Sites** | | |
| Health and Safety Executive | June 2015 | Bi-Annually |
| **Notification of Installations Handling Hazardous Substances (NIHHS)** | | |
| Health and Safety Executive | November 2000 | Not Applicable |
| **Planning Hazardous Substance Enforcements** | | |
| Manchester City Council - Planning Department | February 2016 | Annual Rolling Update |
| Trafford Metropolitan Borough Council | February 2016 | Annual Rolling Update |
| Stockport Metropolitan Borough Council - Environment and Economic Development | November 2014 | Annual Rolling Update |
| Salford City Council | October 2015 | Annual Rolling Update |
| Tameside Metropolitan Borough Council - Planning and Building Control | September 2014 | Annual Rolling Update |
| **Planning Hazardous Substance Consents** | | |
| Manchester City Council - Planning Department | February 2016 | Annual Rolling Update |
| Trafford Metropolitan Borough Council | February 2016 | Annual Rolling Update |
| Stockport Metropolitan Borough Council - Environment and Economic Development | November 2014 | Annual Rolling Update |
| Salford City Council | October 2015 | Annual Rolling Update |
| Tameside Metropolitan Borough Council - Planning and Building Control | September 2014 | Annual Rolling Update |

# Data Currency

| Geological | Version | Update Cycle |
|---|---|---|
| **BGS 1:625,000 Solid Geology**<br>British Geological Survey - National Geoscience Information Service | January 2009 | Not Applicable |
| **BGS Estimated Soil Chemistry**<br>British Geological Survey - National Geoscience Information Service | January 2010 | Annually |
| **BGS Recorded Mineral Sites**<br>British Geological Survey - National Geoscience Information Service | November 2015 | Bi-Annually |
| **BGS Urban Soil Chemistry**<br>British Geological Survey - National Geoscience Information Service | June 2011 | Annually |
| **BGS Urban Soil Chemistry Averages**<br>British Geological Survey - National Geoscience Information Service | June 2011 | Annually |
| **Brine Compensation Area**<br>Cheshire Brine Subsidence Compensation Board | August 2011 | Not Applicable |
| **Coal Mining Affected Areas**<br>The Coal Authority - Property Searches | March 2014 | As notified |
| **Mining Instability**<br>Ove Arup & Partners | October 2000 | Not Applicable |
| **Non Coal Mining Areas of Great Britain**<br>British Geological Survey - National Geoscience Information Service | July 2014 | Not Applicable |
| **Potential for Collapsible Ground Stability Hazards**<br>British Geological Survey - National Geoscience Information Service | June 2015 | Annually |
| **Potential for Compressible Ground Stability Hazards**<br>British Geological Survey - National Geoscience Information Service | June 2015 | Annually |
| **Potential for Ground Dissolution Stability Hazards**<br>British Geological Survey - National Geoscience Information Service | June 2015 | Annually |
| **Potential for Landslide Ground Stability Hazards**<br>British Geological Survey - National Geoscience Information Service | June 2015 | Annually |
| **Potential for Running Sand Ground Stability Hazards**<br>British Geological Survey - National Geoscience Information Service | June 2015 | Annually |
| **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>British Geological Survey - National Geoscience Information Service | June 2015 | Annually |
| **Radon Potential - Radon Affected Areas**<br>British Geological Survey - National Geoscience Information Service | July 2011 | As notified |
| **Radon Potential - Radon Protection Measures**<br>British Geological Survey - National Geoscience Information Service | July 2011 | As notified |
| **Industrial Land Use** | **Version** | **Update Cycle** |
| **Contemporary Trade Directory Entries**<br>Thomson Directories | January 2016 | Quarterly |
| **Fuel Station Entries**<br>Catalist Ltd - Experian | November 2015 | Quarterly |

# Data Currency

| Sensitive Land Use | Version | Update Cycle |
|---|---|---|
| **Areas of Adopted Green Belt** | | |
| Manchester City Council | January 2016 | As notified |
| Salford City Council | January 2016 | As notified |
| Stockport Metropolitan Borough Council | January 2016 | As notified |
| Tameside Metropolitan Borough Council | January 2016 | As notified |
| Trafford Metropolitan Borough Council | January 2016 | As notified |
| **Areas of Unadopted Green Belt** | | |
| Manchester City Council | November 201 | As notified |
| Salford City Council | November 201 | As notified |
| Stockport Metropolitan Borough Council | November 201 | As notified |
| Tameside Metropolitan Borough Council | November 201 | As notified |
| Trafford Metropolitan Borough Council | November 201 | As notified |
| **Areas of Outstanding Natural Beauty** | | |
| Natural England | October 2015 | Bi-Annually |
| **Environmentally Sensitive Areas** | | |
| Natural England | October 2015 | Annually |
| **Forest Parks** | | |
| Forestry Commission | April 1997 | Not Applicable |
| **Local Nature Reserves** | | |
| Natural England | October 2015 | Bi-Annually |
| **Marine Nature Reserves** | | |
| Natural England | October 2015 | Bi-Annually |
| **National Nature Reserves** | | |
| Natural England | October 2015 | Bi-Annually |
| **National Parks** | | |
| Natural England | August 2015 | Bi-Annually |
| **Nitrate Sensitive Areas** | | |
| Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA) | October 2015 | Not Applicable |
| **Nitrate Vulnerable Zones** | | |
| Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA) | October 2015 | Annually |
| **Ramsar Sites** | | |
| Natural England | October 2015 | Bi-Annually |
| **Sites of Special Scientific Interest** | | |
| Natural England | October 2015 | Bi-Annually |
| **Special Areas of Conservation** | | |
| Natural England | October 2015 | Bi-Annually |
| **Special Protection Areas** | | |
| Natural England | October 2015 | Bi-Annually |

# Data Suppliers

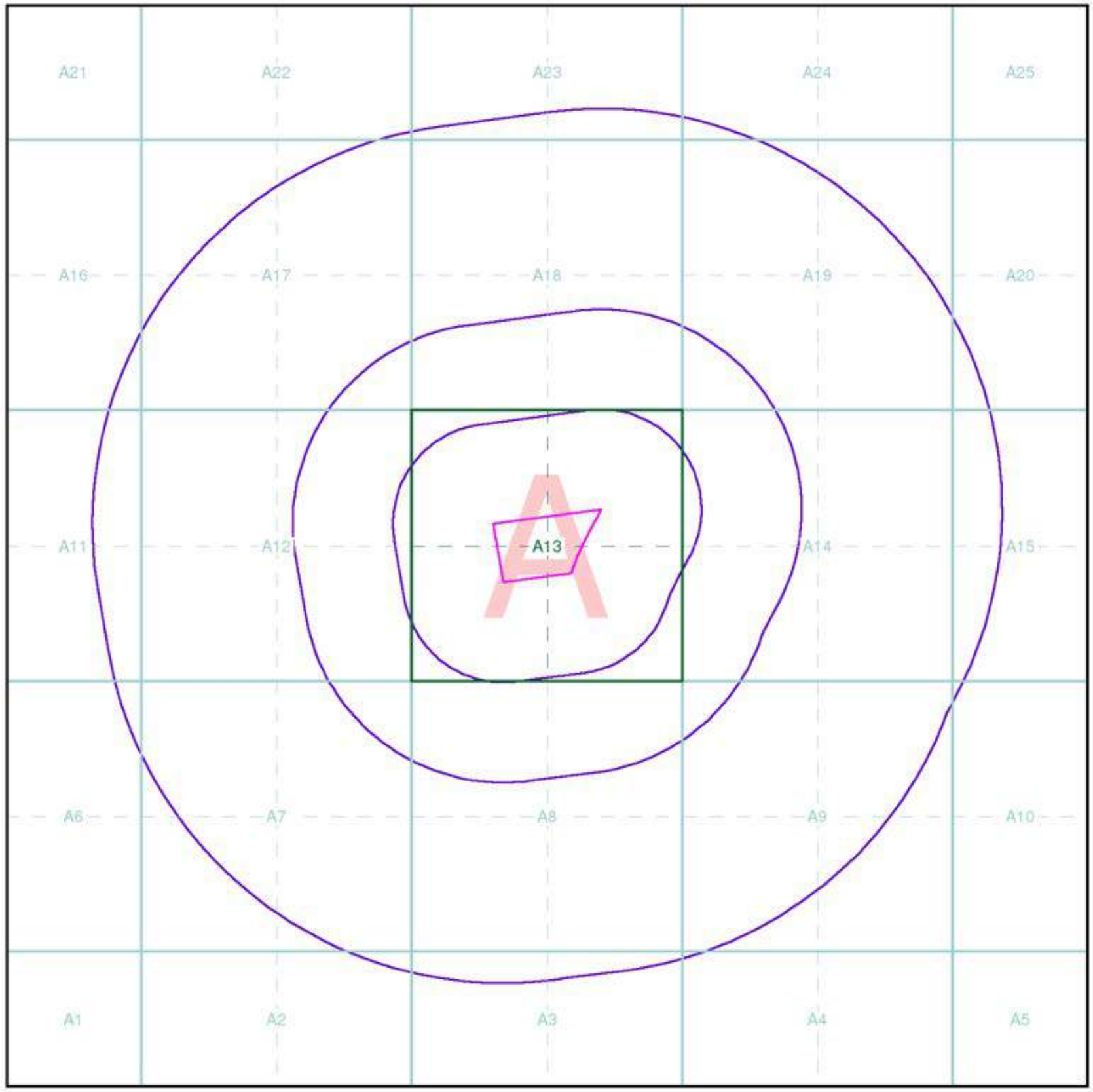
A selection of organisations who provide data within this report

| Data Supplier | Data Supplier Logo |
|---|---|
| **Ordnance Survey** | |
| **Environment Agency** | |
| **Scottish Environment Protection Agency** | |
| **The Coal Authority** | |
| **British Geological Survey** | |
| **Centre for Ecology and Hydrology** | |
| **Natural Resources Wales** | |
| **Scottish Natural Heritage** | |
| **Natural England** | |
| **Public Health England** | |
| **Ove Arup** | |
| **Peter Brett Associates** | |

# Useful Contacts

| Contact | Name and Address | Contact Details |
|---|---|---|
| 2 | **British Geological Survey - Enquiry Service**<br>British Geological Survey, Kingsley Dunham Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG | Telephone: 0115 936 3143<br>Fax: 0115 936 3276<br>Email: enquiries@bgs.ac.uk<br>Website: www.bgs.ac.uk |
| 3 | **Environment Agency - National Customer Contact Centre (NCCC)**<br>PO Box 544, Templeborough, Rotherham, S60 1BY | Telephone: 03708 506 506<br>Email: enquiries@environment-agency.gov.uk |
| 4 | **Manchester City Council - Environmental Health Department**<br>PO Box 463, Town Hall Extension, Albert Square, Manchester, Greater Manchester, M60 3NY | Telephone: 0161 234 4884 / 234 4873.<br>Fax: 0161 234 4508<br>Website: www.manchester.gov.uk |
| 5 | **The Coal Authority - Property Searches**<br>200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG | Telephone: 0345 762 6848<br>Fax: 01623 637 338<br>Email: groundstability@coal.gov.uk |
| 6 | **Natural England**<br>Suite D, Unex House, Bourges Boulevard, Peterborough, Cambridgeshire, PE1 1NG | Telephone: 0845 600 3078<br>Email: enquiries@naturalengland.org.uk<br>Website: www.naturalengland.org.uk |
| 7 | **Environment Agency - Head Office**<br>Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, Avon, BS32 4UD | Telephone: 01454 624400<br>Fax: 01454 624409 |
| 8 | **Manchester City Council - Planning Department**<br>Town Hall, Manchester, Greater Manchester, M60 2LA | Telephone: 0161 234 5000<br>Fax: 0161 234 4508<br>Website: www.manchester.gov.uk |
| - | **Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards**<br>Chilton, Didcot, Oxfordshire, OX11 0RQ | Telephone: 01235 822622<br>Fax: 01235 833891<br>Email: radon@phe.gov.uk<br>Website: www.ukradon.org |
| - | **Landmark Information Group Limited**<br>Imperium, Imperial Way, Reading, Berkshire, RG2 0TD | Telephone: 0844 844 9952<br>Fax: 0844 844 9951<br>Email: customerservices@landmarkinfo.co.uk<br>Website: www.landmarkinfo.co.uk |

Please note that the Environment Agency / Natural Resources Wales / SEPA have a charging policy in place for enquiries.




RAMBOLL ENVIRON

## Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

**Slice**
Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

**Segment**
A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

**Quadrant**
A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

---

A selection of organisations who provide data within this report:

Ordnance Survey Licensed Partner

British Geological Survey

Environment Agency

NATURAL ENGLAND

Envirocheck reports are compiled from 136 different sources of data.

## Client Details

Mr S Miller, Ramboll UK Ltd, 2nd Floor, The Exchange, Chester, CH 1 1DA

## Order Details

| | |
|---|---|
| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386550, 394390 |
| Site Area (Ha): | 3.21 |
| Search Buffer (m): | 1000 |

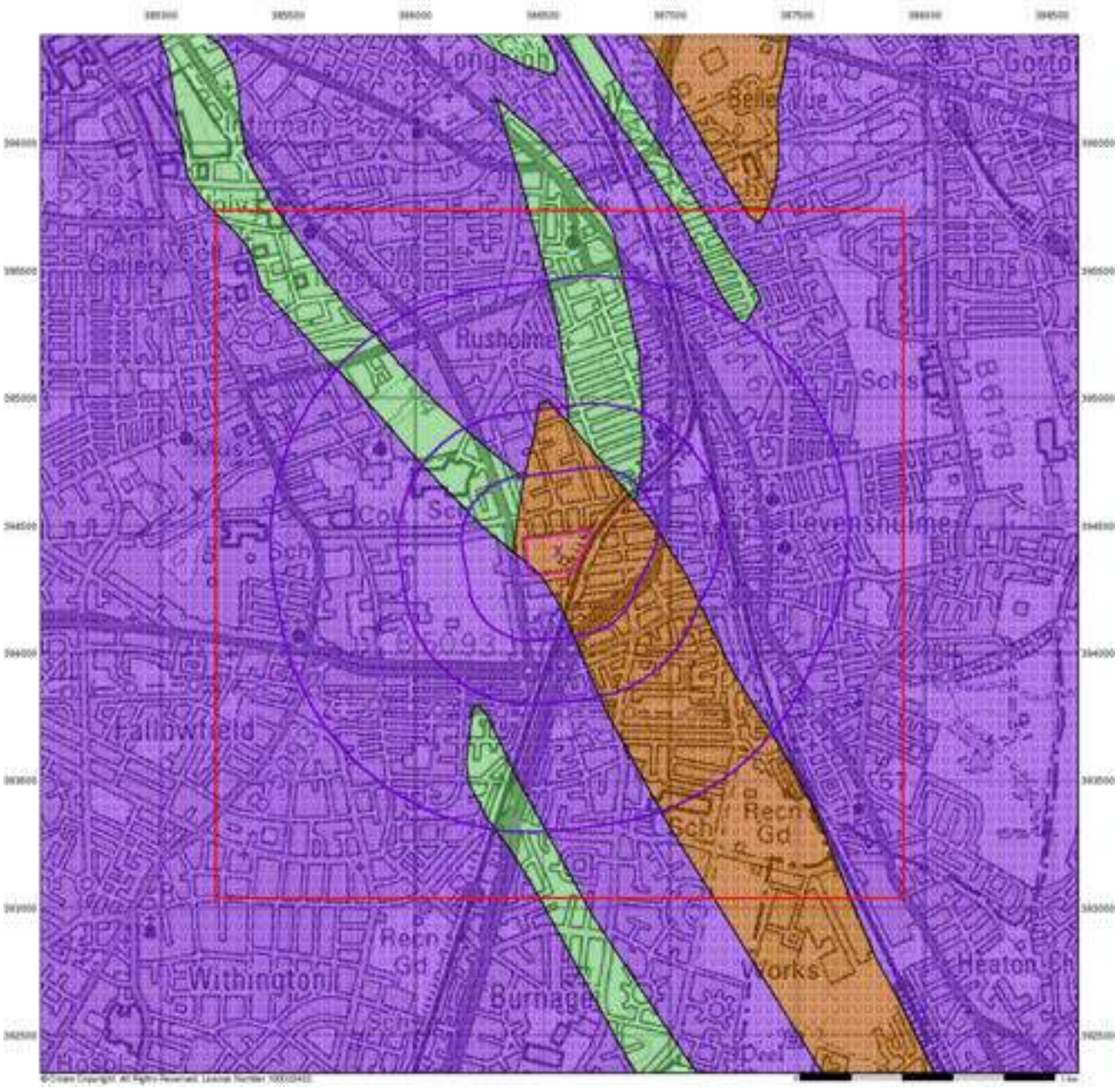
## Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

**Full Terms and Conditions can be found on the following link:**
http://www.landmarkinfo.co.uk/Terms/Show/515

Landmark Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk




RAMBOLL ENVIRON

# Groundwater Vulnerability

## General

Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

## Agency and Hydrological

| Geological Classes | Soil Classes |
|---|---|
| Major Aquifer (Highly Permeable) | High (H) 1, 2, 3, U |
| | Intermediate (I) 1, 2 |
| | Low |
| Minor Aquifer (Variably Permeable) | High (H) 1, 2, 3, U |
| | Intermediate (I) 1, 2 |
| | Low |
| Non Aquifer (Negligibly Permeable) | |
| Water or Sea | |
| Drift Deposit | |

## Site Sensitivity Context Map - Slice A

## Order Details

| | |
|---|---|
| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386560, 394400 |
| Slice: | A |
| Site Area (Ha): | 3.21 |
| Search Buffer (m): | 1000 |

## Site Details

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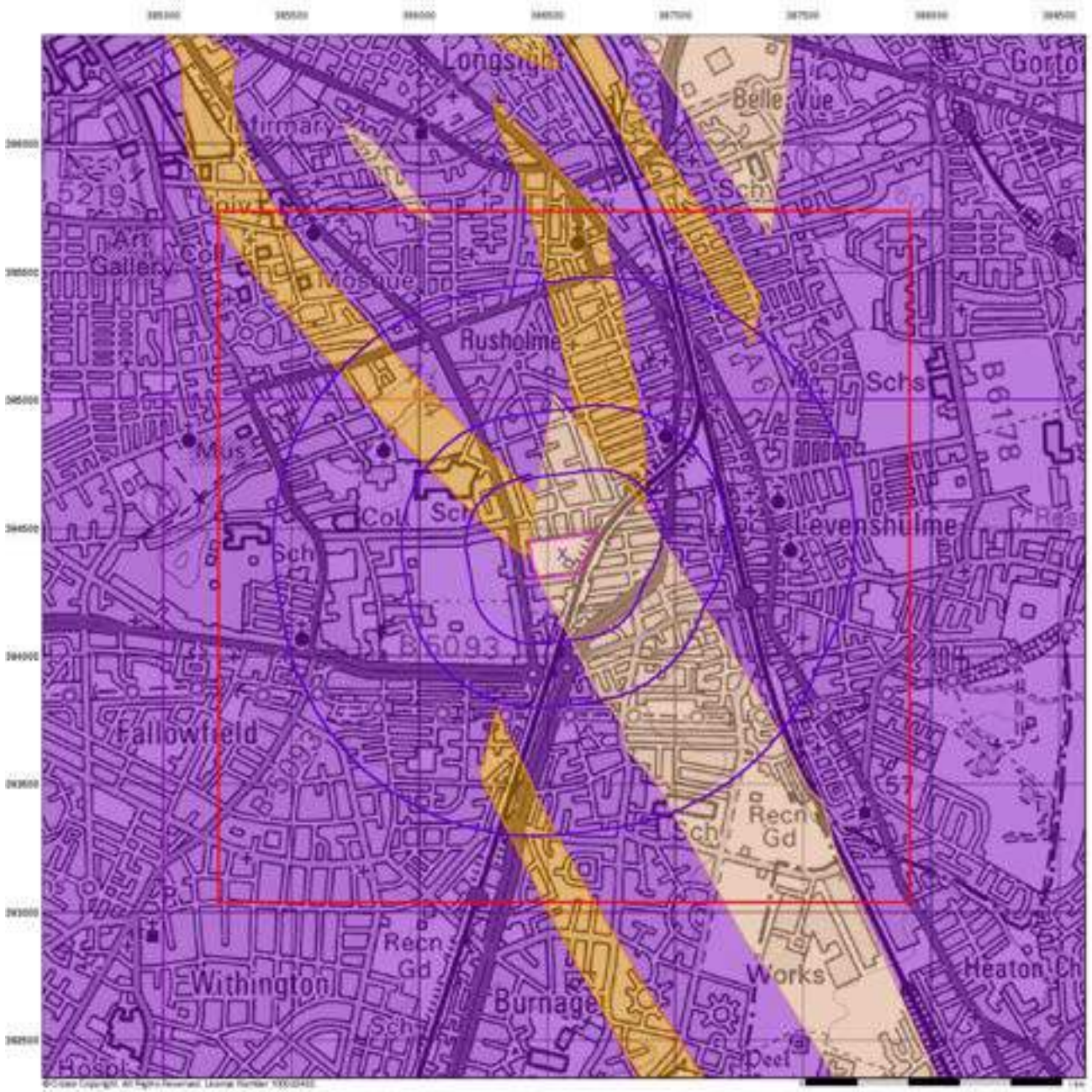
Landmark
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk




RAMBOLL ENVIRON

# Bedrock Aquifer Designation

## General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

## Agency and Hydrological

### Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown

## Site Sensitivity Context Map - Slice A

## Order Details

| | |
|---|---|
| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386560, 394400 |
| Slice: | A |
| Site Area (Ha): | 3.21 |
| Search Buffer (m): | 1000 |

## Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

RAMBOLL ENVIRON

# Superficial Aquifer Designation

**General**

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

**Agency and Hydrological**

**Geological Classes**

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown

## Site Sensitivity Context Map - Slice A

## Order Details

| | |
|---|---|
| Order Number: | 80427581_1_1 |
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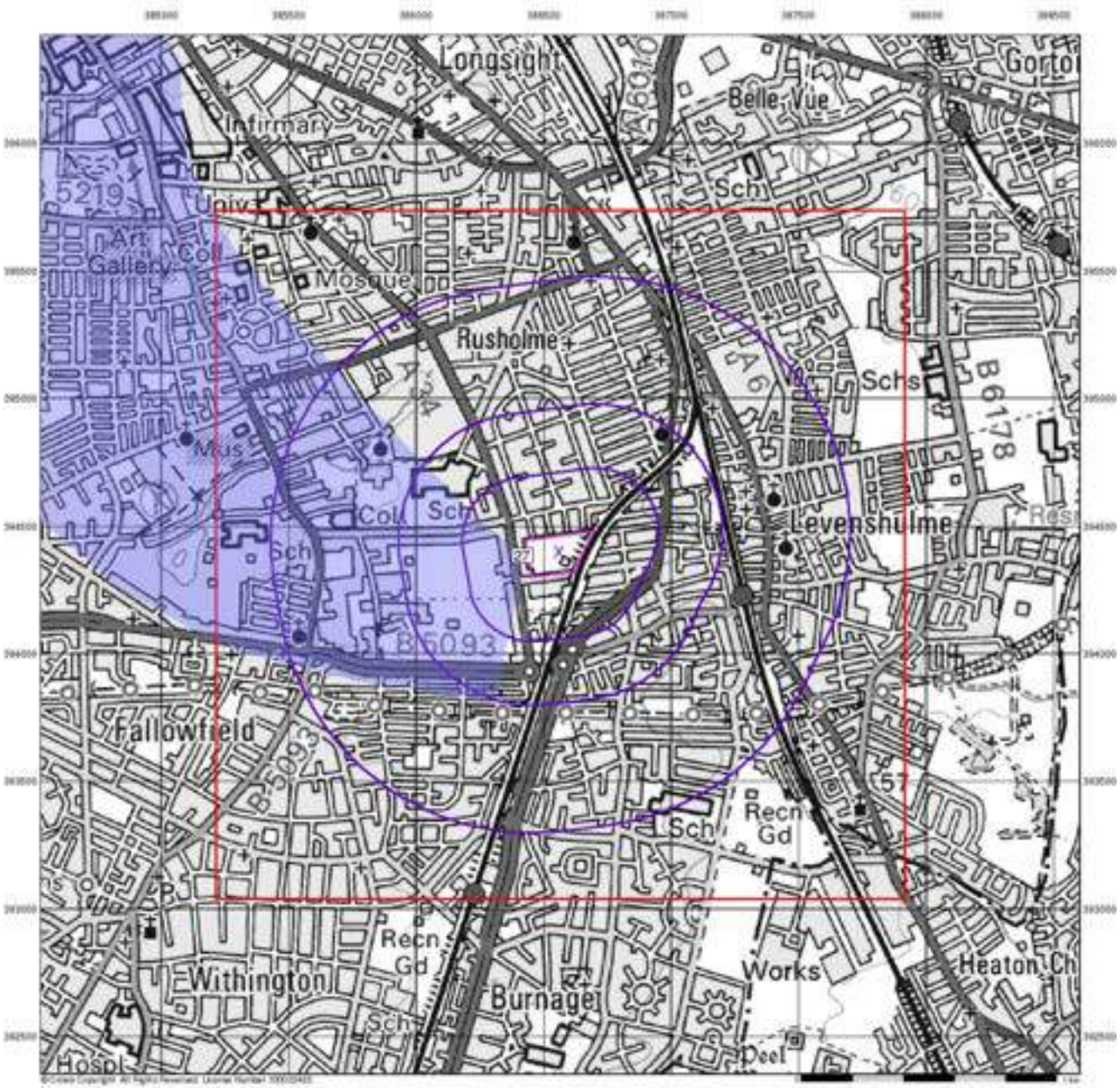
| Slice: | A |
| Site Area (Ha): | 3.21 |
| Search Buffer (m): | 1000 |

## Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL




RAMBOLL ENVIRON

## Source Protection Zones

**General**

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

**Agency and Hydrological**

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)
- Source Protection Zone Borehole

### Site Sensitivity Context Map - Slice A

### Order Details

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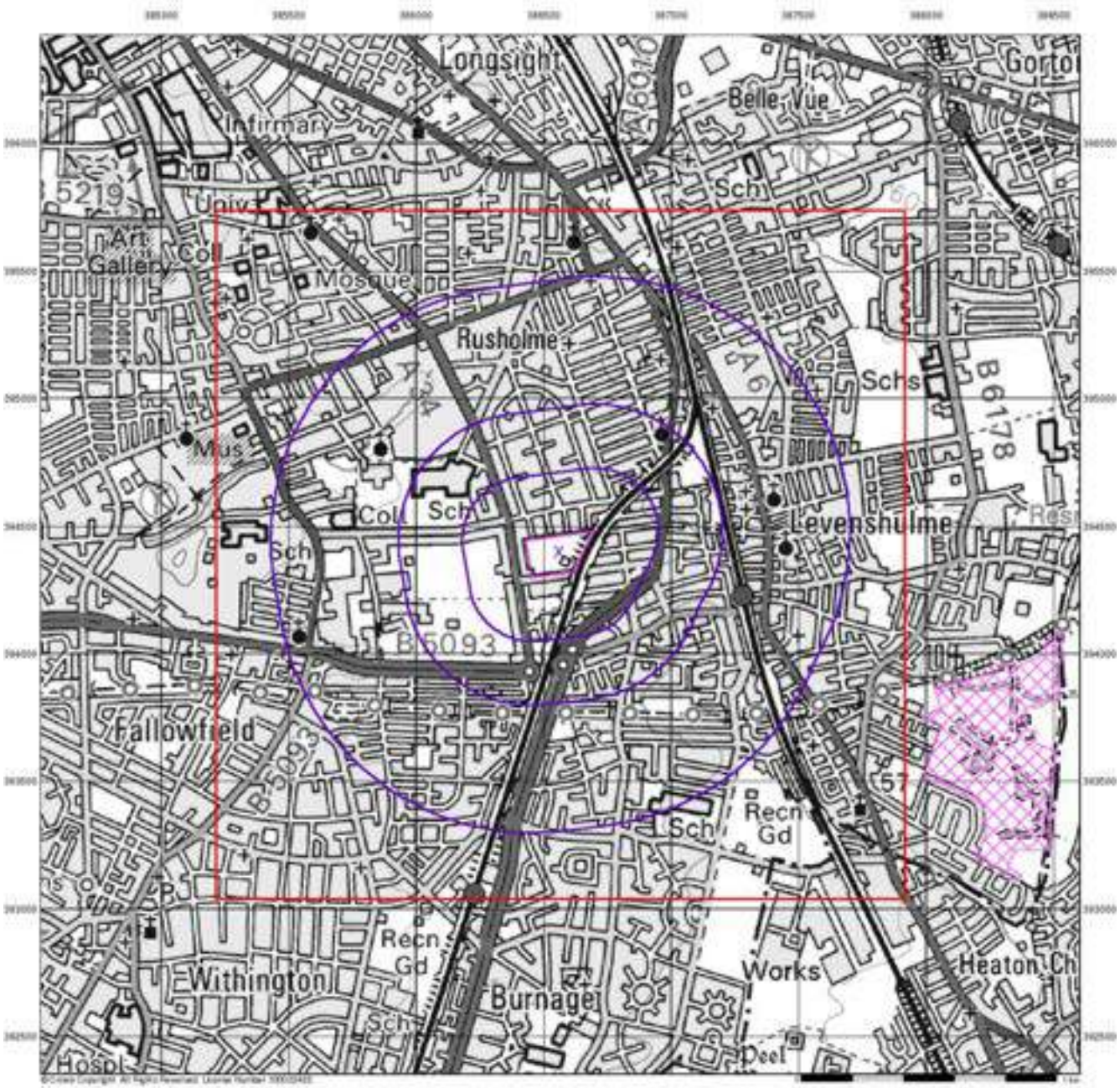


RAMBOLL ENVIRON

## Sensitive Land Uses

**General**

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

**Sensitive Land Uses**

- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area

### Site Sensitivity Context Map - Slice A

### Order Details

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Landmark
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

# Geology 1:10,000 Maps Legends

## Artificial Ground and Landslip

| Map Colour | Lex Code | Rock Name | Rock Type | Min and Max Age |
|---|---|---|---|---|
| | WMGR | Infilled Ground | Artificial Deposit | Holocene - Holocene |
| | MGR | Made Ground (Undivided) | Artificial Deposit | Holocene - Holocene |
| | WGR | Worked Ground (Undivided) | Void | Holocene - Holocene |

## Superficial Geology

| Map Colour | Lex Code | Rock Name | Rock Type | Min and Max Age |
|---|---|---|---|---|
| | TILLD | Till, Devensian | Diamicton | Devensian - Ipswichian |
| | GFICD | Glaciofluvial Ice Contact Deposits, Devensian | Sand and Gravel | Devensian - Ipswichian |

## Bedrock and Faults

| Map Colour | Lex Code | Rock Name | Rock Type | Min and Max Age |
|---|---|---|---|---|
| | CPB | Chester Pebble Beds Formation | Sandstone | Early Triassic - Early Triassic |
| | MM | Manchester Marls Formation | Mudstone | Late Permian - Late Permian |
| | CS | Collyhurst Sandstone Formation | Sandstone | Cisuralian - Cisuralian |
| | HA | Halesowen Formation | Mudstone, Siltstone and Sandstone | Westphalian D - Westphalian D |
| | ETM | Etruria Formation | Sandstone and Mudstone | Westphalian - Westphalian |
| | Fault | | | |

RAMBOLL ENVIRON

## Geology 1:10,000 Maps

This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:10,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around a site. This mapping may be more up to date than previously published paper maps.

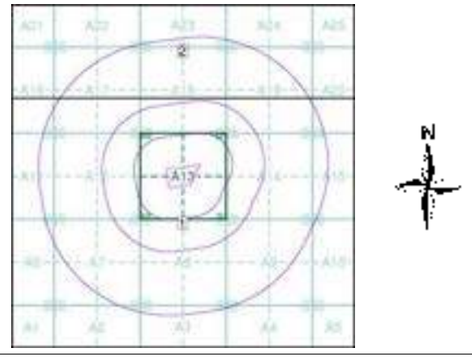
The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page.

Please Note: Not all of the layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

## Geology 1:10,000 Maps Coverage

| | | | |
|---|---|---|---|
| **Map ID:** | 1 | **Map ID:** | 2 |
| **Map Name:** | SJ89SE | **Map Name:** | SJ89NE |
| **Map Date:** | 2008 | **Map Date:** | 1976 |
| **Bedrock Geology:** | Available | **Bedrock Geology:** | Available |
| **Superficial Geology:** | Available | **Superficial Geology:** | Available |
| **Artificial Geology:** | Available | **Artificial Geology:** | Available |
| **Faults:** | Available | **Faults:** | Available |
| **Landslip:** | Not Available | **Landslip:** | Available |
| **Rock Segments:** | Not Available | **Rock Segments:** | Available |

## Geology 1:10,000 Maps - Slice A




## Order Details

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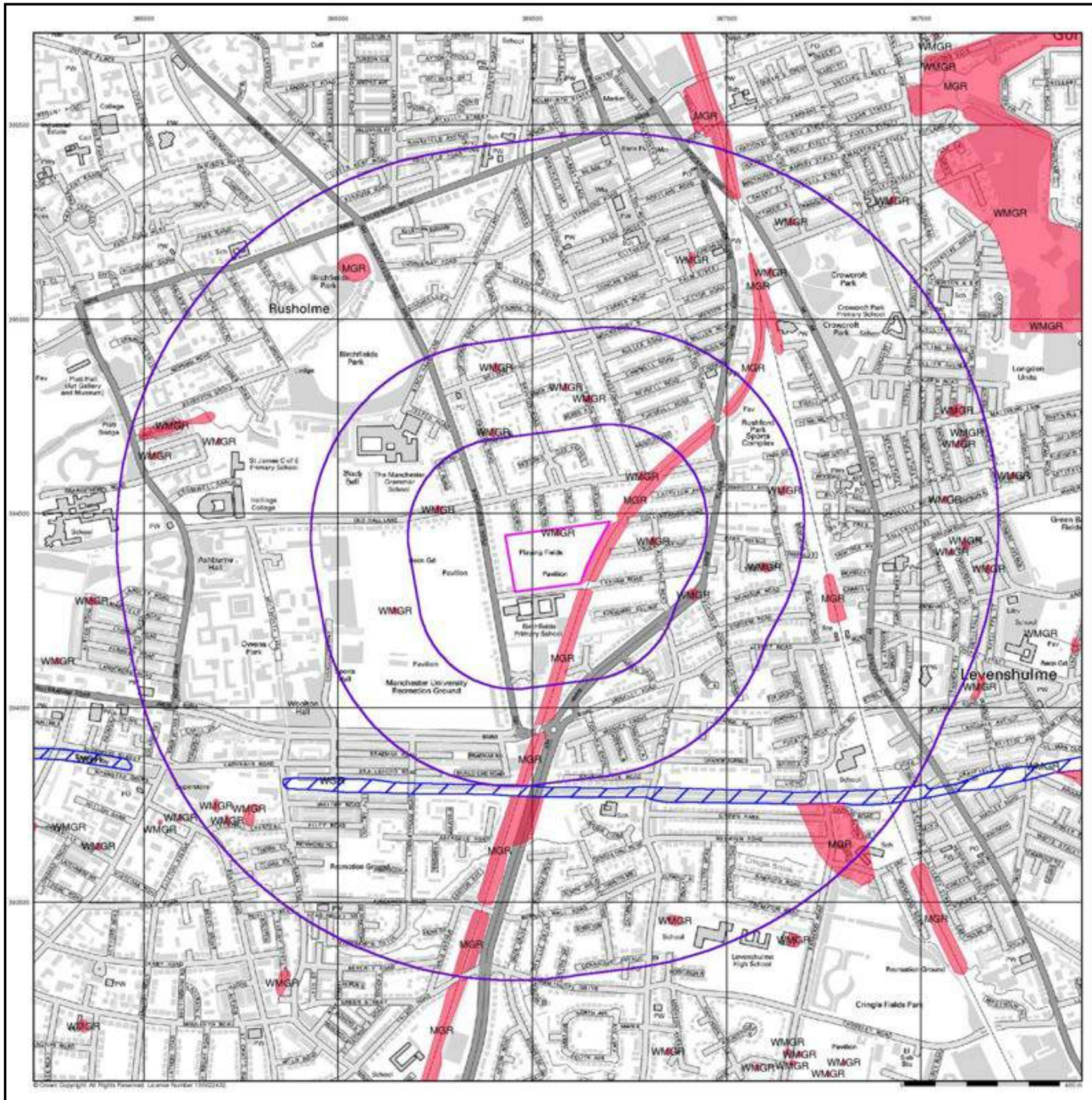
## Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL


Rusholme
Levenshulme
WMGR
MGR
Birchfields Park
Crowcroft Park
Platt Hall (Art Gallery and Museum)
St James C of E Primary School
The Manchester Grammar School
Hastings College
Ashburne Hall
Pavilion
Manchester University Recreation Ground
Levenshulme High School
Cringle Fields Farm
Longsight Units
Rusholme Park Sports Complex
Crowcroft Park Primary School
Birchfields Primary School
Queens Park
Recreation Ground
Playing Fields
Tennis Cts
Bowling Green
Sports Hall
Weaste Hall
Cricket Ground
Old Hall Lane
Lytham Road
Stockport Road
Wilmslow Road
Dickenson Road
Princess Road
Mauldeth Road
Kingsway
Yew Tree Road
Claremont Road
Rusholme Road
Fallowfield
Levenshulme Road
Longley Lane
Slade Lane
Broadhurst Park
Cringle Fields Park
Recreation Ground
Pavilion
Sch
Coll
Cem
Mkt
Fav
Pav
Pk
Ch
Lib
PO
Sta
Hosp
Ind Est
Sub Sta
Works
Depot
Gdns
Ct
Cres
Dr
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Ave
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Wk
Cl
Mt
Vw
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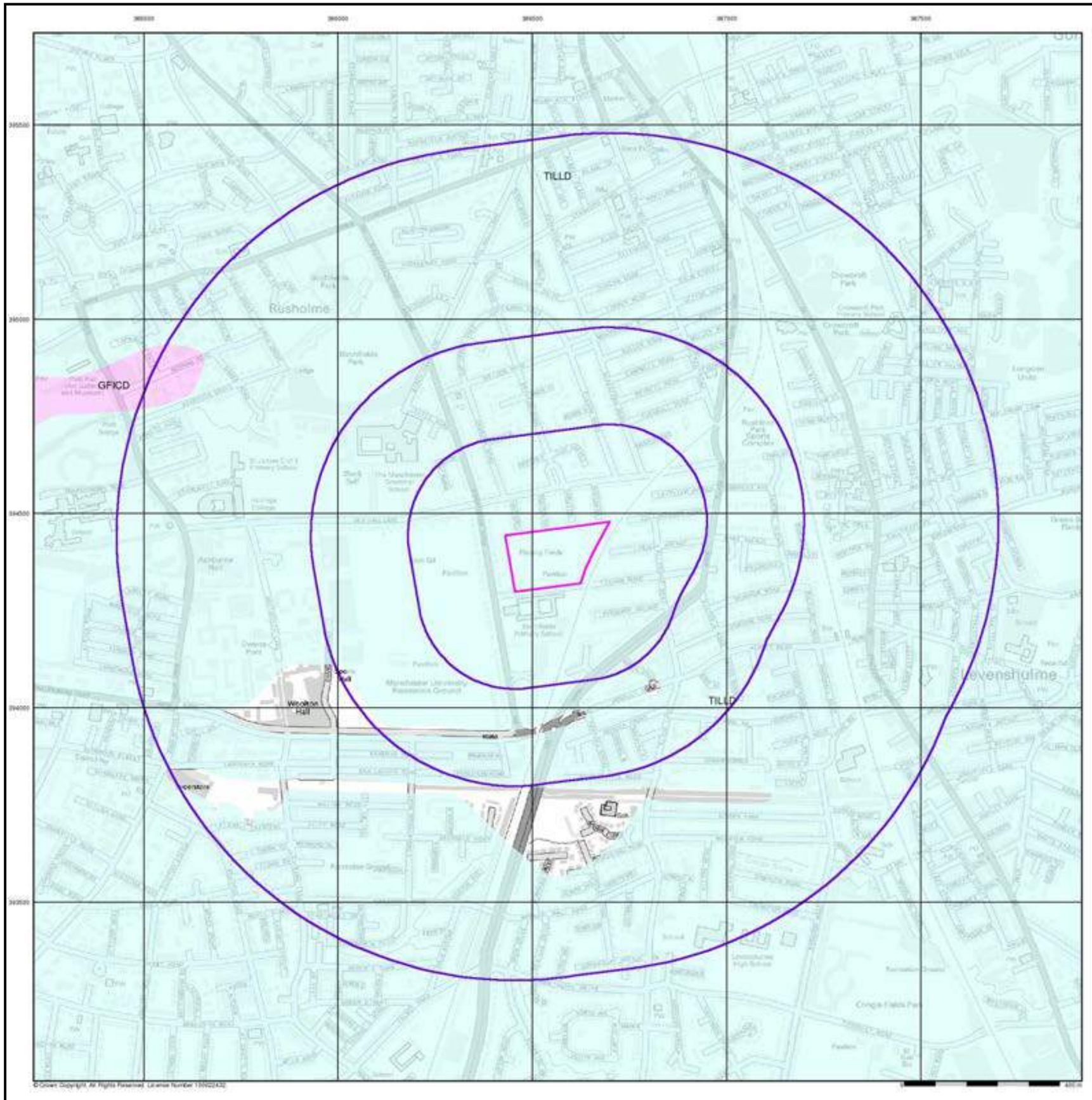
Bdy
Fm
Cott
Ho
Mans
Bldgs
Ter
Yd
Mews
Pas
Arc
Sub
Fld
Grn
Hill
Brow
Bank
Side
Way
Path
Track
Drive
Entrance
Exit
Junction
Roundabout
Crossroads
Bridge
Tunnel
Ford
Weir
Lock
Canal
River
Stream
Brook
Pond
Lake
Reservoir
Marsh
Wood
Trees
Scrub
Heath
Moor
Cliff
Quarry
Pit
Tip
Landfill
Mine
Shaft
Adit
Level
Tramway
Railway
Station
Platform
Siding
Goods
Yard
Shed
Turntable
Buffer
Stop
Signal
Box
Gantry
Crane
Hoist
Conveyor
Belt
Hopper
Chute
Silo
Tank
Gasholder
Pipeline
Valve
Meter
Pump
Compressor
Boiler
Furnace
Kiln
Oven
Chimney
Stack
Flue
Duct
Vent
Fan
Motor
Generator
Transformer
Switchgear
Substation
Pylon
Mast
Tower
Aerial
Dish
Antenna
Radar
Beacon
Light
Lighthouse
Buoy
Mooring
Jetty
Pier
Wharf
Dock
Basin
Lock
Slipway
Boatyard
Marina
Harbour
Port
Airport
Runway
Taxiway
Apron
Hangar
Terminal
Control
Tower
Helipad
Heliport
Airfield
Aerodrome
Flying
Field
Club
House
Pavilion
Changing
Rooms
Toilets
Showers
Lockers
Gym
Pool
Court
Pitch
Track
Field
Ground
Stadium
Arena
Course
Golf
Bowling
Green
Tennis
Cricket
Football
Rugby
Hockey
Athletics
Cycling
Motor
Racing
Circuit
Speedway
Dog
Track
Kennels
Stables
Riding
School
Equestrian
Centre
Livery
Yard
Paddock
Field
Meadow
Pasture
Arable
Crop
Orchard
Vineyard
Nursery
Garden
Allotment
Glasshouse
Polytunnel
Barn
Shed
Store
Warehouse
Depot
Yard
Workshop
Factory
Mill
Brewery
Distillery
Bakery
Abattoir
Slaughterhouse
Dairy
Creamery
Cheese
Maker
Butcher
Baker
Grocer
Supermarket
Shop
Store
Market
Hall
Arcade
Centre
Mall
Precinct
Pedestrian
Zone
Car
Park
Multi-storey
Underground
Garage
Petrol
Station
Filling
Service
Area
Motorway
Junction
Slip
Road
Dual
Carriageway
Single
Carriageway
Roundabout
Flyover
Underpass
Subway
Footbridge
Cycle
Track
Path
Bridleway
Footpath
Public
Right
Of
Way
Access
Land
Open
Space
Common
Village
Green
Park
Garden
Cemetery
Churchyard
Memorial
Statue
Fountain
Clock
Tower
Monument
Ruin
Castle
Fort
Battery
Earthworks
Tumulus
Barrow
Cairn
Standing
Stone
Circle
Henge
Roman
Camp
Settlement
Hillfort
Enclosure
Dyke
Ditch
Bank
Wall
Fence
Hedge
Gate
Stile
Boundary
Post
Milestone
Signpost
Bench
Shelter
Toilet
Drinking
Fountain
Litter
Bin
Recycling
Point
Car
Park
Coach
Park
Lorry
Park
Layby
Passing
Place
Turning
Circle
Roundabout
Mini
Roundabout
Traffic
Island
Crossing
Zebra
Pelican
Puffin
Toucan
Pedestrian
Refuge
Island
Central
Reservation
Hard
Shoulder
Verge
Footway
Kerb
Gutter
Drain
Gully
Manhole
Inspection
Chamber
Soakaway
Culvert
Ford
Causeway
Bridge
Viaduct
Aqueduct
Tunnel
Portal
Cutting
Embankment
Retaining
Wall
Gabion
Revetment
Groyne
Breakwater
Sea
Wall
Flood
Defence
Barrier
Gate
Sluice
Weir
Fish
Pass
Eel
Ladder
Navigation
Light
Beacon
Buoy
Mooring
Post
Ring
Bollard
Cleat
Fender
Ladder
Steps
Handrail
Guardrail
Parapet
Coping
Cornice
Pilaster
Buttress
Arch
Vault
Dome
Spire
Steeple
Belfry
Bell
Tower
Clock
Face
Weathervane
Finial
Gargoyle
Boss
Keystone
Voussoir
Lintel
Sill
Jamb
Mullion
Transom
Tracery
Window
Door
Porch
Canopy
Awning
Shutter
Grille
Vent
Flue
Chimney
Pot
Cowl
Roof
Ridge
Hip
Valley
Gable
Eaves
Soffit
Fascia
Gutter
Downpipe
Rainwater
Head
Hopper
Box
Gutter
Parapet
Gutter
Scupper
Drain
Pipe
Manhole
Cover
Inspection
Chamber
Soakaway
Septic
Tank
Cesspool
Sewage
Treatment
Works
Pumping
Station
Rising
Main
Outfall
Pipe
Culvert
Aqueduct
Flume
Sluice
Gate
Penstock
Turbine
Generator
Transformer
Substation
Switchgear
Control
Room
Office
Workshop
Store
Yard
Compound
Fence
Gate
Barrier
Security
Post
Camera
Lighting
Column
Floodlight
Sign
Notice
Board
Information
Point
Map
Board
Interpretation
Panel
Leaflet
Box
Bench
Seat
Picnic
Table
Shelter
Toilet
Block
Drinking
Water
Tap
Litter
Bin
Recycling
Point
Dog
Waste
Bin
Ashtray
Cigarette
Bin
Car
Park
Ticket
Machine
Barrier
Gate
Height
Restriction
Bar
Weight
Limit
Sign
Speed
Limit
Sign
Traffic
Light
Pedestrian
Crossing
Zebra
Crossing
Pelican
Crossing
Puffin
Crossing
Toucan
Crossing
Refuge
Island
Central
Reservation
Hard
Shoulder
Verge
Footway
Kerb
Gutter
Drain
Gully
Manhole
Cover



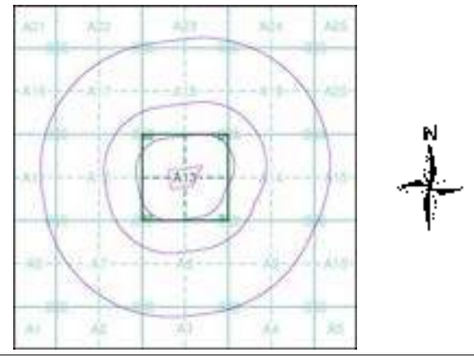

## Superficial Geology

BGS 1:10,000 Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

## Superficial Geology Map - Slice A

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## Site Details

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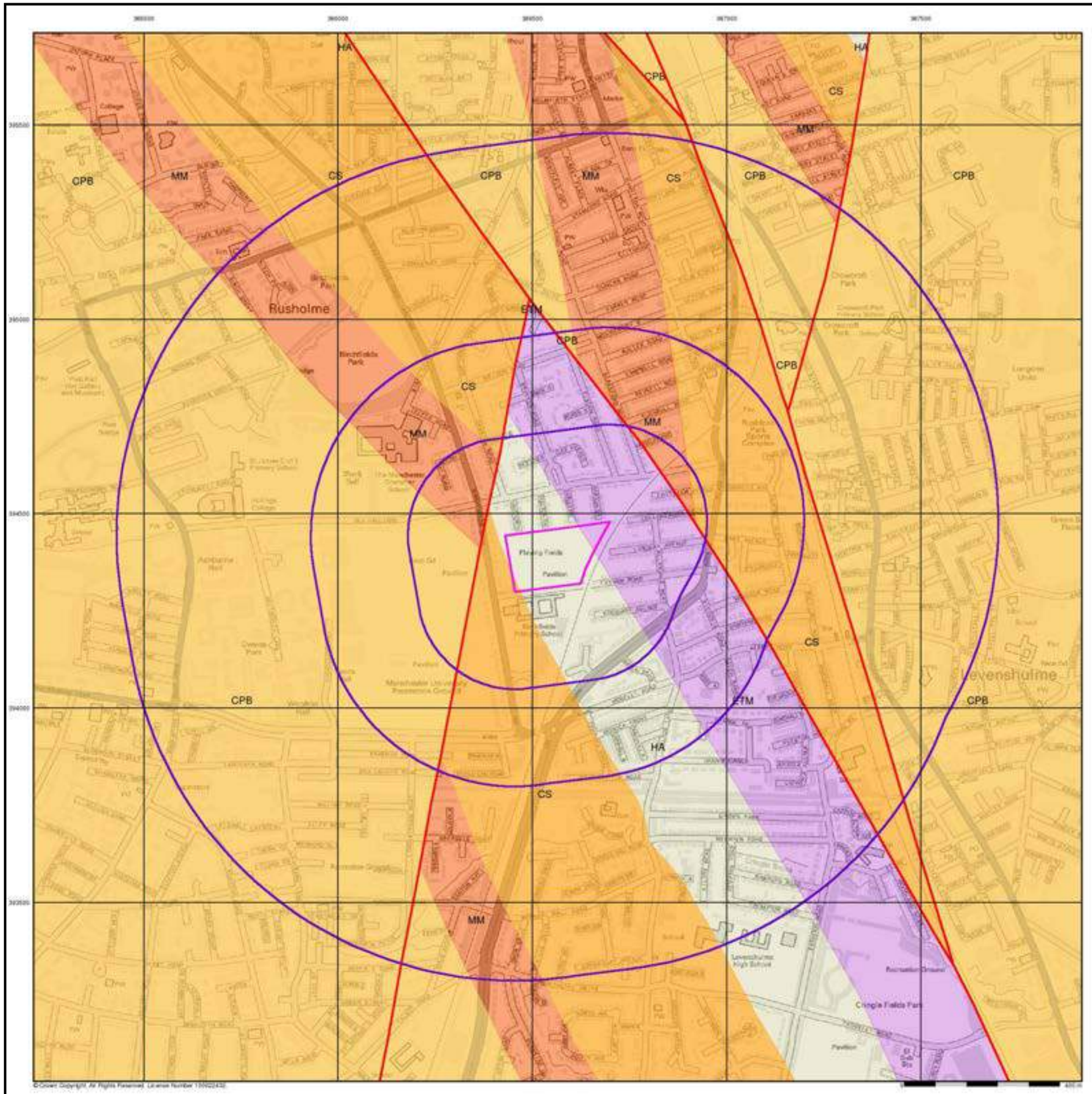
HA
CPB
CS
MM
CPB
CS
MM
CPB
CPB
CPB
Rusholme
MM
CPB
CS
MM
CPB
MM
CS
CPB
CPB
HA
CS
MM
Levenshulme
Chorlton Park
Longford Park
Fallowfield
Platt Fields Park
Birchfields Primary School
Levenshulme High School
Cringle Fields Park
Pavilion
Recreation Ground
Sports Ground
Tennis Courts
Allotments
Cricket Pitch
Bowling Green
Pitch
Pond
Church
Library
Public Toilets
Nursery
Sub Sta
Works
Tce
Rd
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Ret
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Cem
Crem
Ref
Ware
Sch
Ground
Pitch
Court
Track
Pond

## Combined Surface Geology

The Combined Surface Geology map combines all the previous maps into one combined geological overview of your site.

Please consult the legends to the previous maps to interpret the Combined "Surface Geology" map.

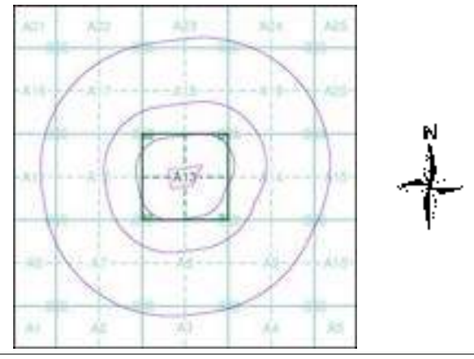
### Additional Information

More information on 1:10,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

### Contact

British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Telephone: 0115 936 3143
Fax: 0115 936 3276
email: enquiries@bgs.ac.uk
website: www.bgs.ac.uk

## Combined Geology Map - Slice A

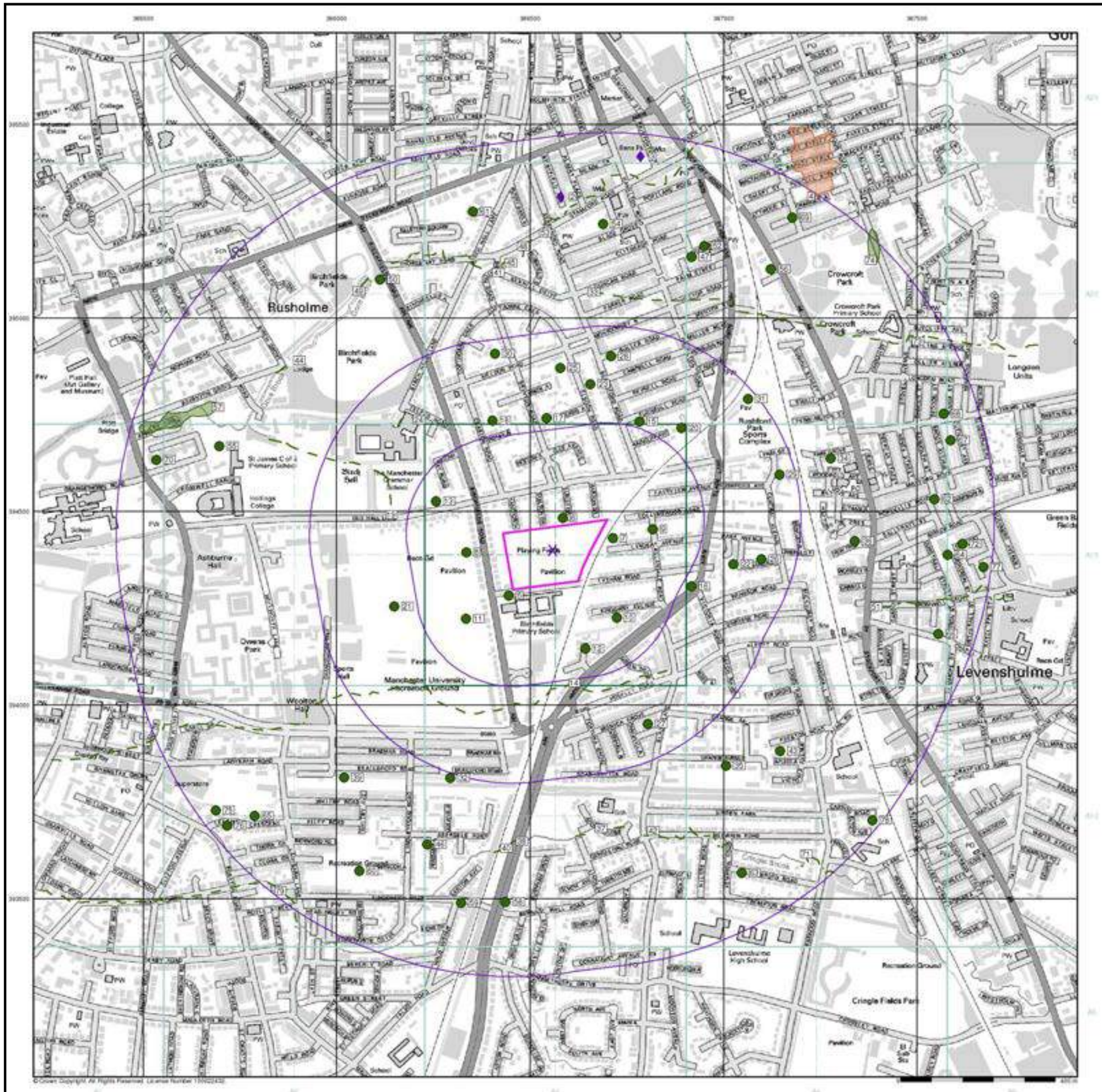


## Order Details

| | |
|---|---|
| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386560, 394400 |
| Slice: | A |
| Site Area (Ha): | 3.21 |
| Search Buffer (m): | 1000 |

## Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

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RAMBOLL ENVIRON

# Historical Land Use Information (1:10,000)

## General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Map ID

Several of Type at Location

## Potentially Contaminative Industrial Uses (Past Land Uses - Mining)

| | Point | Line | Polygon |
|---|---|---|---|
| Air Shafts | ◆ | | |
| Disturbed Ground | ◆ | | |
| General Quarrying | ◆ | | |
| Heap, unknown constituents | ◆ | | |
| Mineral Railway | ◆ | | |
| Mining and Quarrying General | ◆ | | |
| Mining of Coal & Lignite | ◆ | | |
| Quarrying of Sand and Clay, Operation of Sand and Gravel Pits | ◆ | | |

## Historical Land Use

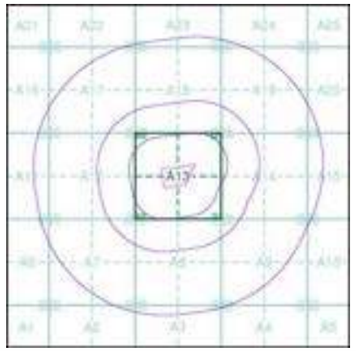
| | Point | Line | Polygon |
|---|---|---|---|
| Potentially Infilled Land (Non-Water) | ● | | |
| Potentially Infilled Land (Water) | ● | | |
| Former Marsh | ✠ | | |

## Mining Data

Potential Mining Area

BGS Recorded Mineral Site

## Mining and Ground Stability - Slice A




## Order Details

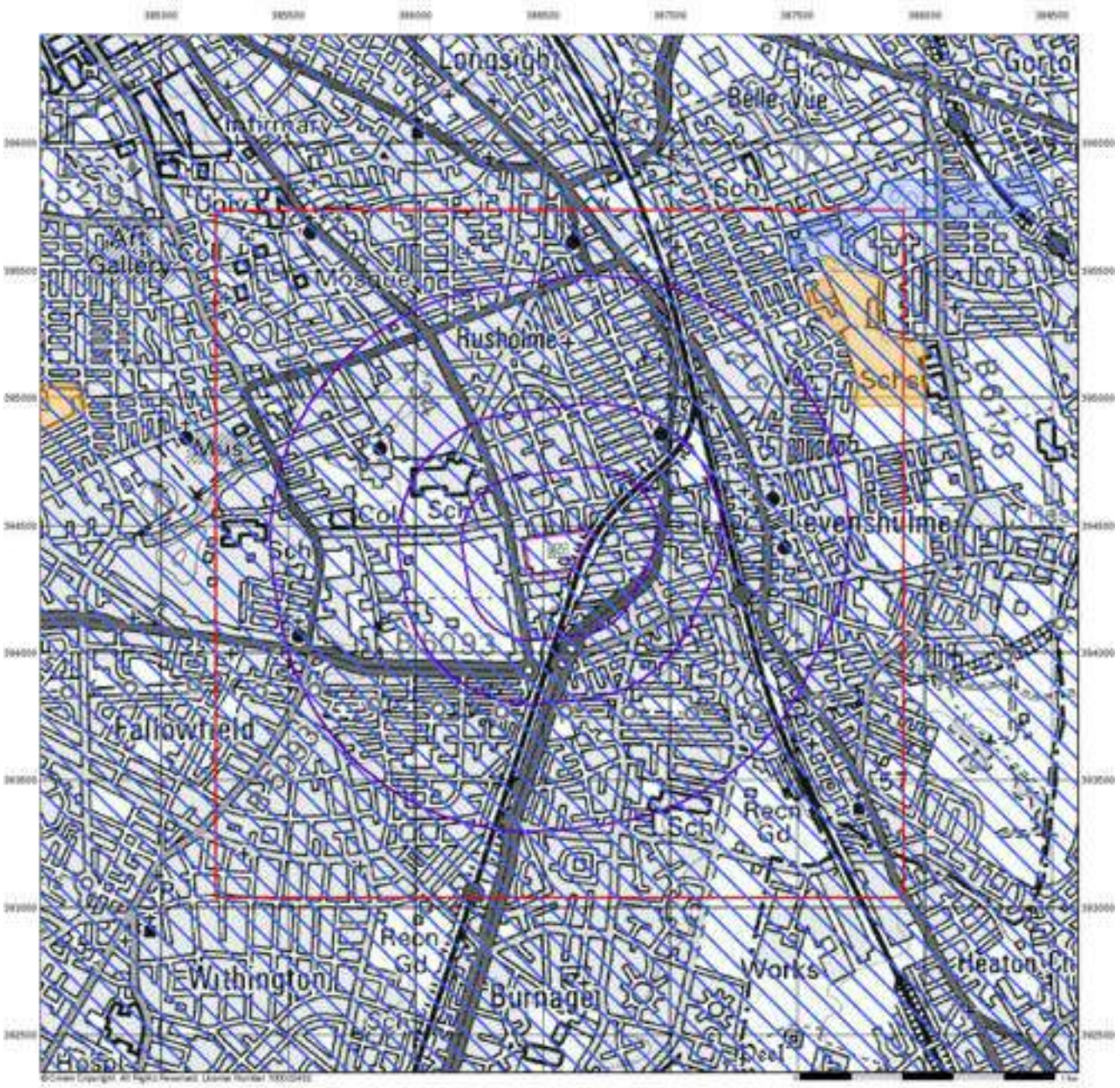
| | |
|---|---|
| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386560, 394400 |
| Slice: | A |
| Site Area (Ha): | 3.21 |
| Search Buffer (m): | 1000 |

## Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

Landmark

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk




RAMBOLL ENVIRON

## Ground Stability Data (1:50,000)

**General**

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

**Potential for Compressible Ground Stability Hazards**

High | Low | Moderate | Very Low

**Potential for Collapsible Ground Stability Hazards**

High | Low | Moderate | Very Low

**Brine Pumping and Salt Mining** — Point | Polygon

Brine Pumping Related Feature

Salt Mining Related Feature

### Mining and Ground Stability - Slice A

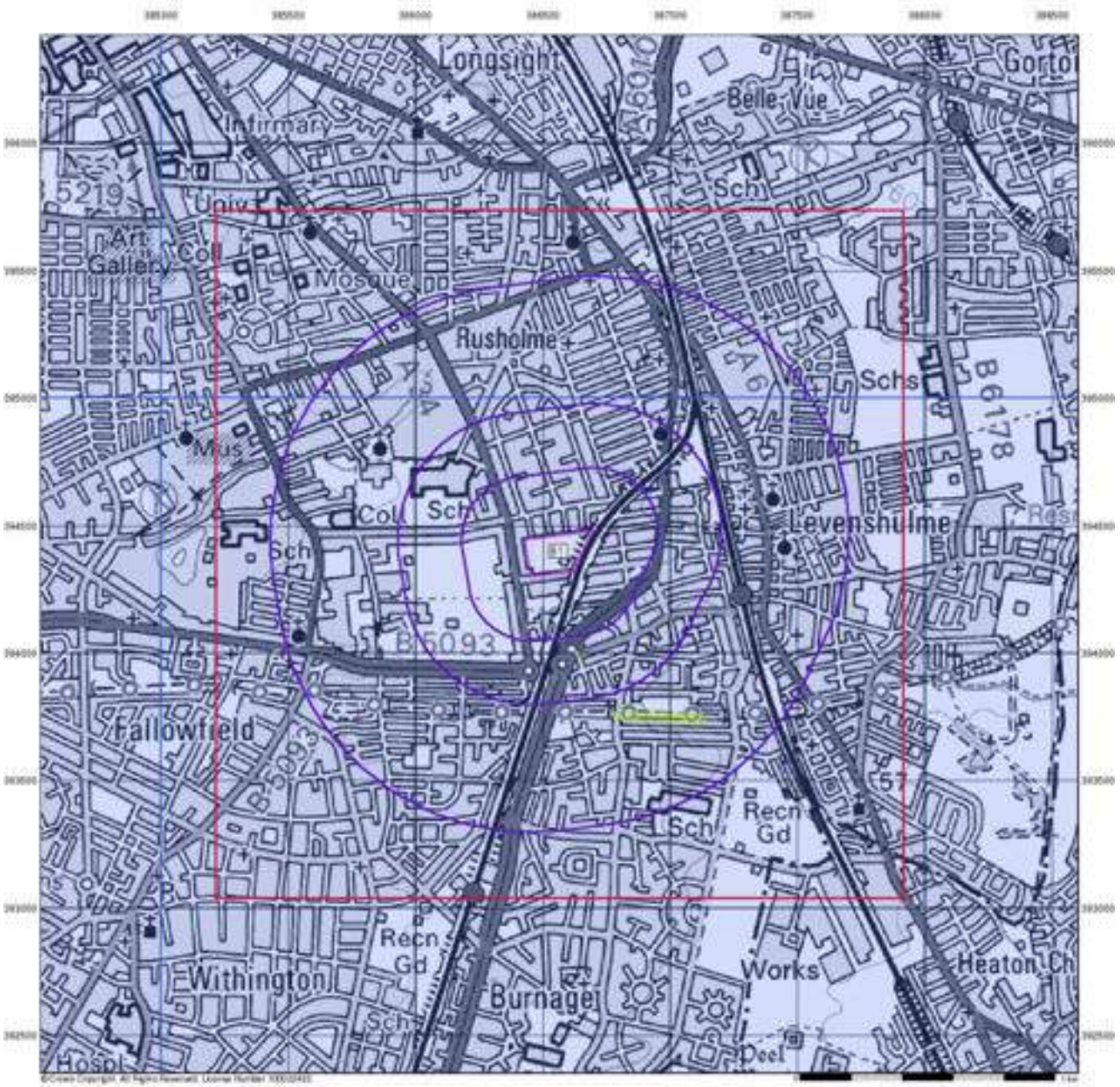
### Order Details

| | |
|---|---|
| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386560, 394400 |
| Slice: | A |
| Site Area (Ha): | 3.21 |
| Search Buffer (m): | 1000 |

### Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

Landmark
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk




RAMBOLL ENVIRON

## Ground Stability Data (1:50,000)

**General**

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

**Potential for Landslide Ground Stability Hazards**

High | Low | Moderate | Very Low

**Potential for Ground Dissolution Stability Hazards**

High | Low | Moderate | Very Low

### Mining and Ground Stability - Slice A

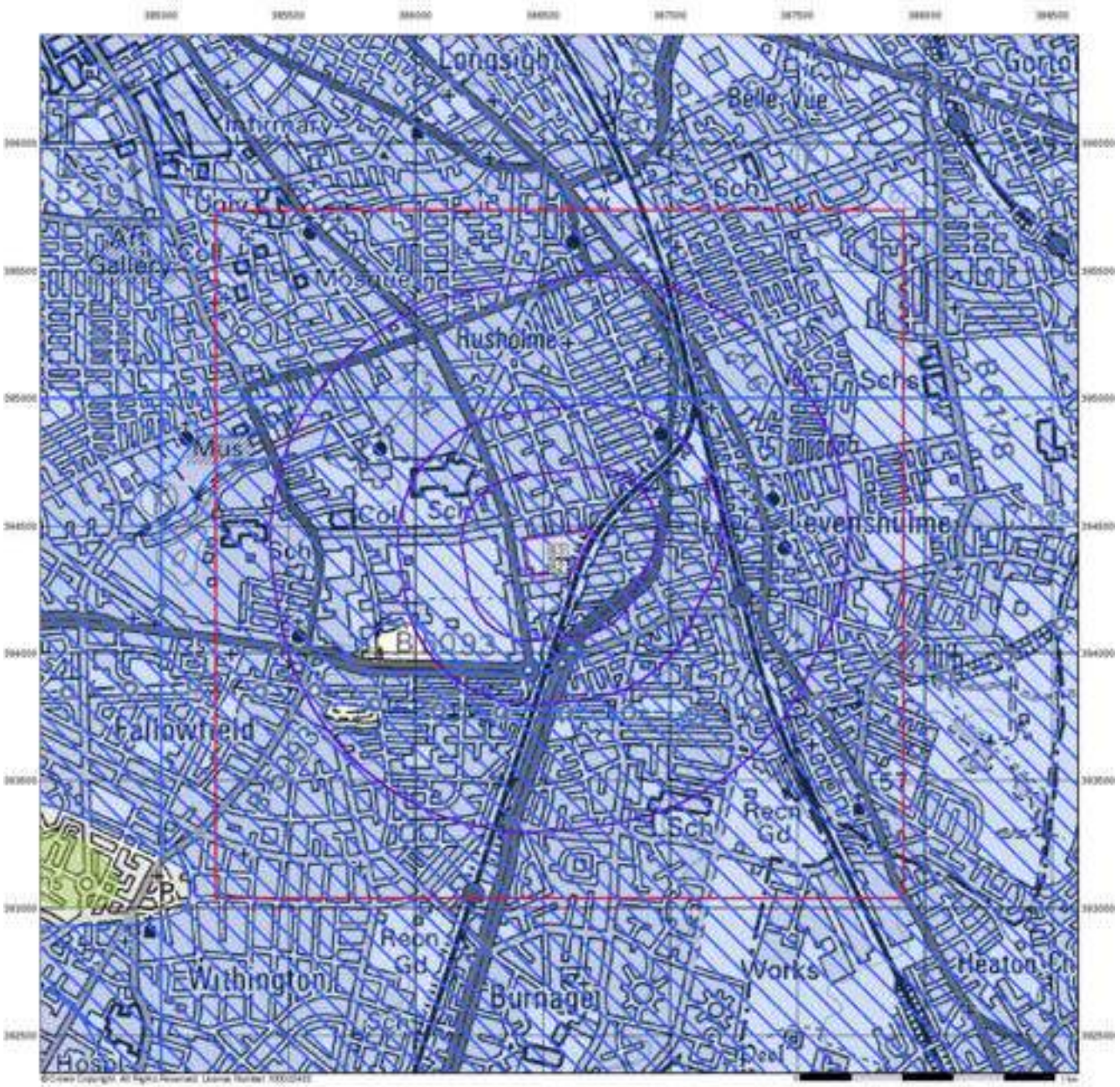
### Order Details

| | |
|---|---|
| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386560, 394400 |
| Slice: | A |
| Site Area (Ha): | 3.21 |
| Search Buffer (m): | 1000 |

### Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

Landmark
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk




RAMBOLL ENVIRON

## Ground Stability Data (1:50,000)

**General**

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

**Potential for Running Sand Ground Stability Hazards**

High | Low | Moderate | Very Low

**Potential for Shrinking or Swelling Clay Ground Stability Hazards**

High | Low | Moderate | Very Low

### Mining and Ground Stability - Slice A

### Order Details

| | |
|---|---|
| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386560, 394400 |
| Slice: | A |
| Site Area (Ha): | 3.21 |
| Search Buffer (m): | 1000 |

### Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

Landmark
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

# Envirocheck® Report:

# Mining and Ground Stability Datasheet

## Order Details:

**Order Number:**
80427581_1_1

**Customer Reference:**
16200001457

**National Grid Reference:**
386560, 394400

**Slice:**
A

**Site Area (Ha):**
3.21

**Search Buffer (m):**
1000

## Site Details:

Birchfields Primary School
Lytham Road
MANCHESTER
M14 6PL

## Client Details:

Mr S Miller
Ramboll UK Ltd
2nd Floor
The Exchange
Chester
CH 1 1DA

# Contents


| Report Section and Details | Page Number |
|---|---|
| **Summary** | - |
| The Summary section provides an overview of the data contained within the report, detailing the number of data set features or the existence of a data set in relation to the buffer selected.<br>For ease of reference, the report is broken down into 4 sections of data; Mining and Natural Cavities Data, Historical Land Use Information (1:2,500), Historical Land Use Information (1:10,000) and Ground Stability Data (1:50,000). | |
| **Mining and Natural Cavities Data** | 1 |
| The Mining and Natural Cavities Data section features data sets related to the existence of mining areas and their potential hazards; and details of naturally formed cavities.<br>Data sets within this section are not plotted, with the exception of BGS Recorded Mineral Sites and Potential Mining Areas which feature on the Historical Land Use Information (1:10,000) map. | |
| **Historical Land Use Information (1:2,500)** | 2 |
| The Historical Land Use Information (1:2,500) section contains data captured from analysis carried out by Landmark of 1:1,250 and 1:2,500 scale historical Ordnance Survey mapping, identifying areas where, historically, the land uses were potentially contaminative.<br>For the purpose of this Envirocheck module, only historical data relating to mining and ground stability has been included and plotted on the corresponding Historical Land Use Information (1:2,500) map. This section also includes the Subterranean Features data set, which details various man-made and man-used underground spaces obtained from the Subterranea Britannica society. | |
| **Historical Land Use Information (1:10,000)** | 3 |
| The Historical Land Use (1:10,000) section covers data captured from the systematic analysis carried out by Landmark of 1:10, 560 and 1:10,000 scale historical Ordnance Survey mapping dating back to the mid-19th century, identifying potentially contaminative past industrial land uses.<br>For the purpose of this Envirocheck module, only data relating to mining and ground stability has been included and plotted on the accompanying Historical Land Use Information (1:10,000) map. | |
| **Ground Stability Data (1:50,000)** | 7 |
| The Ground Stability (1:50,000) section includes the BGS Geosure data suite, reporting features to 250m and plotted onto 3 separate maps. Also reported is brine subsidence, brine mining and salt mining data sets, of which Brine Pumping and Salt Mining Related Features are plotted, and subsidence insurance claims and insurance investigations data, which is not plotted. | |
| **Motion Map Data (1:2,500)** | 8 |
| The Motion Map Data (1:2,500) section contains data which is plotted to indicate long-term stability trends from analysis of satellite radar data. | |
| **Historical Map List** | 11 |
| The Historical Map List section details the historical mapping that has been analysed for your site, in relation to the Historical Land Use Information sections. | |
| **Data Currency** | 12 |
| **Data Suppliers** | 14 |
| **Useful Contacts** | 15 |



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The brine subsidence data relating to the Driotwich area as provided in this report is derived from JPB studies and physical monitoring undertaken annually over more than 35 years. For more detailed interpretation contact enquiries@jpb.co.uk. JPB retain the copyright and intellectual rights to this data and accept no liability for any loss or damage, including in direct or consequential loss, arising from the use of this data.

# Contents

**Report Version v50.0**

RAMBOLL ENVIRON

# Summary

| Data Type | Page Number | On Site | 0 to 250m | 251 to 500m | 501 to 1000m |
|---|---|---|---|---|---|
| **Mining and Natural Cavities Data** | | | | | |
| BGS Recorded Mineral Sites | | | | | |
| Coal Mining Affected Areas | | | n/a | n/a | n/a |
| Man Made Mining Cavities | | | | | |
| Mining Instability | | | n/a | n/a | n/a |
| Natural Cavities | | | | | |
| Non Coal Mining Areas of Great Britain | pg 1 | Yes | | n/a | n/a |
| Potential Mining Areas | | | | | |
| **Historical Land Use Information (1:2,500)** | | | | | |
| Extractive Industries or Potential Excavations from 1855-1909 (100m) | | | | n/a | n/a |
| Extractive Industries or Potential Excavations from 1893-1915 (100m) | | | | n/a | n/a |
| Extractive Industries or Potential Excavations from 1906-1937 (100m) | | | | n/a | n/a |
| Extractive Industries or Potential Excavations from 1924-1949 (100m) | | | | n/a | n/a |
| Extractive Industries or Potential Excavations from 1950-1980 (100m) | pg 2 | 1 | | n/a | n/a |
| Subterranean Features (100m) | | | | n/a | n/a |
| **Historical Land Use Information (1:10,000)** | | | | | |
| Air Shafts | | | | | |
| Disturbed Ground | pg 3 | | | | 2 |
| General Quarrying | | | | | |
| Heap, unknown constituents | | | | | |
| Mineral Railway | | | | | |
| Mining & quarrying general | | | | | |
| Mining of coal & lignite | | | | | |
| Quarrying of sand & clay, operation of sand & gravel pits | | | | | |
| Former Marshes | | | | | |
| Potentially Infilled Land (Non-Water) | pg 3 | | | | 1 |
| Potentially Infilled Land (Water) | pg 3 | | 9 | 18 | 48 |

# Summary

| Data Type | Page Number | On Site | 0 to 250m | 251 to 500m | 501 to 1000m |
|---|---|---|---|---|---|
| **Ground Stability Data (1:50,000)** | | | | | |
| Brine Compensation Area | | | n/a | n/a | n/a |
| Brine Pumping Related Features | | | | | |
| Brine Subsidence Solution Area | | | | | |
| Potential for Collapsible Ground Stability Hazards | pg 7 | Yes | | n/a | n/a |
| Potential for Compressible Ground Stability Hazards | pg 7 | Yes | | n/a | n/a |
| Potential for Ground Dissolution Stability Hazards | pg 7 | Yes | | n/a | n/a |
| Potential for Landslide Ground Stability Hazards | pg 7 | Yes | | n/a | n/a |
| Potential for Running Sand Ground Stability Hazards | pg 7 | Yes | | n/a | n/a |
| Potential for Shrinking or Swelling Clay Ground Stability Hazards | pg 7 | Yes | | n/a | n/a |
| Salt Mining Related Features | | | | | |
| Subsidence Insurance Claims | | | | n/a | n/a |
| Subsidence Investigations | pg 7 | | 1 | n/a | n/a |
| **Motion Map Data (1:2,500)** | | | | | |
| Motion Map (100m) | pg 8 | 1 | 44 | n/a | n/a |

**Report Version v50.0**

# Mining and Natural Cavities Data

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Coal Mining Affected Areas**<br>In an area which may not be affected by coal mining | | | | |
| | **Non Coal Mining Areas of Great Britain**<br>Risk: Rare<br>Source: British Geological Survey, National Geoscience Information Service | A13NE (NE) | 0 | 2 | 386623 394441 |

# Historical Land Use Information (1:2,500)

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 1 | **Extractive Industries or Potential Excavations from 1950-1980**<br>Use: Railway Embankment<br>First Map Published Date: 1957<br>Last Map Published Date: 1958 | A13SE (SE) | 0 | - | 386641 394365 |

# Historical Land Use Information (1:10,000)

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 2 | **Disturbed Ground**<br>Use: Not Supplied<br>Date of Mapping: 1895 | A18NE (N) | 844 | - | 386579 395313 |
| 3 | **Disturbed Ground**<br>Use: Not Supplied<br>Date of Mapping: 1895 | A23SE (N) | 943 | - | 386785 395418 |
| 4 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A19NW (NE) | 988 | - | 387226 395315 |
| 5 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13SW (SW) | 19 | - | 386445 394283 |
| 6 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13NE (N) | 21 | - | 386584 394484 |
| 7 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1894 | A13NE (E) | 36 | - | 386713 394431 |
| 8 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A13NW (W) | 103 | - | 386334 394395 |
| 9 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1908 | A13NE (E) | 120 | - | 386817 394454 |
| 10 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A13SE (SE) | 136 | - | 386723 394226 |
| 11 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13SW (SW) | 143 | - | 386334 394223 |
| 12 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A13SE (S) | 176 | - | 386643 394146 |
| 13 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A13NW (NW) | 193 | - | 386257 394527 |
| 14 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13SE (S) | 260 | - | 386614 394057 |
| 15 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1908 | A18SE (NE) | 267 | - | 386783 394733 |
| 16 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14SW (E) | 273 | - | 386916 394307 |
| 17 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1894 | A18SW (N) | 281 | - | 386541 394741 |
| 18 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A18SW (NW) | 293 | - | 386403 394735 |
| 19 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A12NE (W) | 293 | - | 386142 394492 |
| 20 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A13NE (NE) | 305 | - | 386890 394717 |
| 21 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1908 | A12SE (W) | 310 | - | 386148 394255 |
| 22 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14SW (E) | 345 | - | 387025 394364 |

# Historical Land Use Information (1:10,000)

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 23 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1908 | A18SE (N) | 354 | - | 386655 394830 |
| 24 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A17SE (NW) | 366 | - | 386212 394737 |
| 25 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1894 | A18SE (N) | 405 | - | 386577 394871 |
| 26 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1908 | A14SW (E) | 410 | - | 387096 394377 |
| 27 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1908 | A8NE (SE) | 410 | - | 386804 393952 |
| 28 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1894 | A18SE (N) | 423 | - | 386708 394901 |
| 29 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14NW (E) | 460 | - | 387144 394596 |
| 30 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A18SW (N) | 464 | - | 386409 394907 |
| 31 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1908 | A19SW (NE) | 480 | - | 387063 394791 |
| 32 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8NW (SW) | 513 | - | 386293 393812 |
| 33 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A18NE (N) | 577 | - | 386664 395067 |
| 34 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14NE (E) | 599 | - | 387277 394638 |
| 35 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9NW (SE) | 610 | - | 387005 393843 |
| 36 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14NE (E) | 641 | - | 387338 394424 |
| 37 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8SE (S) | 642 | - | 386683 393681 |
| 38 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A8SW (S) | 649 | - | 386478 393648 |
| 39 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7NE (SW) | 653 | - | 386018 393813 |
| 40 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1894 | A8SW (S) | 669 | - | 386438 393630 |
| 41 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A18NW (N) | 671 | - | 386417 395117 |
| 42 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A8SE (S) | 674 | - | 386818 393674 |
| 43 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1894 | A9NW (SE) | 681 | - | 387146 393882 |

# Historical Land Use Information (1:10,000)

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 44 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A17SE (NW) | 692 | - | 385903 394890 |
| 45 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A18NW (N) | 692 | - | 386450 395143 |
| 46 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A8SW (SW) | 694 | - | 386233 393641 |
| 47 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A19NW (NE) | 714 | - | 386917 395159 |
| 48 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A18NW (N) | 729 | - | 386482 395185 |
| 49 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A17NE (NW) | 729 | - | 386057 395069 |
| 50 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A17NE (NW) | 731 | - | 386111 395100 |
| 51 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14SE (E) | 731 | - | 387394 394253 |
| 52 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A19NW (NE) | 749 | - | 386950 395184 |
| 53 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A18NW (N) | 757 | - | 386539 395221 |
| 54 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A18NE (N) | 765 | - | 386689 395243 |
| 55 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12NW (W) | 768 | - | 385696 394669 |
| 56 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A19NW (NE) | 773 | - | 387121 395126 |
| 57 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A17SW (NW) | 807 | - | 385692 394769 |
| 58 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A8SW (S) | 807 | - | 386436 393491 |
| 59 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1908 | A8SW (S) | 820 | - | 386321 393490 |
| 60 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1894 | A7SE (SW) | 828 | - | 386058 393571 |
| 61 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A18NW (N) | 836 | - | 386351 395275 |
| 62 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1894 | A14NE (E) | 847 | - | 387544 394533 |
| 63 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9SW (SE) | 864 | - | 387047 393566 |
| 64 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A15NW (E) | 883 | - | 387578 394392 |

# Historical Land Use Information (1:10,000)

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 65 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1894 | A7NW (SW) | 888 | - | 385787 393714 |
| 66 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1894 | A14SE (E) | 905 | - | 387555 394184 |
| 67 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1894 | A15NW (E) | 911 | - | 387587 394684 |
| 68 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1894 | A19SE (E) | 911 | - | 387568 394753 |
| 69 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A19NW (NE) | 916 | - | 387177 395260 |
| 70 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A11NE (W) | 917 | - | 385534 394634 |
| 71 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A9SW (SE) | 919 | - | 387213 393615 |
| 72 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A15NW (E) | 919 | - | 387616 394416 |
| 73 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A19SE (NE) | 926 | - | 387502 394940 |
| 74 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A19NE (NE) | 956 | - | 387380 395150 |
| 75 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7NW (SW) | 956 | - | 385687 393728 |
| 76 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7SW (SW) | 958 | - | 385716 393689 |
| 77 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1894 | A15SW (E) | 979 | - | 387671 394357 |
| 78 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1908 | A9SE (SE) | 979 | - | 387384 393702 |
| 79 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7SW (SW) | 984 | - | 385855 393519 |

# Ground Stability Data (1:50,000)

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Brine Compensation Area**<br>The site does not fall within the brine compensation area. | | | | |
| | **Brine Subsidence Solution Area**<br>The site does not fall within the brine subsidence solution area. | | | | |
| 80 | **Potential for Collapsible Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 0 | 2 | 386559 394399 |
| | **Potential for Compressible Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 0 | 2 | 386559 394399 |
| | **Potential for Ground Dissolution Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 0 | 2 | 386559 394399 |
| 81 | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 0 | 2 | 386559 394399 |
| 82 | **Potential for Running Sand Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 0 | 2 | 386559 394399 |
| 83 | **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 0 | 2 | 386559 394399 |
| | **Subsidence Investigations**<br>Site Investigation Date: 5th December 2005<br>Root Survey: No<br>CCTV Drain Survey: No<br>Depth of Foundation Footing: Not Supplied<br>Soil Classification: Not Supplied | | | - | |

# Motion Map Data (1:2,500)

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 84 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.3 | A13SE (SE) | 0 | - | 386607 394344 |
| 85 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.0 | A13NE (NE) | 11 | - | 386623 394479 |
| 86 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.3 | A13SE (SE) | 16 | - | 386640 394316 |
| 86 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.4 | A13SE (SE) | 19 | - | 386644 394319 |
| 87 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.2 | A13NW (NW) | 21 | - | 386483 394471 |
| 88 | **Motion Map**<br>Average Velocity Gradient (mmyear): -1.0 | A13NE (NE) | 21 | - | 386640 394492 |
| 88 | **Motion Map**<br>Average Velocity Gradient (mmyear): -1.1 | A13NE (NE) | 23 | - | 386647 394494 |
| 88 | **Motion Map**<br>Average Velocity Gradient (mmyear): -1.1 | A13NE (NE) | 24 | - | 386643 394495 |
| 88 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.2 | A13NE (NE) | 27 | - | 386647 394498 |
| 88 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.8 | A13NE (NE) | 28 | - | 386644 394499 |
| 89 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.3 | A13NW (N) | 25 | - | 386551 394484 |
| 89 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.3 | A13NW (N) | 27 | - | 386556 394487 |
| 89 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.3 | A13NW (N) | 29 | - | 386552 394488 |
| 90 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.1 | A13NE (NE) | 28 | - | 386686 394505 |
| 90 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.1 | A13NE (NE) | 33 | - | 386685 394510 |
| 91 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.2 | A13SW (W) | 34 | - | 386407 394379 |
| 92 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.4 | A13SW (W) | 34 | - | 386410 394362 |
| 93 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.5 | A13NW (W) | 37 | - | 386397 394459 |
| 93 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.2 | A13NW (W) | 41 | - | 386393 394459 |
| 94 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.0 | A13SW (SW) | 37 | - | 386416 394311 |

# Motion Map Data (1:2,500)

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 95 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.4 | A13NW (NW) | 37 | - | 386507 394490 |
| 95 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.6 | A13NW (NW) | 38 | - | 386503 394491 |
| 95 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.5 | A13NW (NW) | 43 | - | 386502 394495 |
| 96 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.6 | A13SW (S) | 45 | - | 386556 394267 |
| 96 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.8 | A13SW (S) | 48 | - | 386554 394263 |
| 96 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.5 | A13SW (S) | 52 | - | 386555 394259 |
| 97 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.1 | A13NE (NE) | 46 | - | 386684 394522 |
| 98 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.4 | A13SW (S) | 56 | - | 386553 394255 |
| 99 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.2 | A13NW (N) | 57 | - | 386541 394515 |
| 99 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.2 | A13NW (N) | 58 | - | 386539 394515 |
| 100 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.6 | A13NW (NW) | 58 | - | 386472 394506 |
| 101 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.2 | A13NE (N) | 61 | - | 386586 394525 |
| 102 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.7 | A13SW (S) | 72 | - | 386542 394237 |
| 102 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.4 | A13SW (S) | 73 | - | 386544 394237 |
| 103 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.6 | A13NW (W) | 72 | - | 386358 394447 |
| 103 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.8 | A13NW (W) | 77 | - | 386353 394448 |
| 104 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.1 | A13NE (N) | 73 | - | 386609 394540 |
| 105 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.2 | A13SW (S) | 73 | - | 386499 394231 |
| 105 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.3 | A13SW (S) | 74 | - | 386503 394230 |
| 106 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.2 | A13SW (SW) | 74 | - | 386389 394265 |

# Motion Map Data (1:2,500)

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 107 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.2 | A13SW (SW) | 76 | - | 386473 394225 |
| 108 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.2 | A13SW (W) | 76 | - | 386368 394355 |
| 109 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.3 | A13NE (NE) | 87 | - | 386648 394559 |
| 110 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.1 | A13NW (N) | 89 | - | 386563 394550 |
| 111 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.5 | A13NE (NE) | 91 | - | 386637 394561 |

# Historical Map List

**The following mapping has been analysed for Historical Land Use Information (1:2,500):**

| 1:2,500 | Mapsheet | Published Date |
|---|---|---|
| Lancashire And Furness | 111_03 | 1893 |
| Lancashire And Furness | 111_03 | 1907 |
| Lancashire And Furness | 111_04 | 1907 |
| Lancashire And Furness | 111_03 | 1922 |
| Lancashire And Furness | 111_04 | 1933 |
| Ordnance Survey Plan | SJ8694 | 1957 |

**The following mapping has been analysed for Historical Land Use Information (1:10,000):**

| 1:10,560 | Mapsheet | Published Date |
|---|---|---|
| Lancashire And Furness | 104_00 | 1848 |
| Lancashire And Furness | 111_00 | 1848 |
| Cheshire | 010_00 | 1882 |
| Lancashire And Furness | 111_NE | 1894 |
| Lancashire And Furness | 104_SE | 1895 |
| Lancashire And Furness | 111_NE | 1908 |
| Lancashire And Furness | 104_SE | 1909 |
| Lancashire And Furness | 104_SE | 1923 |
| Lancashire And Furness | 111_NE | 1923 |
| Ordnance Survey Plan | SJ89SE | 1955 |
| Ordnance Survey Plan | SJ89NE | 1956 |
| **1:10,000** | **Mapsheet** | **Published Date** |
| Ordnance Survey Plan | SJ89SE | 1990 |
| Ordnance Survey Plan | SJ89NE | 1993 |

# Data Currency

| Mining and Cavities Data | Version | Update Cycle |
|---|---|---|
| **BGS Recorded Mineral Sites**<br>British Geological Survey - National Geoscience Information Service | November 2015 | Bi-Annually |
| **Coal Mining Affected Areas**<br>The Coal Authority - Property Searches | March 2014 | As notified |
| **Man Made Mining Cavities**<br>Peter Brett Associates | October 2015 | Bi-Annually |
| **Mining Instability**<br>Ove Arup & Partners | October 2000 | Not Applicable |
| **Natural Cavities**<br>Peter Brett Associates | October 2015 | Bi-Annually |
| **Non Coal Mining Areas of Great Britain**<br>British Geological Survey - National Geoscience Information Service | July 2014 | Not Applicable |
| **Historical Land Use Information (1:2,500)** | **Version** | **Update Cycle** |
| **Subterranean Features**<br>Landmark Information Group Limited | August 2015 | Bi-Annually |
| **Ground Stability Data (1:50,000)** | **Version** | **Update Cycle** |
| **Brine Compensation Area**<br>Cheshire Brine Subsidence Compensation Board | August 2011 | Not Applicable |
| **Potential for Collapsible Ground Stability Hazards**<br>British Geological Survey - National Geoscience Information Service | June 2015 | Annually |
| **Potential for Compressible Ground Stability Hazards**<br>British Geological Survey - National Geoscience Information Service | June 2015 | Annually |
| **Potential for Ground Dissolution Stability Hazards**<br>British Geological Survey - National Geoscience Information Service | June 2015 | Annually |
| **Potential for Landslide Ground Stability Hazards**<br>British Geological Survey - National Geoscience Information Service | June 2015 | Annually |
| **Potential for Running Sand Ground Stability Hazards**<br>British Geological Survey - National Geoscience Information Service | June 2015 | Annually |
| **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>British Geological Survey - National Geoscience Information Service | June 2015 | Annually |
| **Subsidence Insurance Claims**<br>SP Property Services | November 2015 | Quarterly |
| **Subsidence Investigations**<br>CET Structures Ltd | November 2015 | Quarterly |

| Motion Map Data (1:2,500) | Version | Update Cycle |
|---|---|---|
| **Motion Map** | | |
| Nigel Press Associates - Hampshire | February 2011 | As notified |
| Nigel Press Associates - Cambridge | January 2011 | As notified |
| Nigel Press Associates - Ipswich | January 2011 | As notified |
| Nigel Press Associates - Norwich | January 2011 | As notified |
| Nigel Press Associates - Peterborough | January 2011 | As notified |
| Nigel Press Associates - Barnstaple | July 2010 | As notified |
| Nigel Press Associates - Derbyshire | July 2010 | As notified |
| Nigel Press Associates - Humberside | July 2010 | As notified |
| Nigel Press Associates - Kent | July 2010 | As notified |
| Nigel Press Associates - Lincolnshire | July 2010 | As notified |
| Nigel Press Associates - Nottinghamshire | July 2010 | As notified |
| Nigel Press Associates - Birmingham | May 2009 | As notified |
| Nigel Press Associates - Bournemouth | May 2009 | As notified |
| Nigel Press Associates - Brighton | May 2009 | As notified |
| Nigel Press Associates - Bristol | May 2009 | As notified |
| Nigel Press Associates - Cardiff | May 2009 | As notified |
| Nigel Press Associates - Central London | May 2009 | As notified |
| Nigel Press Associates - Cheltenahm | May 2009 | As notified |
| Nigel Press Associates - Coventry | May 2009 | As notified |
| Nigel Press Associates - Crawley | May 2009 | As notified |
| Nigel Press Associates - Edinburgh | May 2009 | As notified |
| Nigel Press Associates - Exeter | May 2009 | As notified |
| Nigel Press Associates - Glasgow | May 2009 | As notified |
| Nigel Press Associates - Isle of Wight | May 2009 | As notified |
| Nigel Press Associates - Leeds | May 2009 | As notified |
| Nigel Press Associates - Leicester | May 2009 | As notified |
| Nigel Press Associates - Liverpool | May 2009 | As notified |
| Nigel Press Associates - Manchester | May 2009 | As notified |
| Nigel Press Associates - Milton Keynes | May 2009 | As notified |
| Nigel Press Associates - Newcastle | May 2009 | As notified |
| Nigel Press Associates - Northwich | May 2009 | As notified |
| Nigel Press Associates - Nottingham | May 2009 | As notified |
| Nigel Press Associates - Oxford | May 2009 | As notified |
| Nigel Press Associates - Plymouth | May 2009 | As notified |
| Nigel Press Associates - Portsmouth | May 2009 | As notified |
| Nigel Press Associates - Preston | May 2009 | As notified |
| Nigel Press Associates - Reading | May 2009 | As notified |
| Nigel Press Associates - Sheffield | May 2009 | As notified |
| Nigel Press Associates - Stoke | May 2009 | As notified |
| Nigel Press Associates - Swindon | May 2009 | As notified |
| Nigel Press Associates - Tonbridge | May 2009 | As notified |
| Nigel Press Associates - North London | November 2008 | As notified |
| Nigel Press Associates - Head Office | September 2008 | As notified |

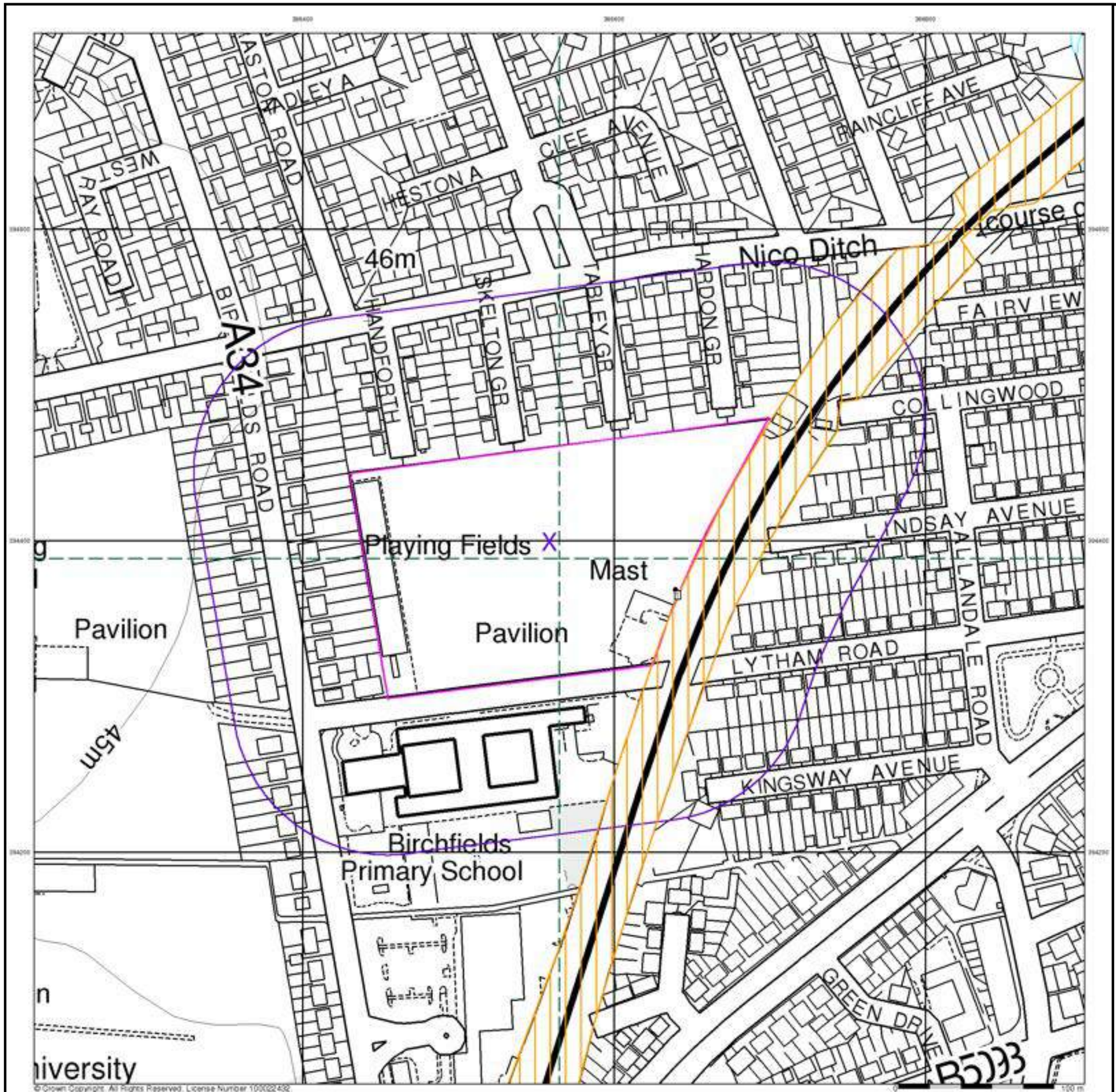
# Data Suppliers

A selection of organisations who provide data within this report

| Data Supplier | Data Supplier Logo |
|---|---|
| **Ordnance Survey** | |
| **British Geological Survey** | |
| **The Coal Authority** | |
| **Ove Arup** | |
| **Peter Brett Associates** | |
| **Wardell Armstrong** | |
| **Johnson Poole & Bloomer** | |

# Useful Contacts

| Contact | Name and Address | Contact Details |
|---|---|---|
| 1 | **The Coal Authority - Property Searches**<br>200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG | Telephone: 0345 762 6848<br>Fax: 01623 637 338<br>Email: groundstability@coal.gov.uk |
| 2 | **British Geological Survey - Enquiry Service**<br>British Geological Survey, Kingsley Dunham Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG | Telephone: 0115 936 3143<br>Fax: 0115 936 3276<br>Email: enquiries@bgs.ac.uk<br>Website: www.bgs.ac.uk |
| - | **Landmark Information Group Limited**<br>Imperium, Imperial Way, Reading, Berkshire, RG2 0TD | Telephone: 0844 844 9952<br>Fax: 0844 844 9951<br>Email: customerservices@landmarkinfo.co.uk<br>Website: www.landmarkinfo.co.uk |




RAMBOLL ENVIRON

# Historical Land Use Information (1:2,500)

## General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Map ID

Several of Type at Location

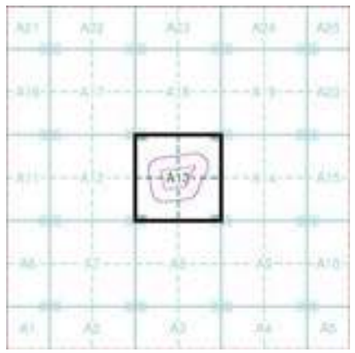
## Potentially Contaminative Industrial Uses (Extractive Industries Activity)

| | Point | Line | Polygon |
|---|---|---|---|
| Extractive Industries Activity from 1855 - 1909 | ▲ | — | ▭ |
| Extractive Industries Activity from 1893 - 1915 | ▲ | — | ▨ |
| Extractive Industries Activity from 1906 - 1937 | ▲ | — | ▦ |
| Extractive Industries Activity from 1924 - 1949 | ▲ | — | ▨ |
| Extractive Industries Activity from 1950 - 1980 | ▲ | — | ▥ |

## Subterranean Features

| | Point | Line | Polygon |
|---|---|---|---|
| Subterranean Features | ▼ | - - - | ▭ |

## Mining and Ground Stability - Segment A13




## Order Details

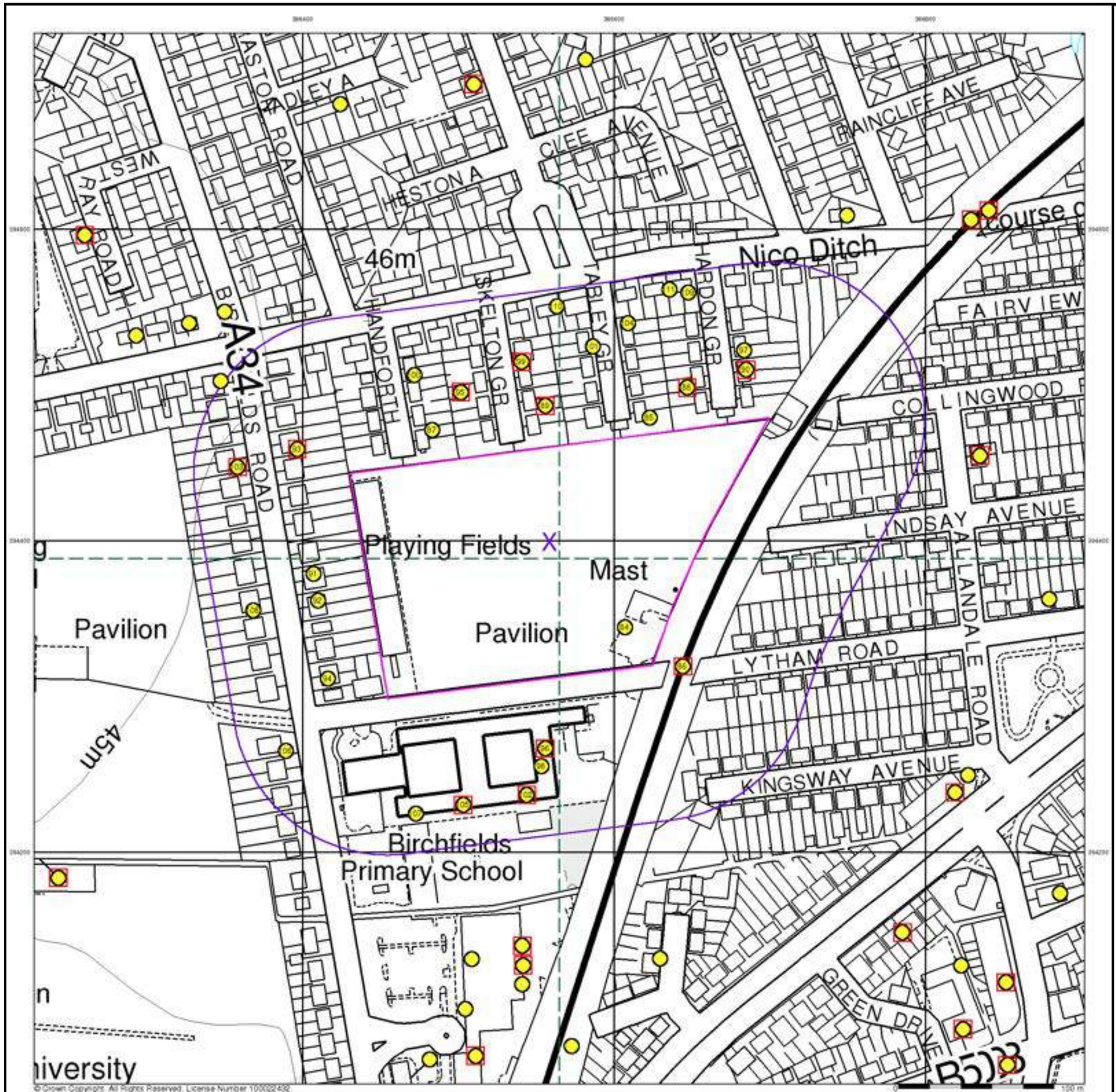
| | |
|---|---|
| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386560, 394400 |
| Slice: | A |
| Site Area (Ha): | 3.21 |
| Plot Buffer (m): | 100 |

## Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

Landmark Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk




RAMBOLL ENVIRON

## Motion Map Data (1:2,500)

### General

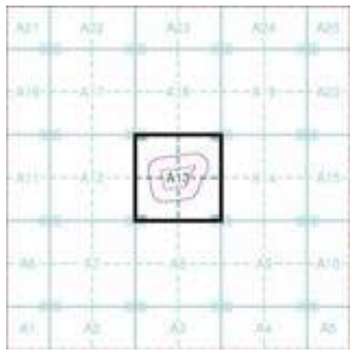
Specified Site | Specified Buffer(s) | Bearing Reference Point | Map ID

Several of Type at Location

### Average Velocity Gradient

| | |
|---|---|
| Upward Movement > 3.5mm per year | |
| Upward Movement 1.5mm to 3.5mm per year | |
| Stable 1.5mm to -1.5mm per year | |
| Downward Movement -1.5mm to -3.5mm per year | |
| Downward Movement > -3.5mm per year | |

### Mining and Ground Stability - Segment A13



### Order Details

| | |
|---|---|
| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386560, 394400 |
| Slice: | A |
| Site Area (Ha): | 3.21 |
| Plot Buffer (m): | 100 |

### Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

Landmark Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

# Geology 1:50,000 Maps Legends

## Artificial Ground and Landslip

| Map Colour | Lex Code | Rock Name | Rock Type | Min and Max Age |
|---|---|---|---|---|
| | WMGR | Infilled Ground | Artificial Deposit | Cenozoic - Cenozoic |
| | MGR | Made Ground (Undivided) | Artificial Deposit | Holocene - Holocene |

## Superficial Geology

| Map Colour | Lex Code | Rock Name | Rock Type | Min and Max Age |
|---|---|---|---|---|
| | TILLD | Till, Devensian | Diamicton | Devensian - Devensian |
| | GFICD | Glaciofluvial Ice Contact Deposits, Devensian | Sand and Gravel | Devensian - Devensian |
| | SSA | Shirdley Hill Sand Formation | Sand | Flandrian - Devensian |
| | GFSDD | Glaciofluvial Sheet Deposits, Devensian | Sand and Gravel | Devensian - Devensian |

## Bedrock and Faults

| Map Colour | Lex Code | Rock Name | Rock Type | Min and Max Age |
|---|---|---|---|---|
| | CPB | Chester Pebble Beds Formation | Sandstone | Early Triassic - Early Triassic |
| | CPB | Chester Pebble Beds Formation | Sandstone, Pebbly (Gravelly) | Early Triassic - Early Triassic |
| | WLSF | Wilmslow Sandstone Formation | Sandstone | Early Triassic - Early Triassic |
| | MM | Manchester Marls Formation | Mudstone | Late Permian - Late Permian |
| | CS | Collyhurst Sandstone Formation | Sandstone | Cisuralian - Cisuralian |
| | HA | Halesowen Formation | Mudstone, Siltstone and Sandstone | Westphalian D - Westphalian D |
| | GML | Great Mine Limestone | Limestone | Westphalian D - Westphalian D |
| | ETM | Etruria Formation | Sandstone and Mudstone | Westphalian - Westphalian |
| | ETM | Etruria Formation | Mudstone, Sandstone and Conglomerate | Westphalian - Westphalian |
| | | Faults | | |

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## Geology 1:50,000 Maps

This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published paper maps.
The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page. Not all layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

## Geology 1:50,000 Maps Coverage

| | | | |
|---|---|---|---|
| **Map ID:** | **2** | **Map ID:** | **1** |
| **Map Sheet No:** | **098** | **Map Sheet No:** | **085** |
| **Map Name:** | **Stockport** | **Map Name:** | **Manchester** |
| **Map Date:** | **1977** | **Map Date:** | **2011** |
| **Bedrock Geology:** | **Available** | **Bedrock Geology:** | **Available** |
| **Superficial Geology:** | **Available** | **Superficial Geology:** | **Available** |
| **Artificial Geology:** | **Not Available** | **Artificial Geology:** | **Available** |
| **Faults:** | **Not Supplied** | **Faults:** | **Not Supplied** |
| **Landslip:** | **Available** | **Landslip:** | **Available** |
| **Rock Segments:** | **Not Supplied** | **Rock Segments:** | **Not Supplied** |

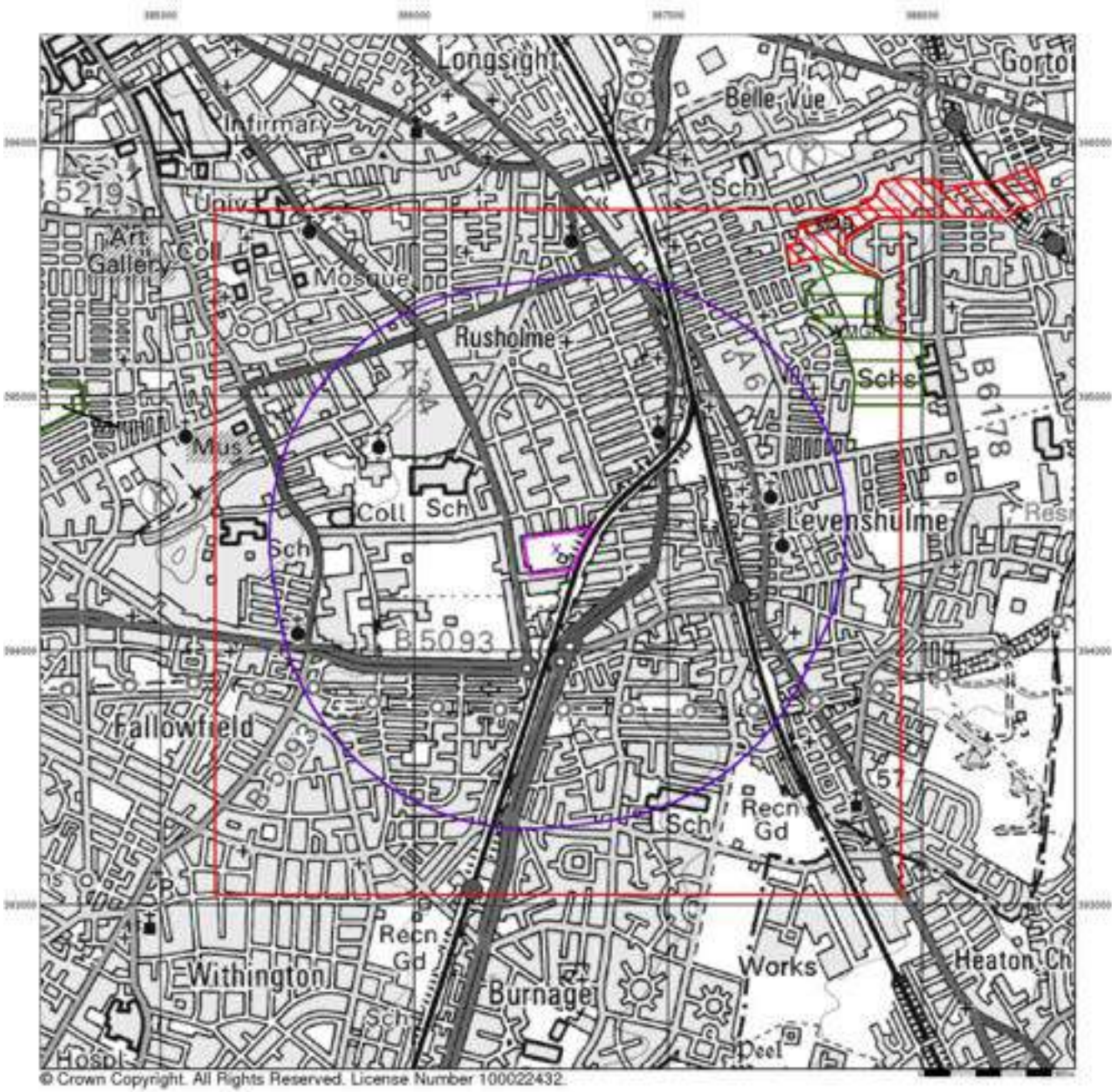
## Geology 1:50,000 Maps - Slice A

## Order Details:

Order Number: 80427581_1_1
Customer Reference: 16200001457
National Grid Reference: 386560, 394400
Slice: A
Site Area (Ha): 3.21
Search Buffer (m): 1000

## Site Details:

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

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## Artificial Ground and Landslip

Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground - man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground - areas where the ground has been cut away such as quarries and road cuttings.
- Infilled ground - areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground - areas where the surface has been reshaped.
- Disturbed ground - areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes foundered strata, where the ground has collapsed due to subsidence.

## Artificial Ground and Landslip Map - Slice A

## Order Details:

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| Slice: | A |
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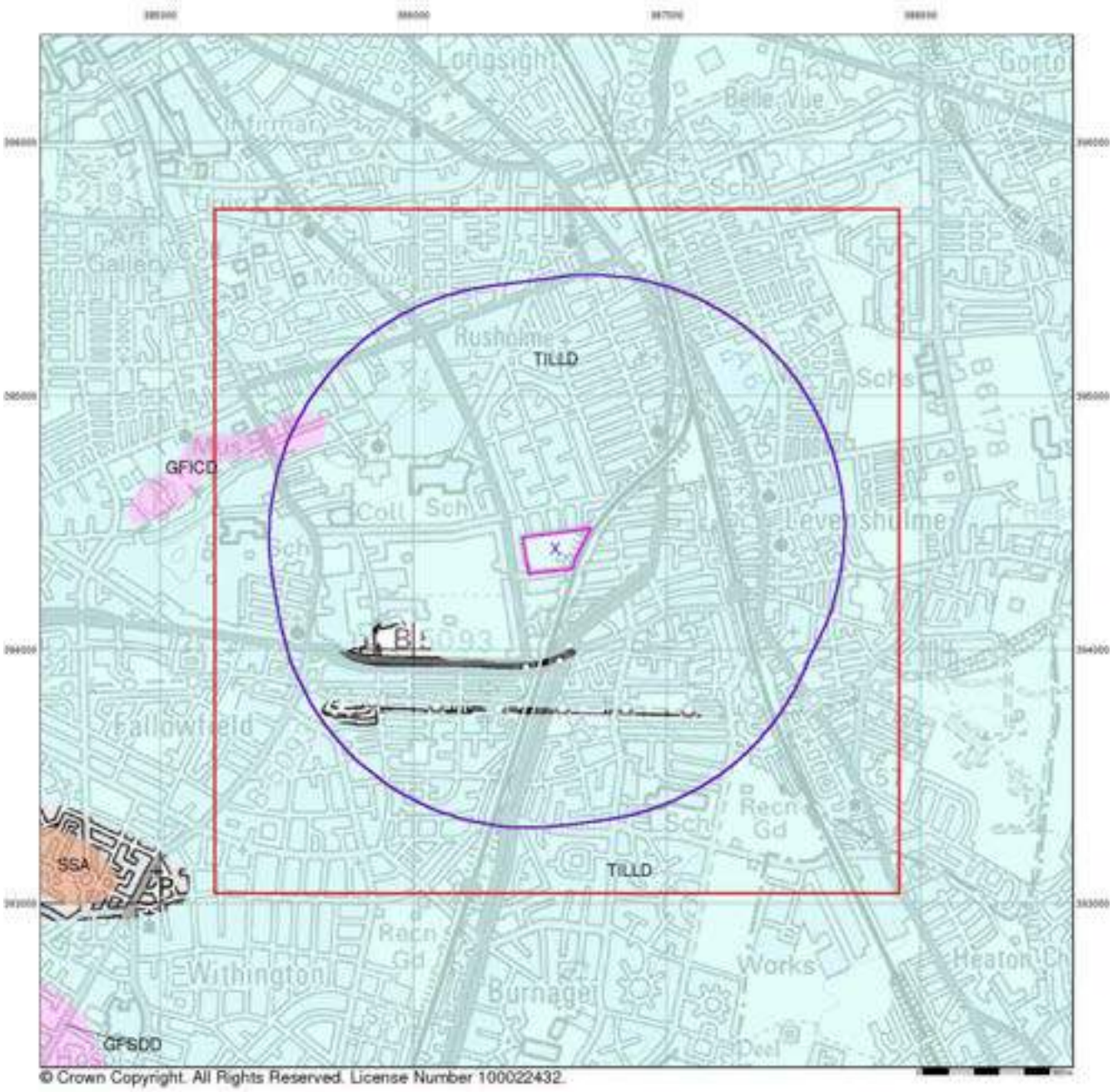
Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

Landmark
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

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## Superficial Geology

Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

## Superficial Geology Map - Slice A

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| | |
|---|---|
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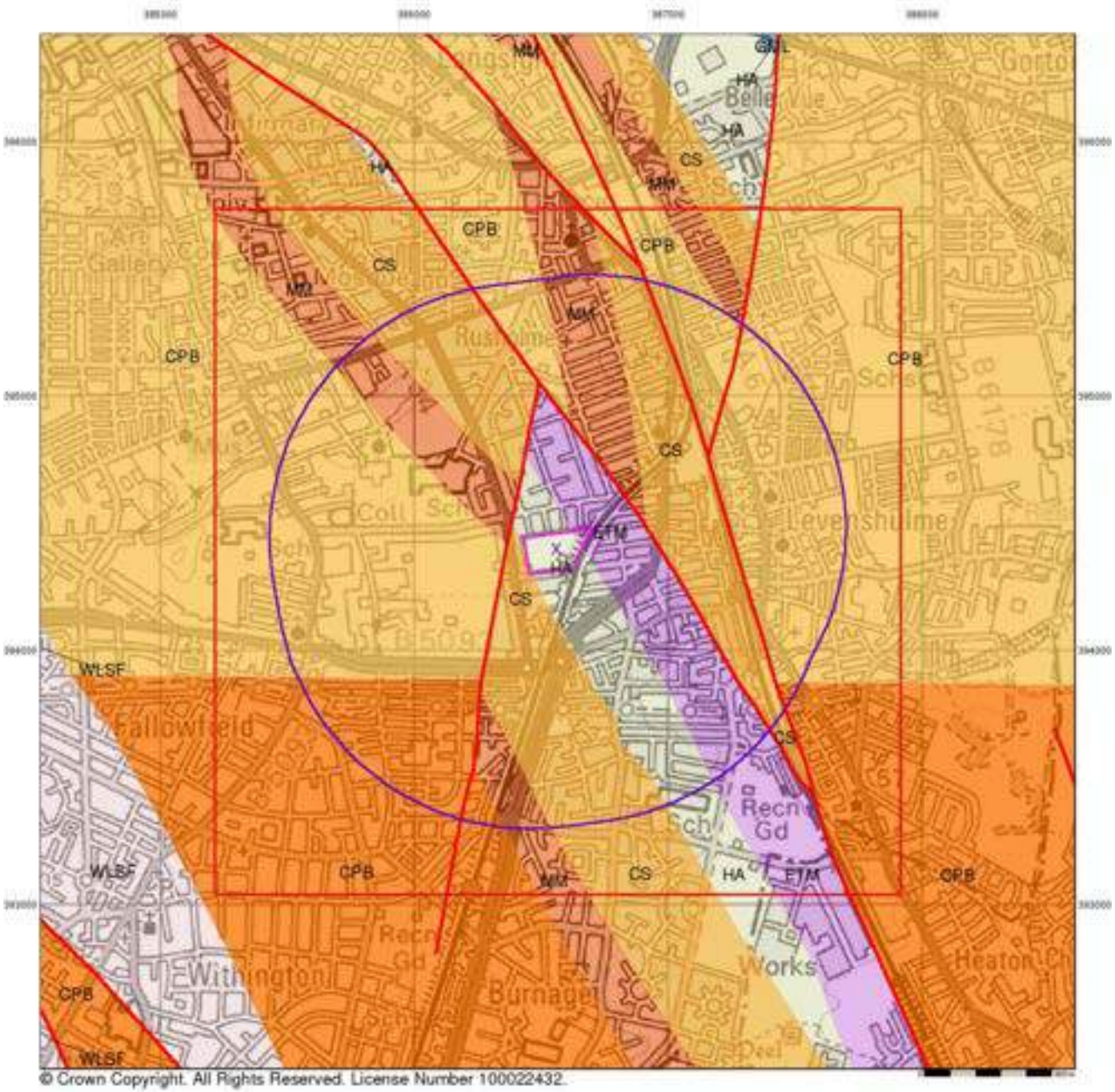

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## Bedrock and Faults

Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults (e.g. normal, thrust), and thin beds mapped as lines (e.g. coal seam, gypsum bed). Some of these are linked to other particular 1:50,000 Geology datasets, for example, coal seams are part of the bedrock sequence, most faults and mineral veins primarily affect the bedrock but cut across the strata and post date its deposition.

## Bedrock and Faults Map - Slice A

## Order Details:

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|---|---|
| Order Number: | 80427581_1_1 |
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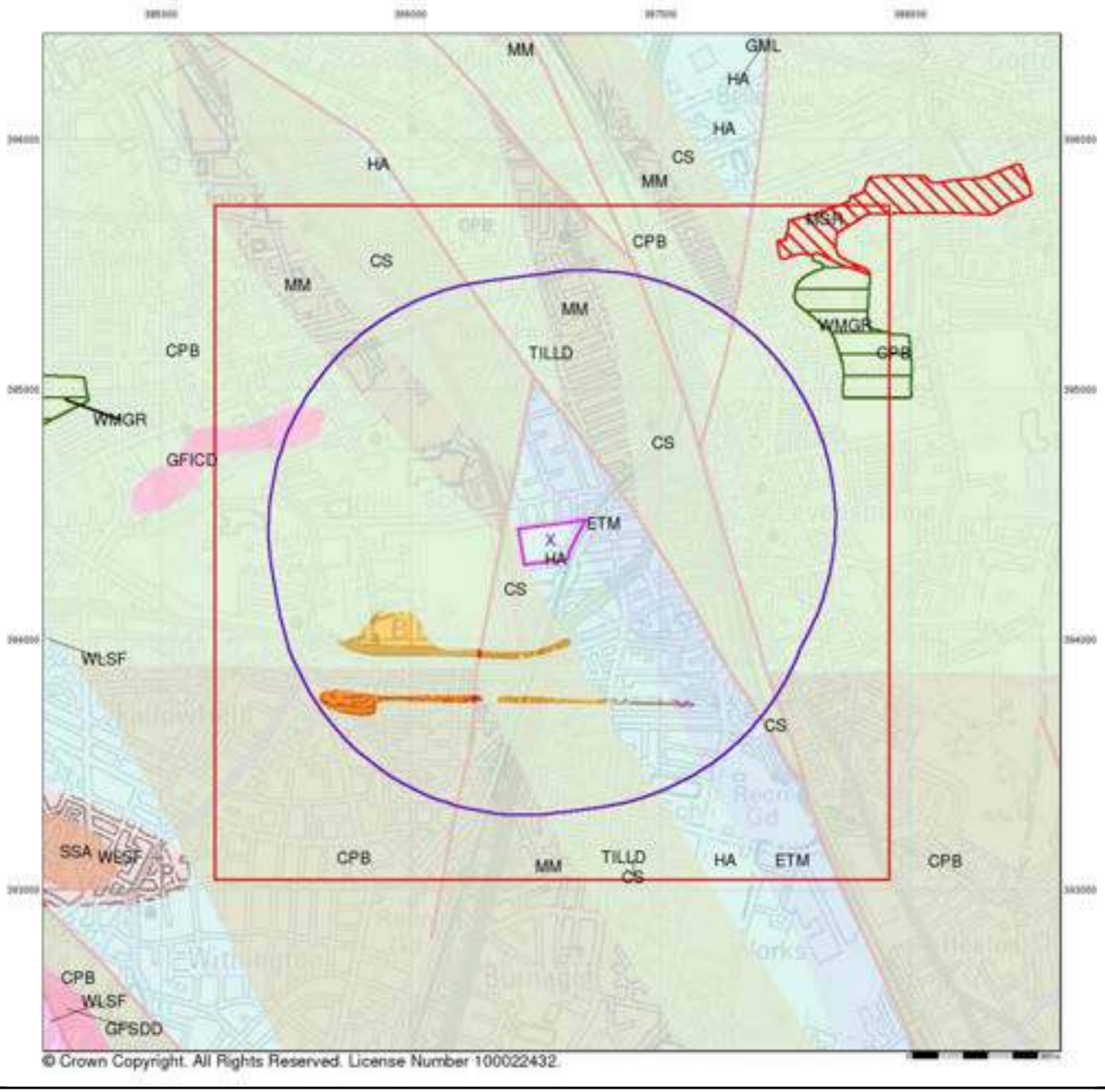


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## Combined Surface Geology

The Combined Surface Geology map combines all the previous maps into one combined geological overview of your site.

Please consult the legends to the previous maps to interpret the Combined "Surface Geology" map.

## Additional Information

More information on 1:50,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

## Contact

British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Telephone: 0115 936 3143
Fax: 0115 936 3276
email: enquiries@bgs.ac.uk
website: www.bgs.ac.uk

## Combined Geology Map - Slice A

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# Historical Mapping Legends

## Ordnance Survey County Series 1:10,560

## Ordnance Survey Plan 1:10,000

## 1:10,000 Raster Mapping

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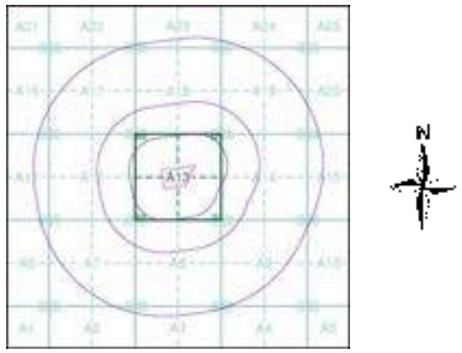
## Historical Mapping & Photography included:

| Mapping Type | Scale | Date | Pg |
|---|---|---|---|
| Lancashire And Furness | 1:10,560 | 1848 | 3 |
| Cheshire | 1:10,560 | 1882 | 4 |
| Lancashire And Furness | 1:10,560 | 1894 | 5 |
| Lancashire And Furness | 1:10,560 | 1908 - 1909 | 6 |
| Lancashire And Furness | 1:10,560 | 1923 | 7 |
| Lancashire And Furness | 1:10,560 | 1933 - 1934 | 8 |
| Lancashire And Furness | 1:10,560 | 1938 | 9 |
| Ordnance Survey Plan | 1:10,000 | 1955 - 1956 | 10 |
| Ordnance Survey Plan | 1:10,000 | 1965 - 1968 | 11 |
| Manchester | 1:25,000 | 1975 | 12 |
| Ordnance Survey Plan | 1:10,000 | 1976 | 13 |
| Ordnance Survey Plan | 1:10,000 | 1981 - 1985 | 14 |
| Ordnance Survey Plan | 1:10,000 | 1987 | 15 |
| Ordnance Survey Plan | 1:10,000 | 1990 - 1993 | 16 |
| 10K Raster Mapping | 1:10,000 | 2006 | 17 |
| VectorMap Local | 1:10,000 | 2016 | 18 |

## Historical Map - Slice A

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Search Buffer (m): 1000

## Site Details

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Landmark Information Group

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Fax: 0844 844 9951
Web: www.envirocheck.co.uk

# Russian Military Mapping Legends

## 1:5,000 and 1:10,000 mapping

[redacted]

## 1:25,000 mapping

[redacted]

## Key to Numbers on Mapping

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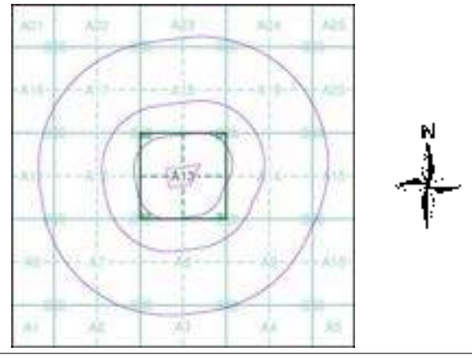
## Historical Mapping & Photography included:

| Mapping Type | Scale | Date | Pg |
|---|---|---|---|
| Lancashire And Furness | 1:10,560 | 1848 | 3 |
| Cheshire | 1:10,560 | 1882 | 4 |
| Lancashire And Furness | 1:10,560 | 1894 | 5 |
| Lancashire And Furness | 1:10,560 | 1908 - 1909 | 6 |
| Lancashire And Furness | 1:10,560 | 1923 | 7 |
| Lancashire And Furness | 1:10,560 | 1933 - 1934 | 8 |
| Lancashire And Furness | 1:10,560 | 1938 | 9 |
| Ordnance Survey Plan | 1:10,000 | 1955 - 1956 | 10 |
| Ordnance Survey Plan | 1:10,000 | 1965 - 1968 | 11 |
| Manchester | 1:25,000 | 1975 | 12 |
| Ordnance Survey Plan | 1:10,000 | 1976 | 13 |
| Ordnance Survey Plan | 1:10,000 | 1981 - 1985 | 14 |
| Ordnance Survey Plan | 1:10,000 | 1987 | 15 |
| Ordnance Survey Plan | 1:10,000 | 1990 - 1993 | 16 |
| 10K Raster Mapping | 1:10,000 | 2006 | 17 |
| VectorMap Local | 1:10,000 | 2016 | 18 |

## Russian Map - Slice A

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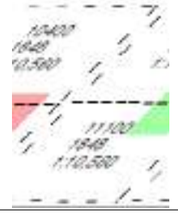
## Lancashire And Furness

## Published 1848

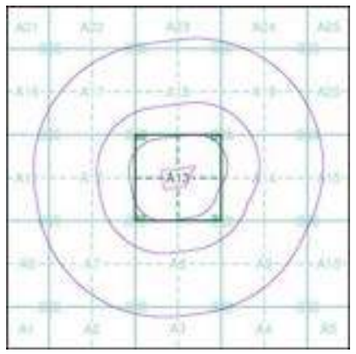
## Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

## Map Name(s) and Date(s)




## Historical Map - Slice A

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| Slice: | A |
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## Site Details

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## Cheshire

## Published 1882

## Source map scale - 1:10,560

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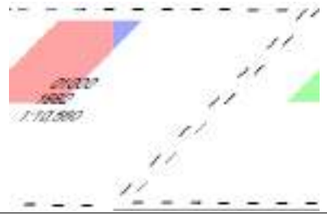
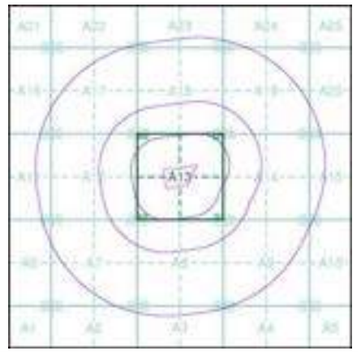


## Historical Map - Slice A

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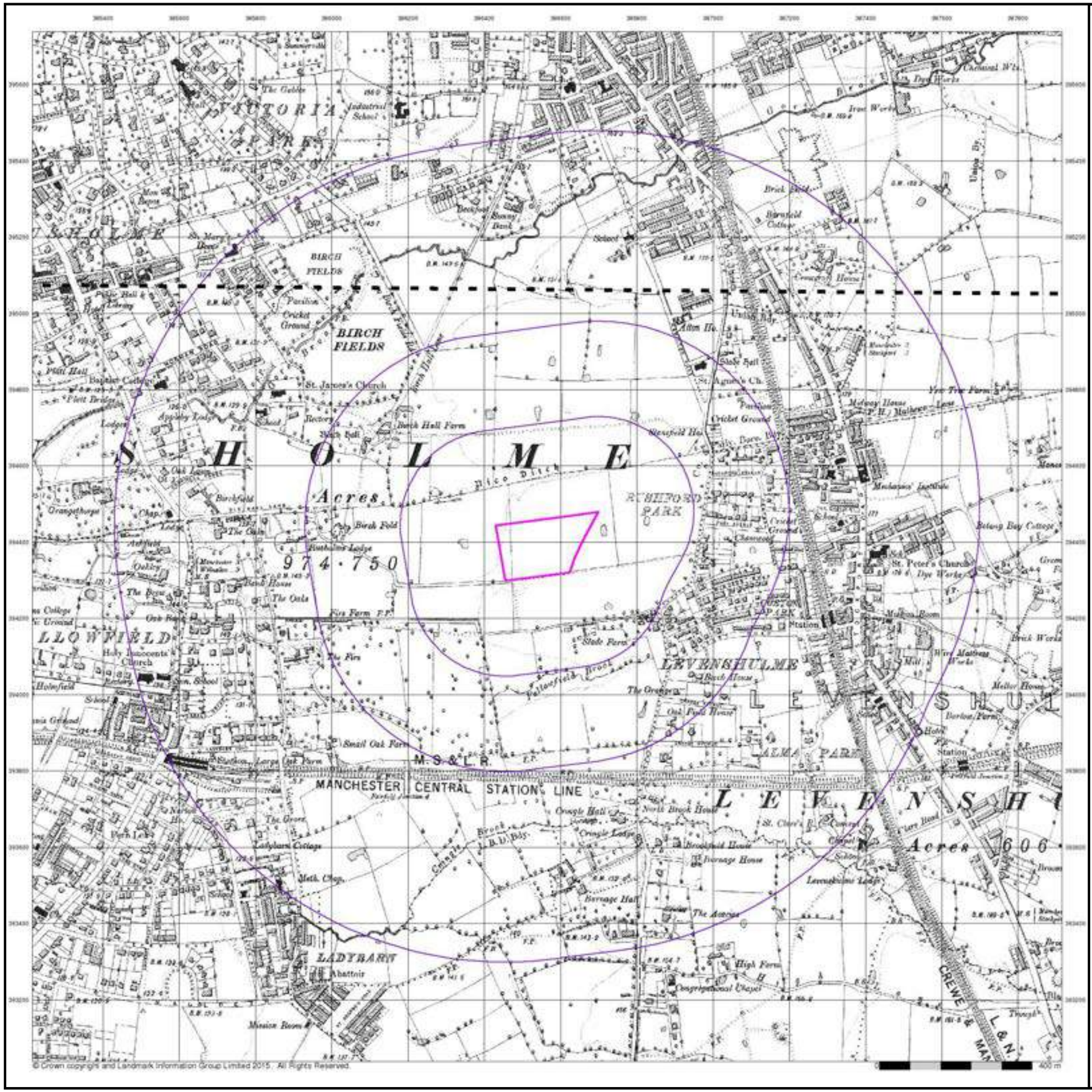
S H O L M E
VICTORIA SQUARE
BIRCH FIELDS
BIRCH FIELDS
Cricket Ground
Pavilion
Cricket Ground
Pavilion
St. James's Church
Rectory
Birch Hall
Birch Hall Farm
Fico Ditch
Acres
974·750
RUSHFORD PARK
Birch Fold
Birchfield
Grangethorpe
The Oaks
Fire Farm
Slade Farm
Slade Hall
Birchfield Cottage
Mall Hall
Baptist Cottage
Appleby Lodge
Lodge
Lodge
Rusholme Lodge
Ashfield
Quality
Mauldeth House
Holy Innocents' Church
Holmefield
Small Oak Farm
Large Oak Farm
The Firs
Fallowfield Brook
LLOWFIELD
LEVENSHULME
Birch House
The Grove
Oak Field House
Station
Station
Berlow Farm
Alma Park
M. S. & L. R.
MANCHESTER CENTRAL STATION LINE
Crossle Hall
North Brook House
Crossle Lodge
Brook
Ladybarn Cottage
Meth. Chap.
Burnage Hall
Burnage House
The Acorns
Lesmahagow Lodge
High Farm
Congregational Chapel
LADYBARN
Khattnir
Mission Room
Mauldeth Road
Mauldeth Road West
Mauldeth Road East
Mersey Bank
Brick Field
Barnfield Cottage
Barnfield House
Union St.
Iron Works
Dye Works
Brick Works
Wire Mattress Works
Mill
Meller House
Meltham Bay Cottage
Mechanics' Institute
Methodist Chapel
Sunday School
Vine Tree Farm
Methuen House (P.H.) Malthouse
Cricket Ground
Cricket Ground
Pavilion
Dyers Hill
Allen Hu.
Roundabout
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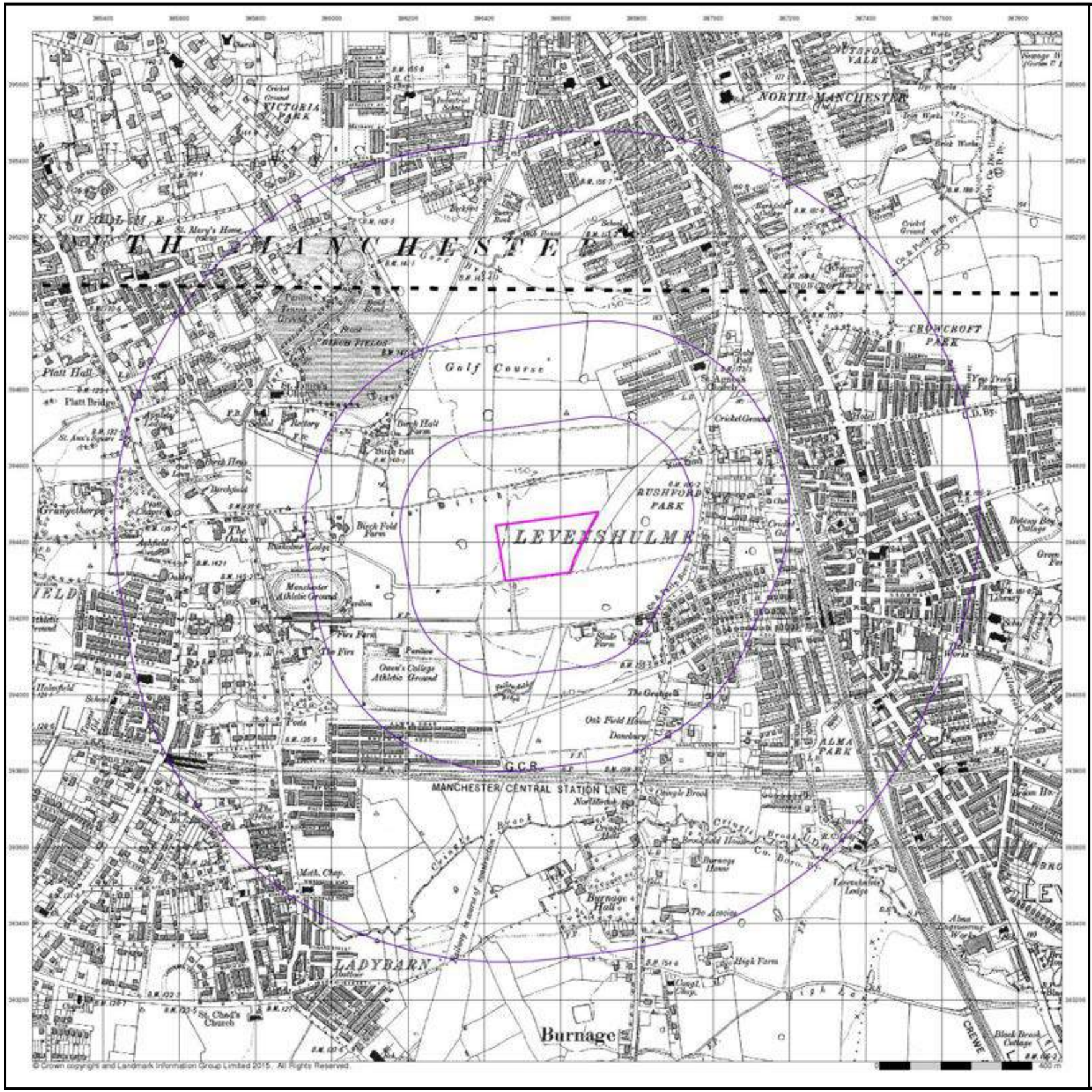
Union Bridge
Union St.
Union Bridge
Union St.



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RAMBOLL ENVIRON

## Lancashire And Furness

### Published 1908 - 1909

### Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

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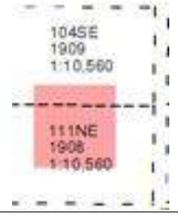
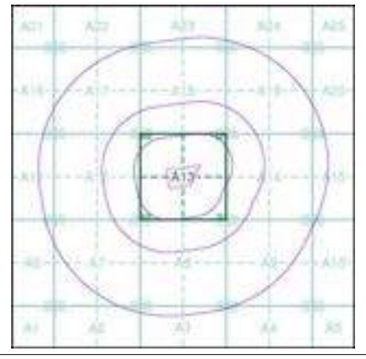



## Historical Map - Slice A

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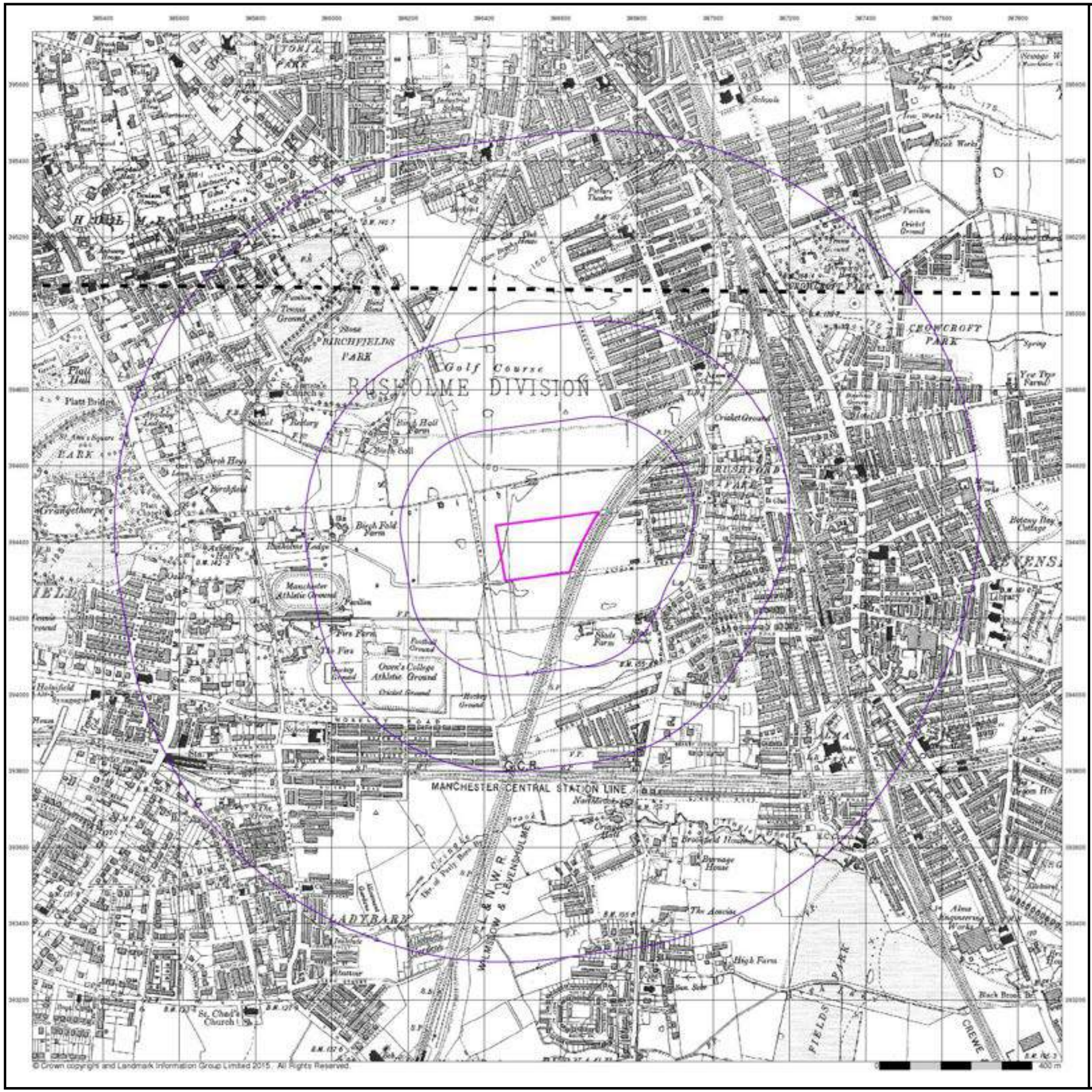
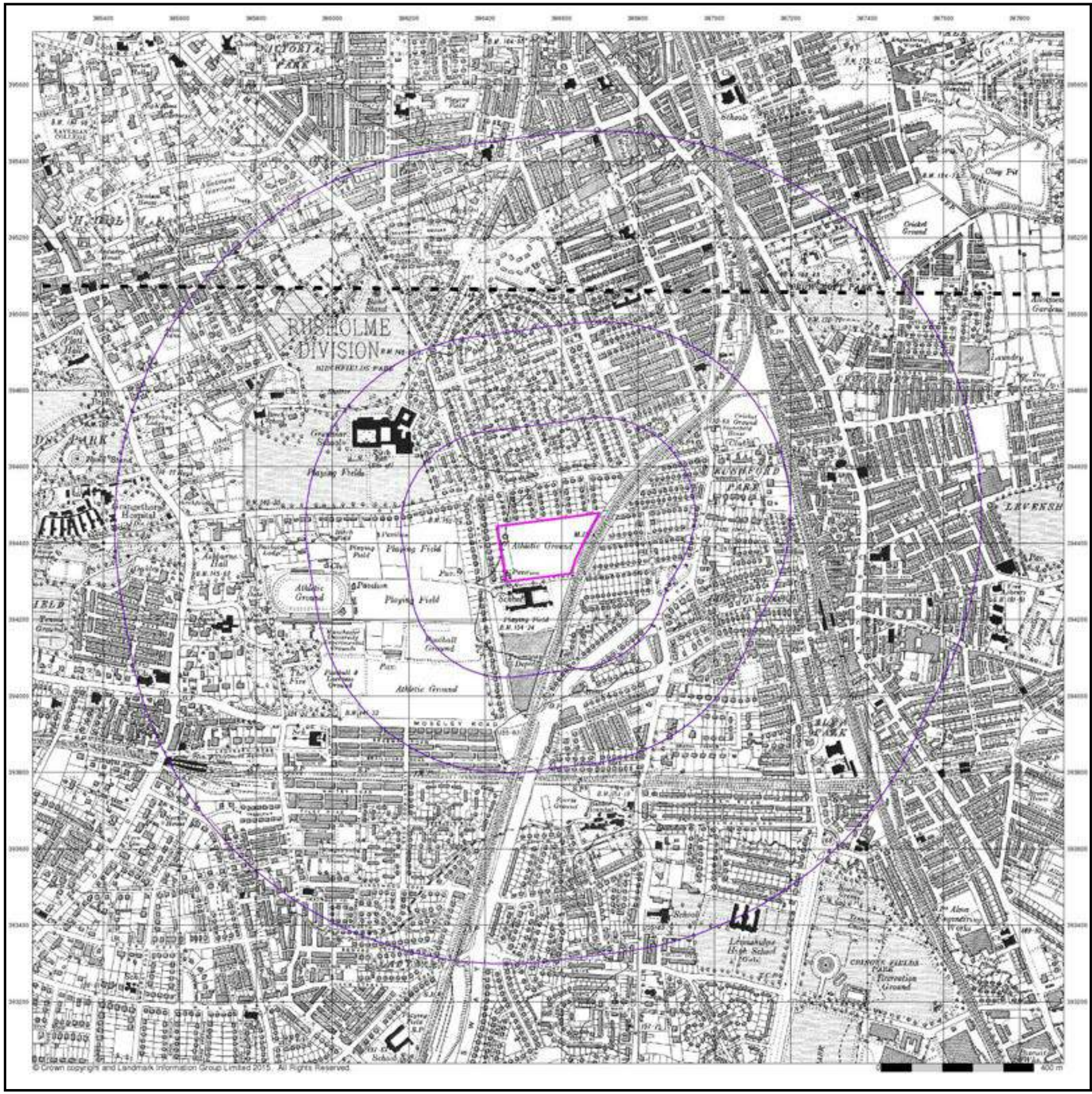

BIRCHFIELDS PARK
Golf Course
RUSHOLME DIVISION
CROWCROFT PARK
RUSHOLME PARK
Platt Hall
Platt Bridge
Grangethorpe
Birchfields
Birch Hall Farm
Birch Fold Farm
Rusholme Lodge
Manchester Athletic Ground
Fir Farm
The Firs
Owen's College Athletic Ground
Cricket Ground
Hockey Ground
Pavilion
Tennis Ground
Bowling Green
Pottery Theatre
Public Baths
Library
Brick Works
Spring
Yew Tree Farm
Botany Bay Cottage
Shade Farm
Burnage House
The Avenue
High Farm
Alma Engineering Works
Brookfield House
Rusholme Park
Rusholme Hall
Rusholme Grove
Rusholme Terrace
Rusholme Place
Rusholme Gardens
Rusholme Road
Wilmslow Road
Lytham Road
Birch Hall Lane
Birchfields Road
Grangethorpe Road
Platt Bridge Road
Fields Park
Crewe
Black Brook
Cricket Ground
Tennis Courts
Bowling Green
Hockey Ground
Pavilion




RAMBOLL ENVIRON

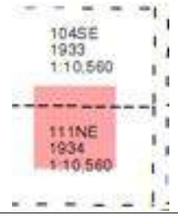
## Lancashire And Furness

### Published 1933 - 1934

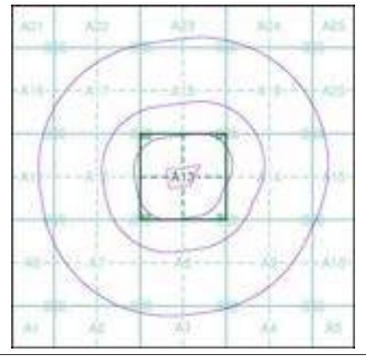
### Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

## Map Name(s) and Date(s)




## Historical Map - Slice A




## Order Details

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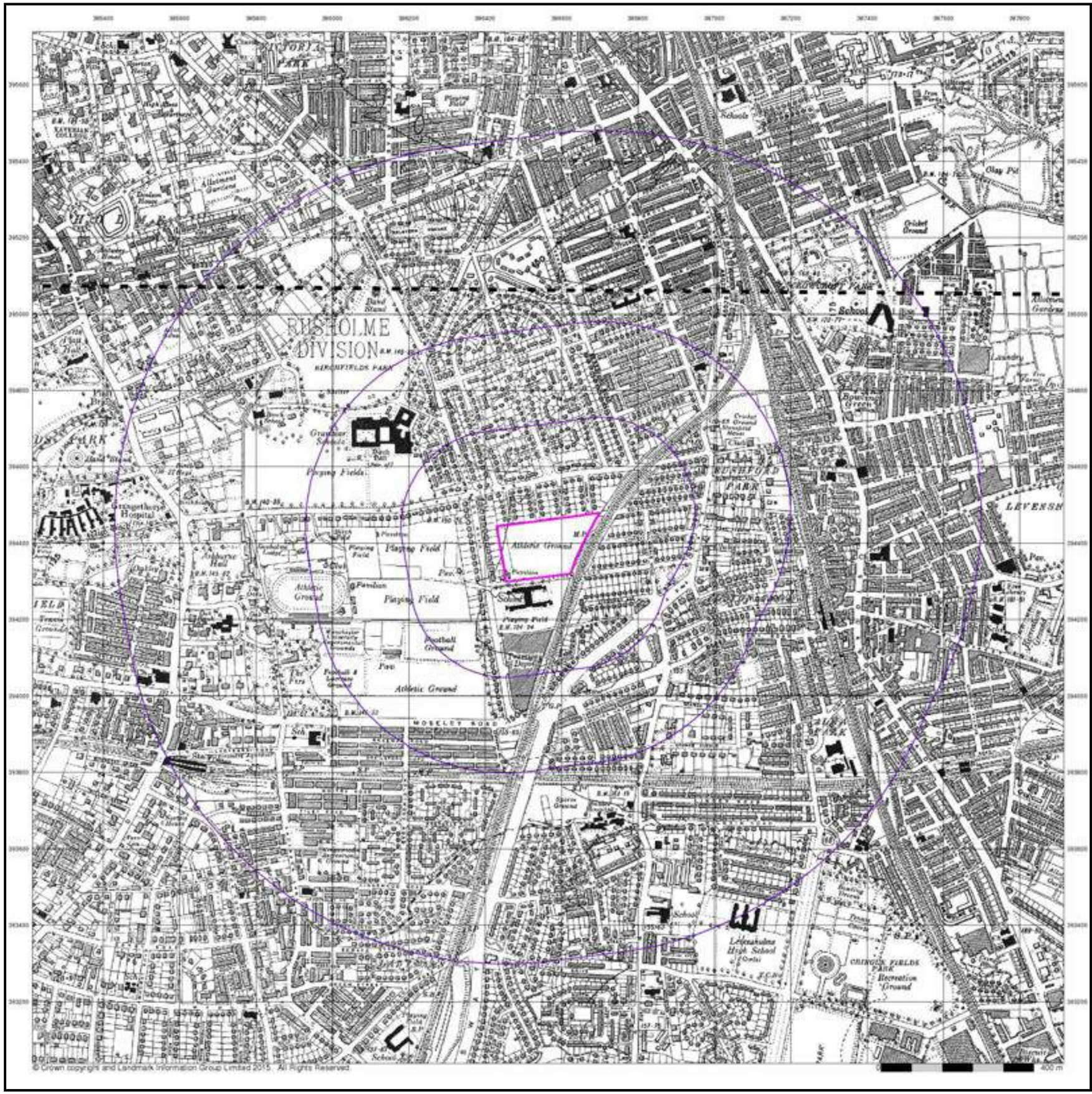
|---|---|
| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386560, 394400 |
| Slice: | A |
| Site Area (Ha): | 3.21 |
| Search Buffer (m): | 1000 |

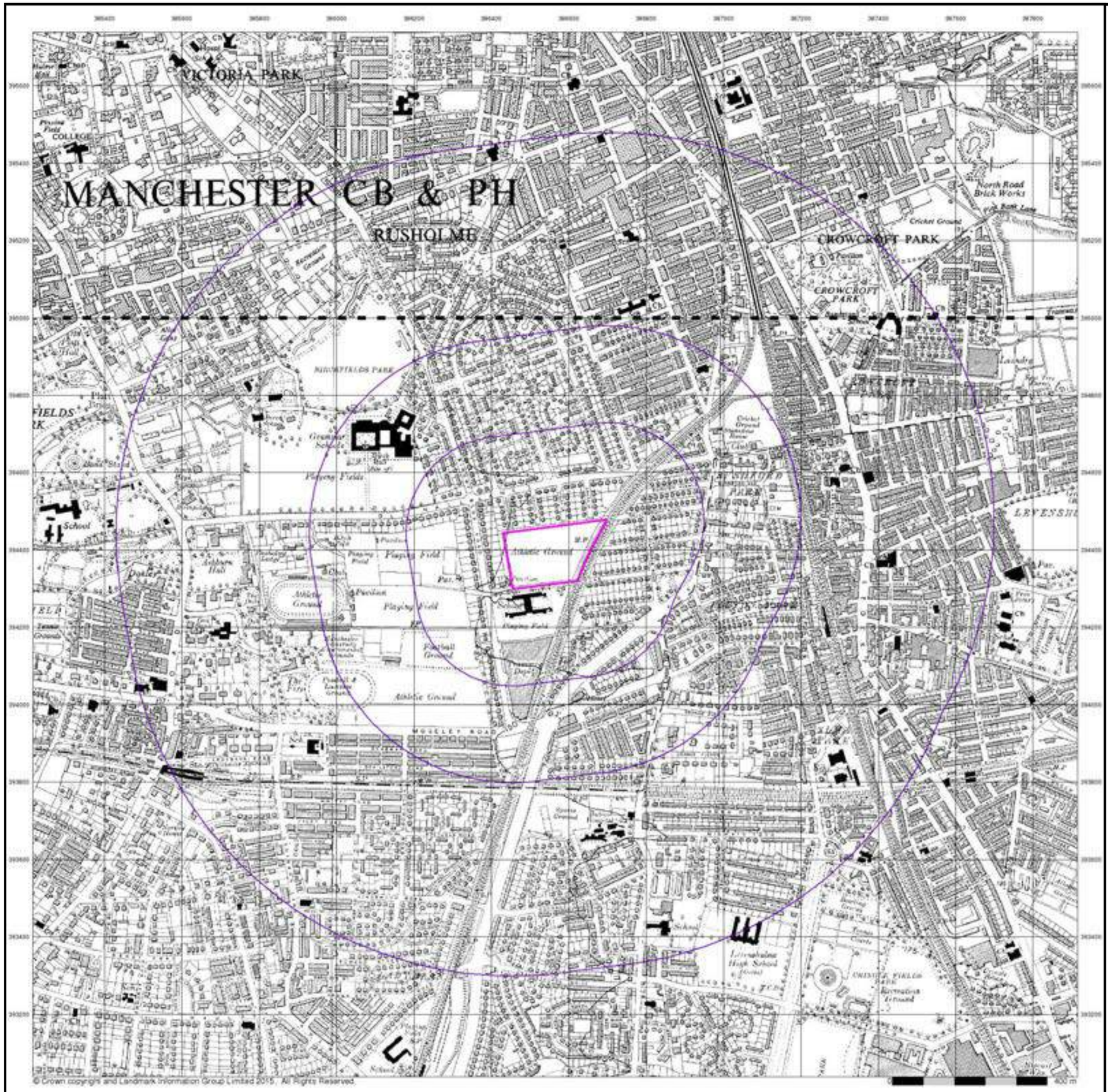
## Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

Landmark Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk


RUSHOLME
DIVISION
BIRCHFIELDS PARK
Grammar Schools
Playing Fields
Athletic Ground
Football Ground
Athletic Ground
Playing Field
Pavilion
Athletic Ground
MOSELEY ROAD
Levenshulme High School (Girls)
CRINGLE FIELDS
Recreation Ground
Cricket Ground
Bowling Green
Clay Pit
Laundry
Grosvenor Hospital
Sch
School
LEVENSH
PARK
FIELD
Tennis Courts
Pav
Pav
Pav




RAMBOLL ENVIRON

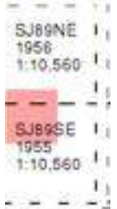
## Ordnance Survey Plan

### Published 1955 - 1956

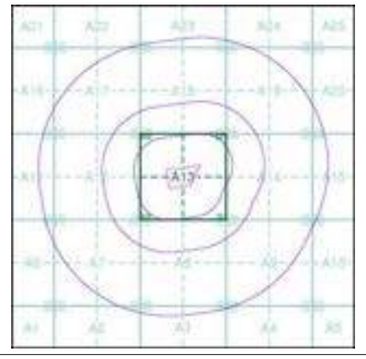
### Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

## Map Name(s) and Date(s)




## Historical Map - Slice A




## Order Details

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| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386560, 394400 |
| Slice: | A |
| Site Area (Ha): | 3.21 |
| Search Buffer (m): | 1000 |

## Site Details

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Landmark Information Group

Tel: 0844 844 9952
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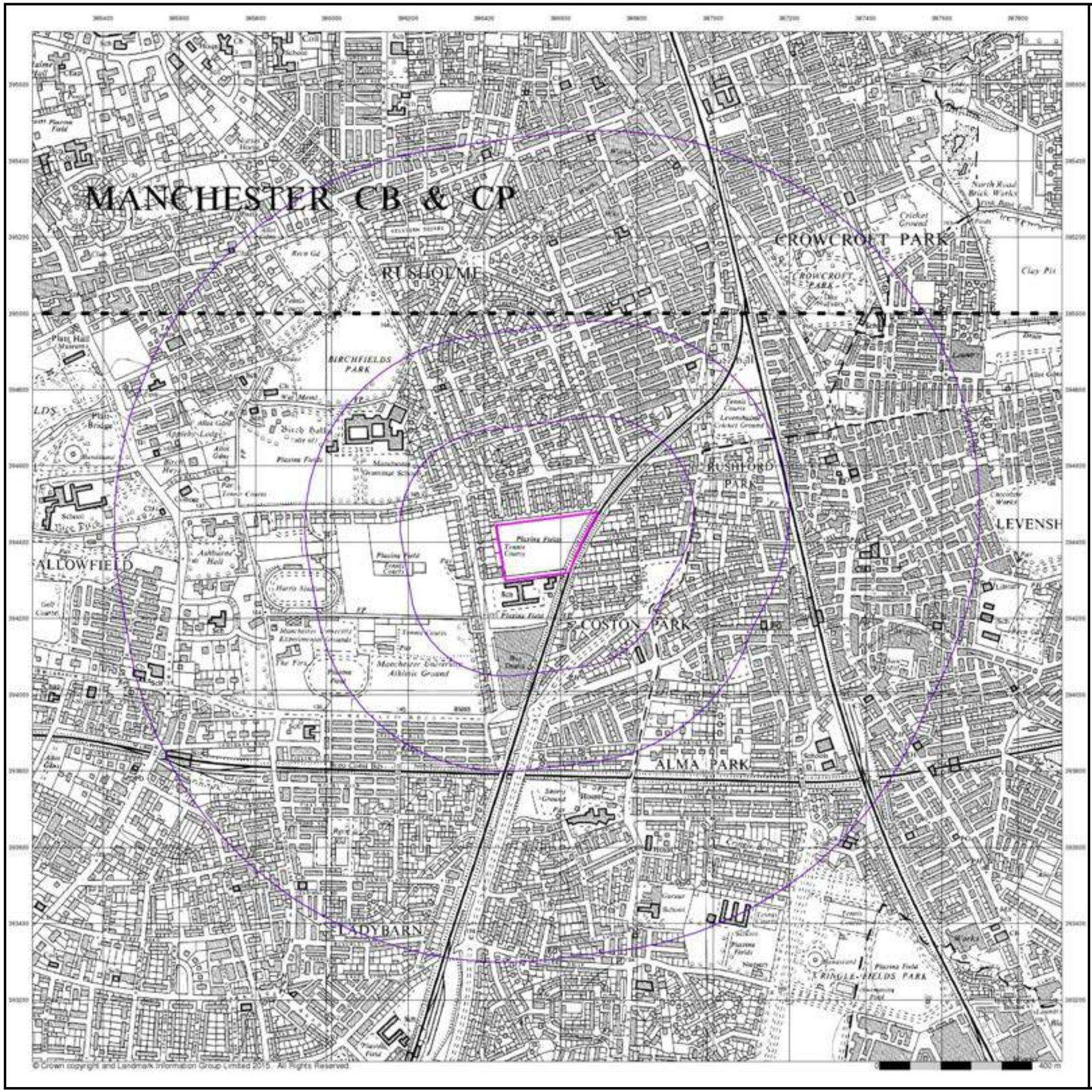
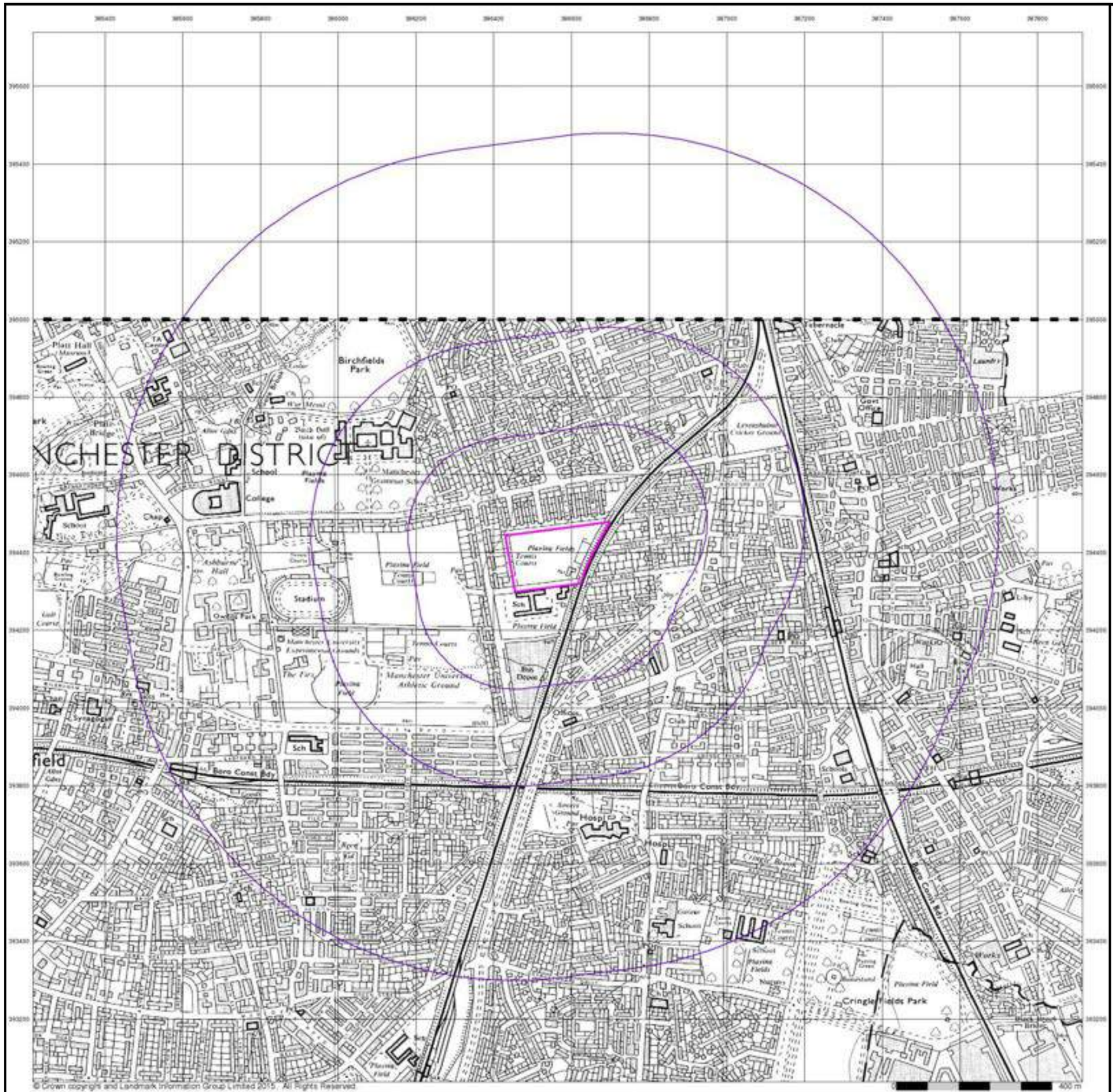
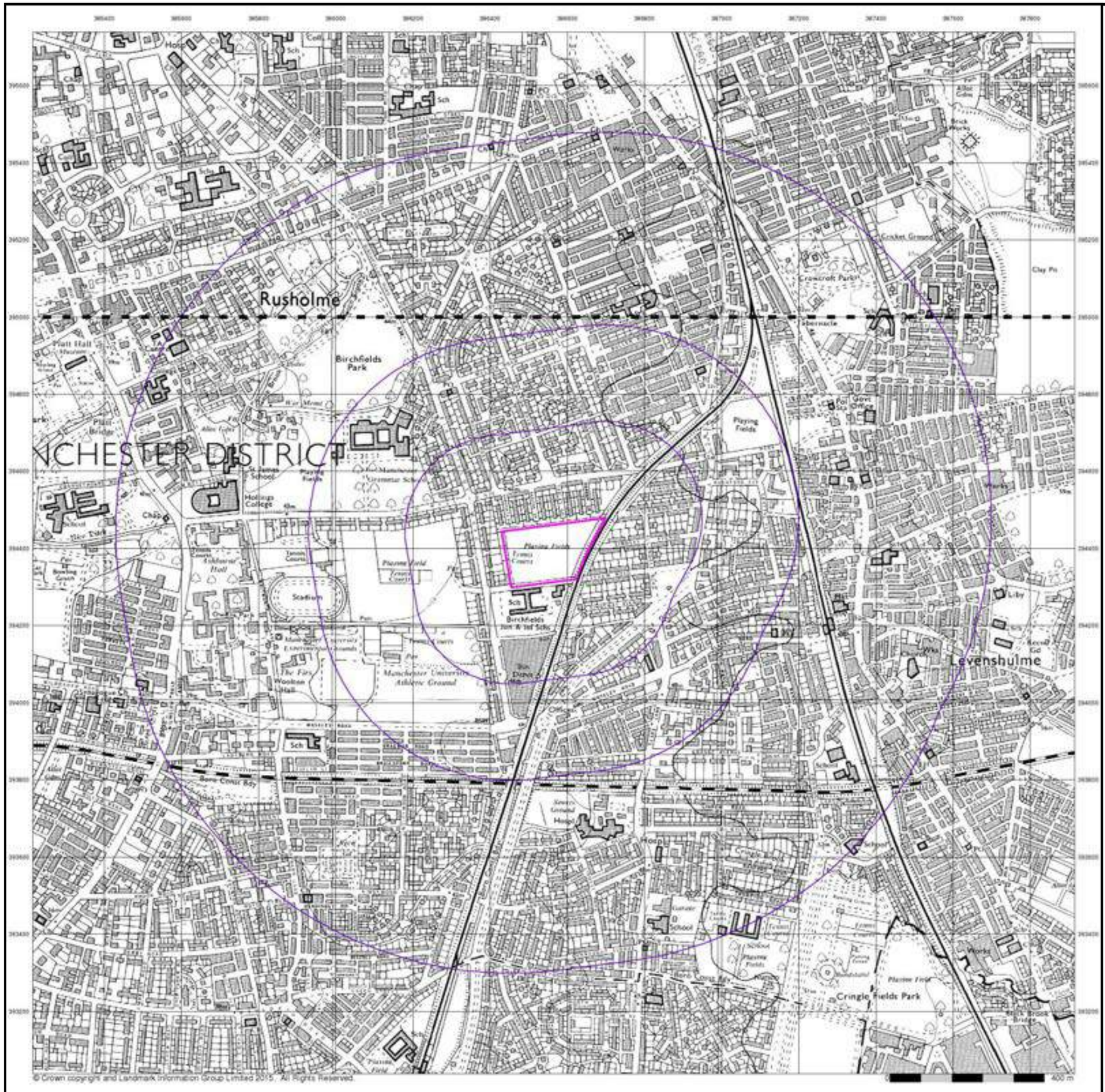
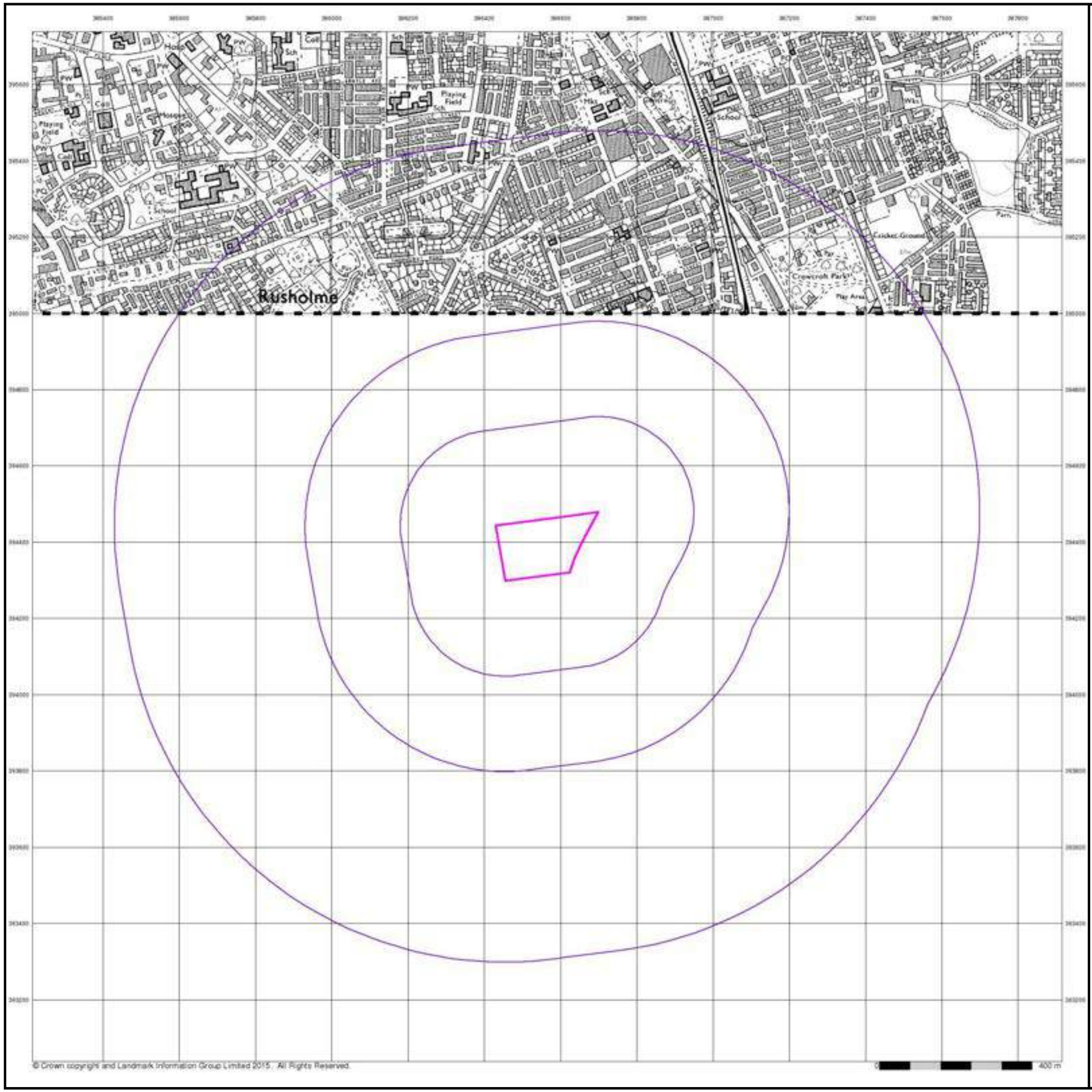

MANCHESTER CB & CP
RUSHOLME
CROWCROFT PARK
BIRCHFIELDS PARK
RUSHOLME PARK
ALLOWFIELD
COSTON PARK
ALMA PARK
LADYBARN
FRINGE FIELDS PARK
LEVENSH
Platt Hall Museum
Manchester Grammar Sch
Manchester University Athletic Ground
Harris Stadium
Cricket Ground
Tennis Courts
Bowling Green
Clay Pit
Brick Works
Chocolate Works
Schools
Works
Library
Church
Pavilion
Bridge
Ashburne Hall
Golf Course
Aqueduct Lodge
Birch Hall
Plasma Fields
Plasma Field
Fringe Field
Fringe Fields
Hockey Ground
Rugby Ground
Sports Ground
Allot Gdns
Mount
Ch
Sch
Pav
Lib
Wks
Bdge
Fm
Cott
Ho
Rec Gd
Tennis Courts
Bowling Green
Cricket Ground
Levenshulme Cricket Ground

РАШОЛМ
БЕРНИДЖ
парк
Берчфилдс
спорт. пл.
автоб.гар.
больн.
ул. СТОКПОРТ - РОД
ул. ДИНЕНСОН - РОД
ул. МОСЛИ - РОД
ул. МОЛДЕТ - РОД
ул. ХРОСЛИ - РОД
ул. ХОЛЛ - ЛЕЙН
ул. БЕРЧФИЛД - ХОЛЛ - ЛЕЙН
ул. УИЛМСЛОУ - РОД
ул. ЛИНГЕРТОН - РОД
ул. ЛЕЙНИДОН - РОД
ул. АНСОН - РОД
ул. МАТЬЮС - ЛЕЙН
ул. БАРЛО
ул. ЛИНГЕРДЖ
ул. СЛЕЙД
ул. АЛЬБЕРТ - РОД
ул. ГАМИЛЬТОН - РОД
ул. БЕРЧ
ул. НОРТ - РОД
ул. БАНН - ЛЕЙН
ул. ОЛД - ХОЛЛ - ЛЕЙН
ул. ЛИНГЕРТОН - РОД
ул. ЛИНГЕРДЖ
ул. СЛЕЙД
ул. СТОКПОРТ - РОД
ул. ЛЕЙНИДОН - РОД
ул. ДИНЕНСОН - РОД
ул. ХРОСЛИ - РОД
ул. МОСЛИ - РОД
ул. МОЛДЕТ - РОД
ул. УИЛМСЛОУ - РОД


Birchfields Park
Platt Hall
Platt Bridge
Tabernacle
Laundry
Grove Cottage
Emmanuel Cricket Ground
NCHESTER DISTRICT
School
College
Matthews Grammar School
Playing Fields
Tennis Courts
Stadium
Ashburne Hall
Owens Park
Manchester University Athletic Ground
The Firs
Bob Dixon
Synagogue
Boro Const Bdy
Hospl
Cringle Fields Park
Works
Sch
Chap
Pav
Allot Gdns
Bowling Green
Lake
Rec Gd
Grd
Pond
Path
Fm
Ch
Mast
Tk
Cemetery
Sewage Works
Sewage Farm
Sewage Filter Beds
Sewage Disposal Works
Sewage Pumping Station
Refuse Disposal Works
Refuse Tip
Slip Road
Subway
Foot Bridge
Bridge
Weir
Mound
Dam
Pond (dry)
Pond (liquid)
Pond (water)
Reservoir
Aqueduct
Lock
Sluice Gate
Tunnel
Cutting
Embankment
Quarry
Pit
Spoil Heap
Clay Pit
Boundary Stone
Milestone
Milepost
Guide Post
Telephone Kiosk
Post Box
Pillar Box
Fire Station
Police Station
Public Convenience
Drinking Fountain
Shelter
Bus Station
Coach Station
Tram Station
Rly Station
Level Crossing
Tunnel
Viaduct
Aerial Cable
Pylon
Electricity Transformer
Electricity Substation
Gas Governor
Gas Holder
Gas Valve
Oil Storage Tank
Oil Well
Oil Pipeline
Water Tower
Water Pumping Station
Water Tank
Water Trough
Water Valve
Water Hydrant
Water Meter
Water Pipeline
Telephone Exchange
Telephone Cable
Telephone Line
Telephone Pole
Telephone Mast
Telephone Tower
Telephone Wire
Telephone Box
Telephone Kiosk


Rusholme
Birchfields Park
Levenshulme
Cringle Fields Park
Platt Hall
Hollings College
Stadium
Manchester University Athletic Ground
Crematorium
Cricket Ground
Playing Fields
Lytham Road
Birchfields Jun. & Inf. Schs
Grammar Sch
Sch
Works
Chip
Pub
Mkt
Ch
Hosp
Cem
Allotments
Bowling Green
Tennis Courts
Pavilion
Bus Depot
Sewage Works
Refuse Disposal
Brick Works
Clay Pit
Aberavon
Cricket Ground
Crematorium
Playing Fields
Works
Cringle Fields Park
Levenshulme
Stadium
Manchester University Athletic Ground
Hollings College
Platt Hall
Birchfields Park


Rusholme
Playing Field
Crowcroft Park
Cricket Ground
School
Sch
Cem
Hosp
Pk
Ch
Mkt
Wks
Gdns
Play Area
PW
PO
Rec
Cas
Cut
Ind Est
Sta
Fm
Ct
Par
Allot
Ref
Lib
Mus
Pol Sta
Fd
Hall
Coll
Ret Pk
Sub Sta
Ambs Sta
Fire Sta
Liby
Ind Hse
Ind Pk
Ind Units
Ind Sch
Ind Coll
Ind Hall
Ind Ct
Ind Gdns
Ind Mus
Ind Liby
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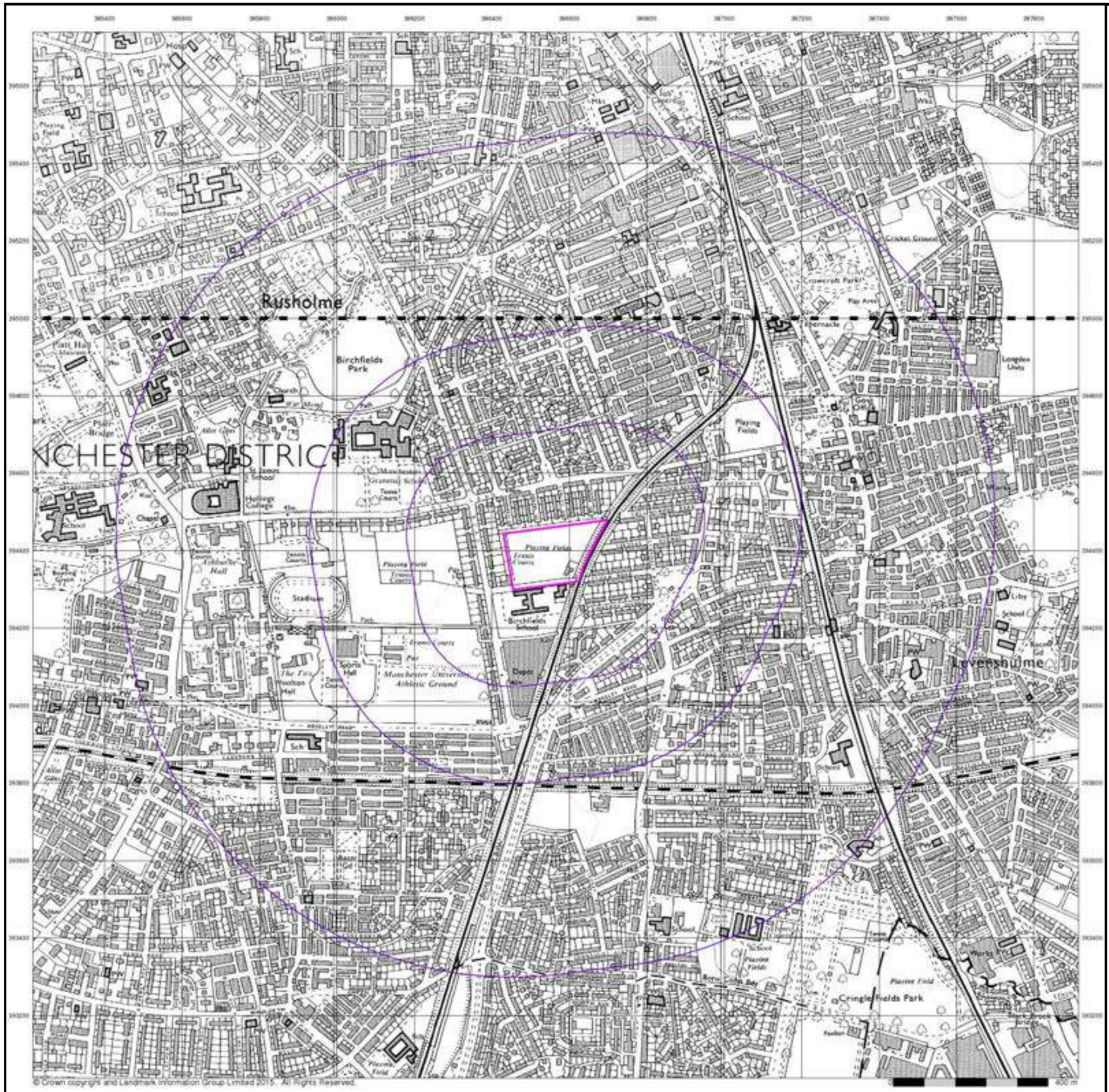
Ind Ret Pk
Ind Sub Sta
Ind Ambs Sta
Ind Fire Sta
Ind Pol Sta
Ind Allot
Ind Ref
Ind Lib



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RAMBOLL ENVIRON

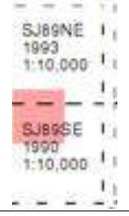
## Ordnance Survey Plan

### Published 1990 - 1993

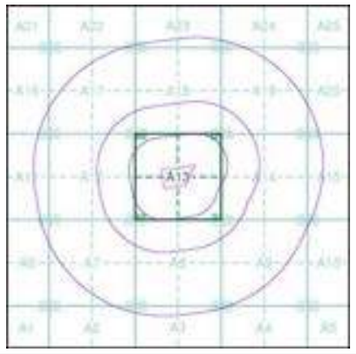
### Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

## Map Name(s) and Date(s)




## Historical Map - Slice A




## Order Details

| | |
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| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386560, 394400 |
| Slice: | A |
| Site Area (Ha): | 3.21 |
| Search Buffer (m): | 1000 |

## Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

Landmark

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

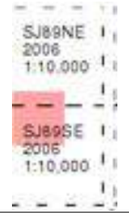
## 10k Raster Mapping

## Published 2006

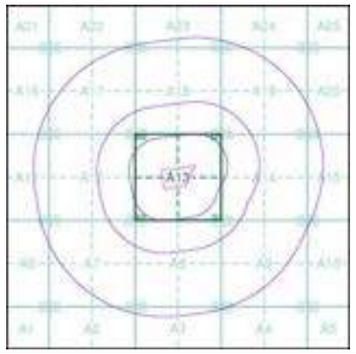
## Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

## Map Name(s) and Date(s)




## Historical Map - Slice A




## Order Details

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| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
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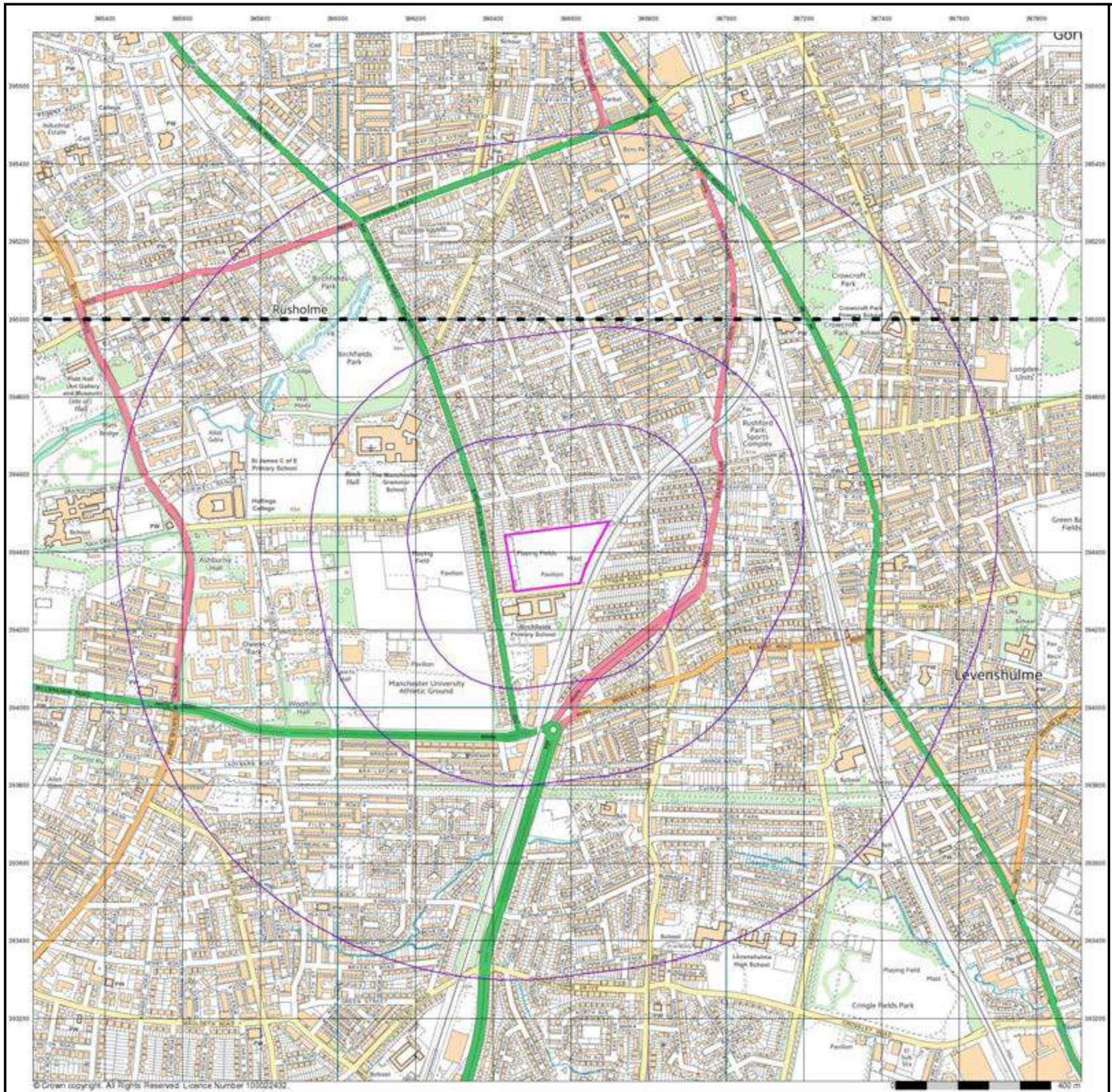



RAMBOLL ENVIRON

## VectorMap Local

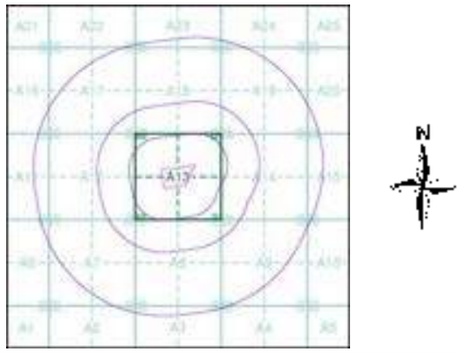
**Published 2016**

**Source map scale - 1:10,000**

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities),1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

## Map Name(s) and Date(s)

## Historical Map - Slice A




## Order Details

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| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
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| Site Area (Ha): | 3.21 |
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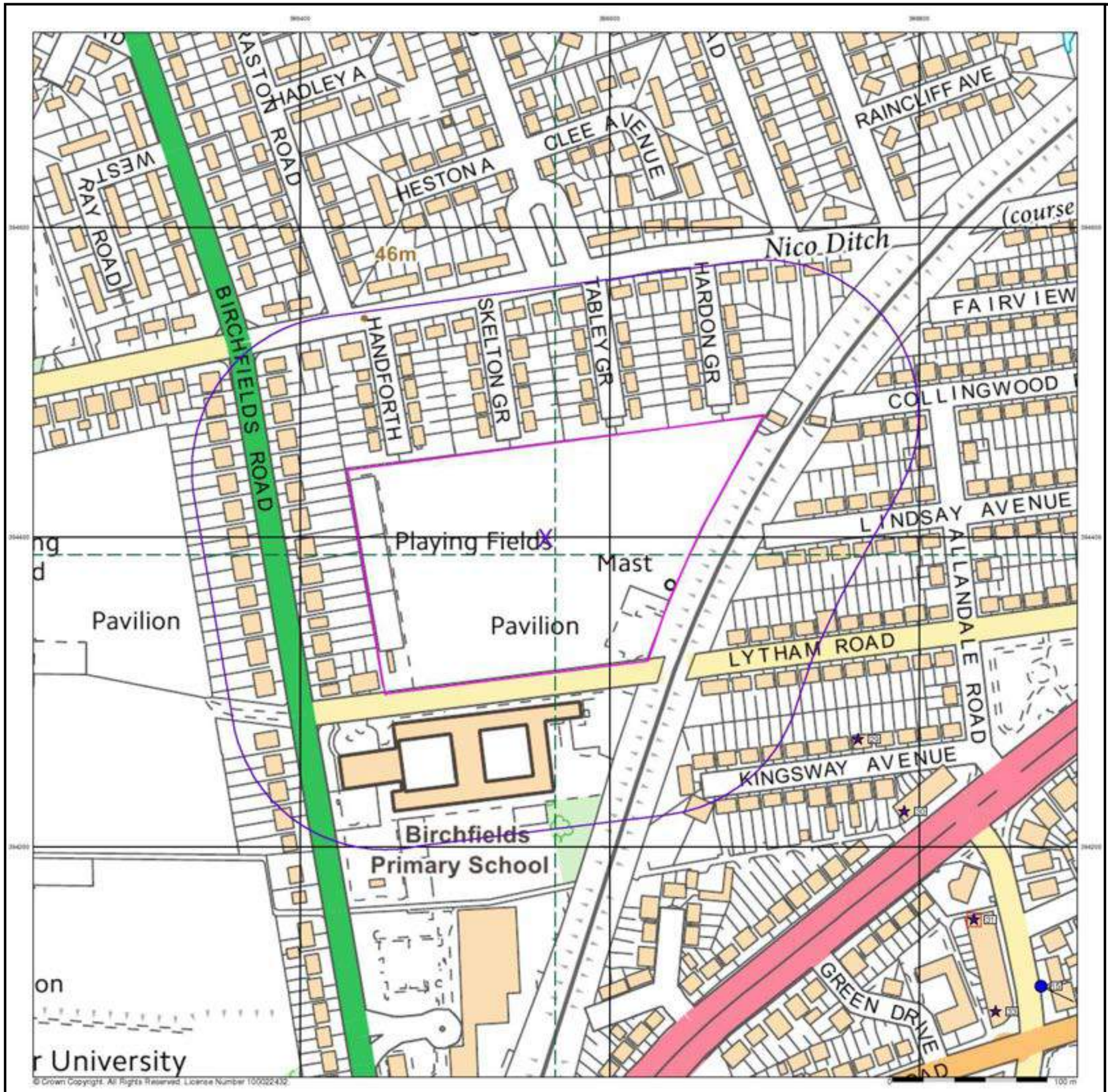
## Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

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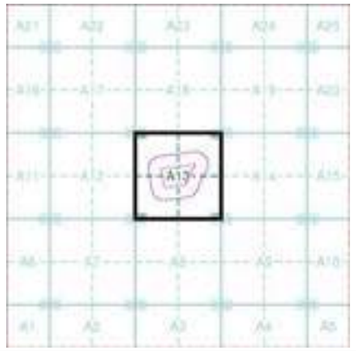
[redacted]

## Site Sensitivity Map - Segment A13




## Order Details

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| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386560, 394400 |
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Web: www.envirocheck.co.uk

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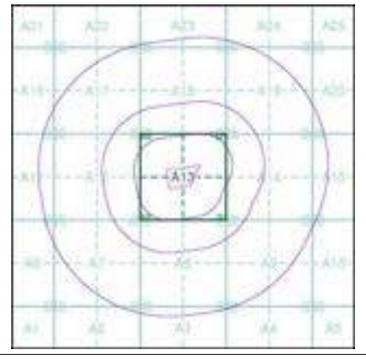
[redacted]

## Site Sensitivity Map - Slice A

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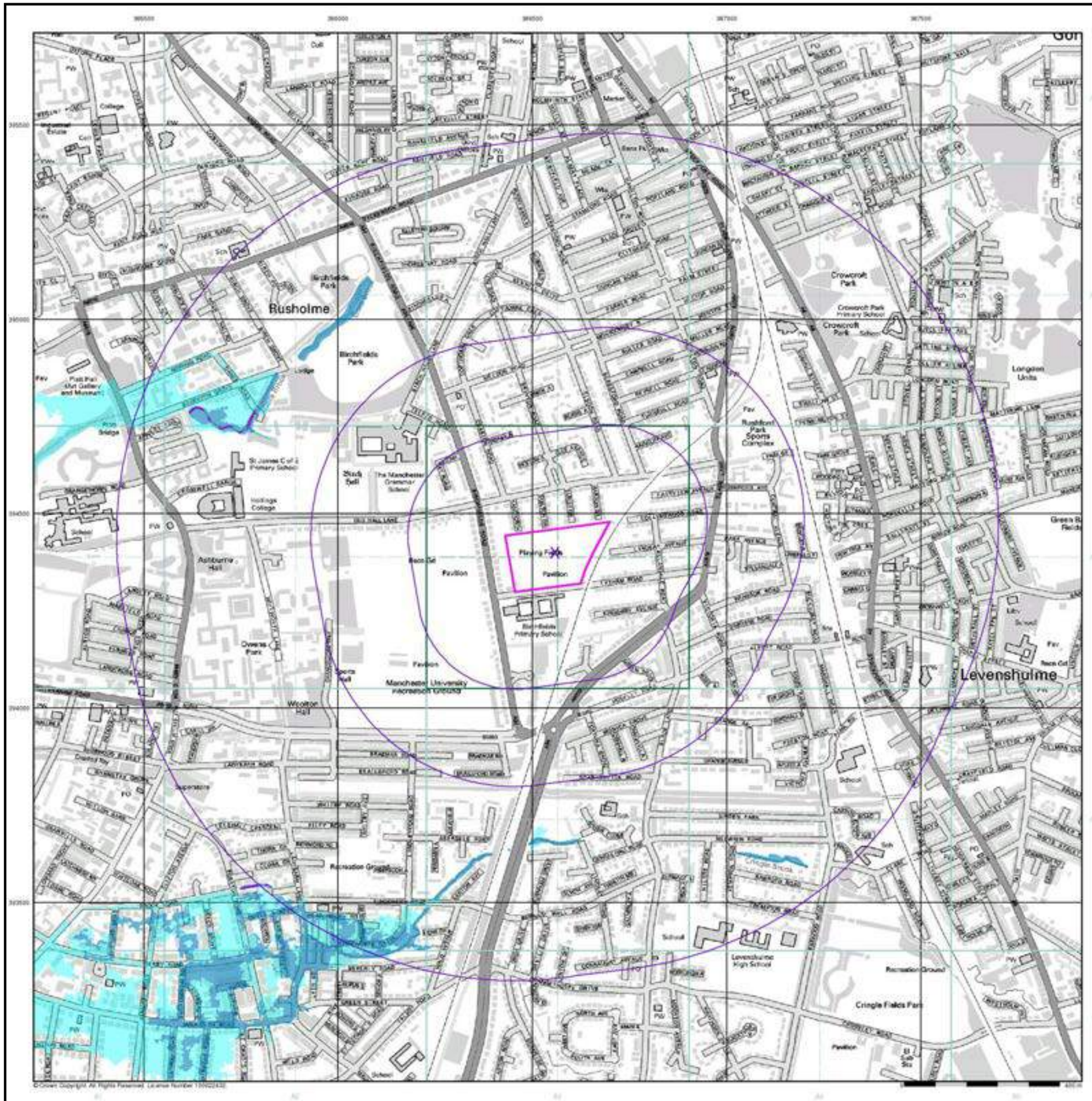
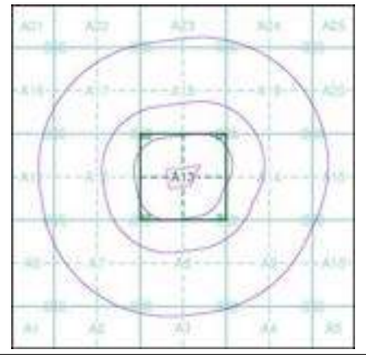



RAMBOLL ENVIRON

[redacted]

## Flood Map - Slice A

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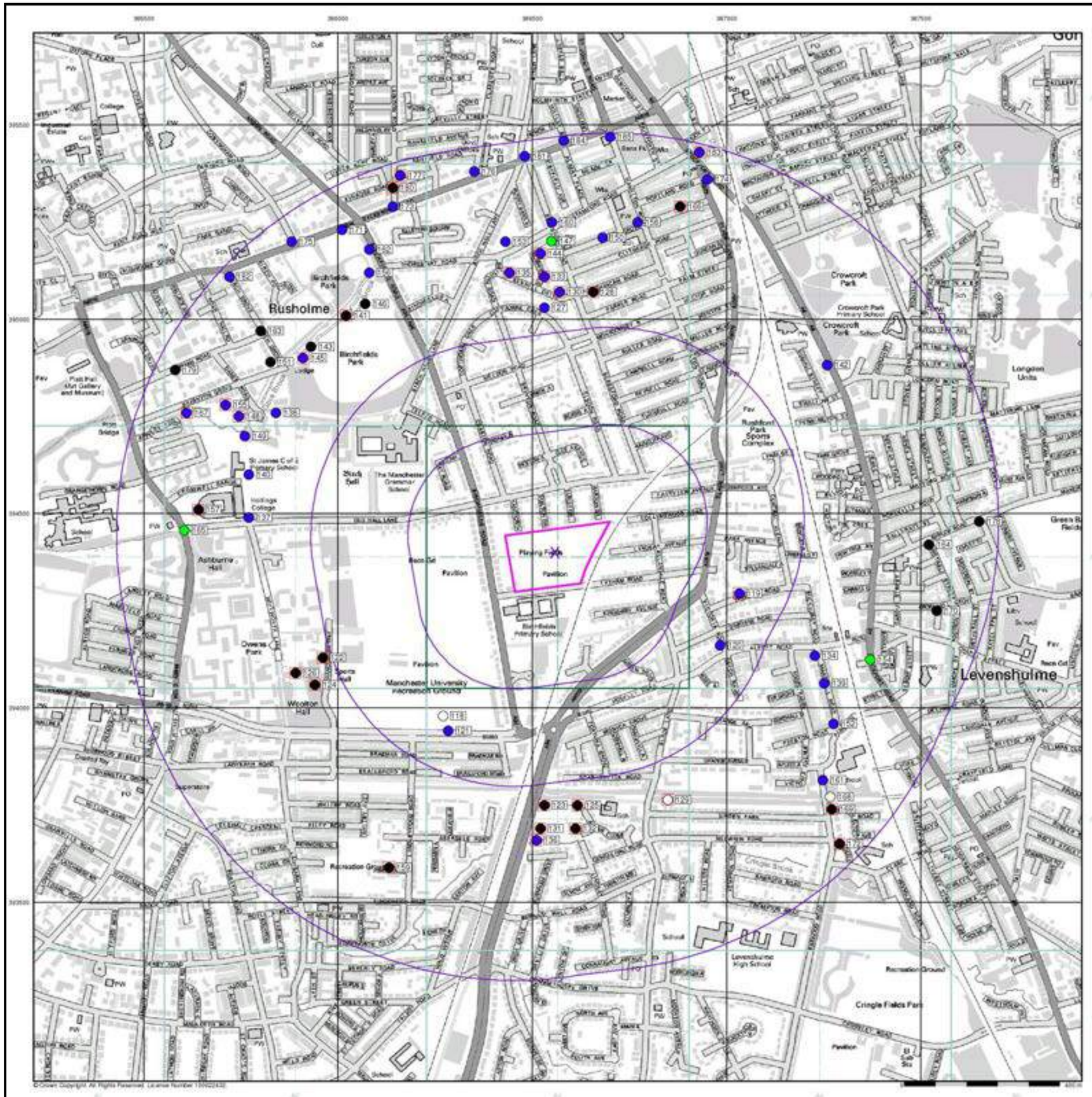
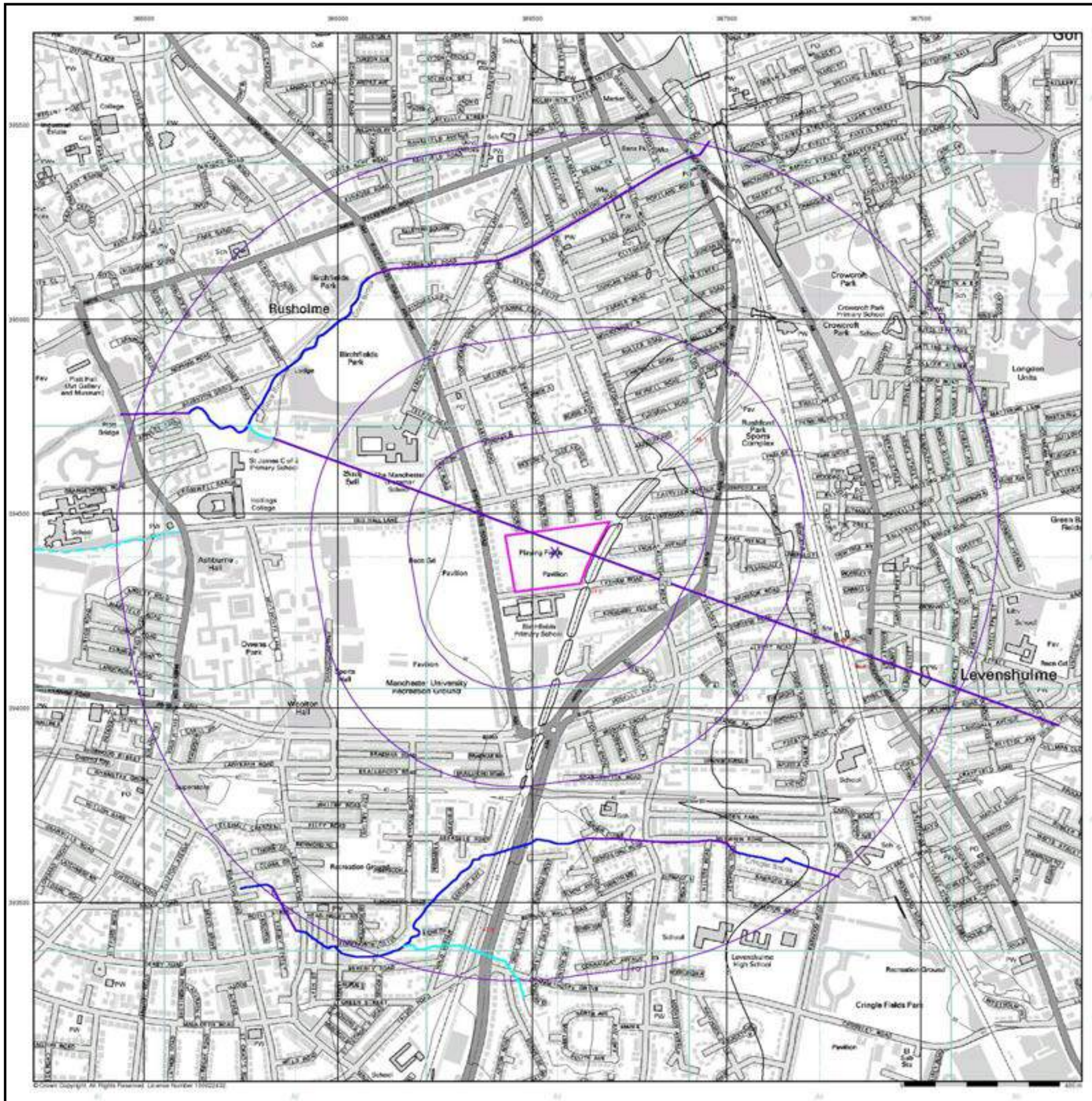
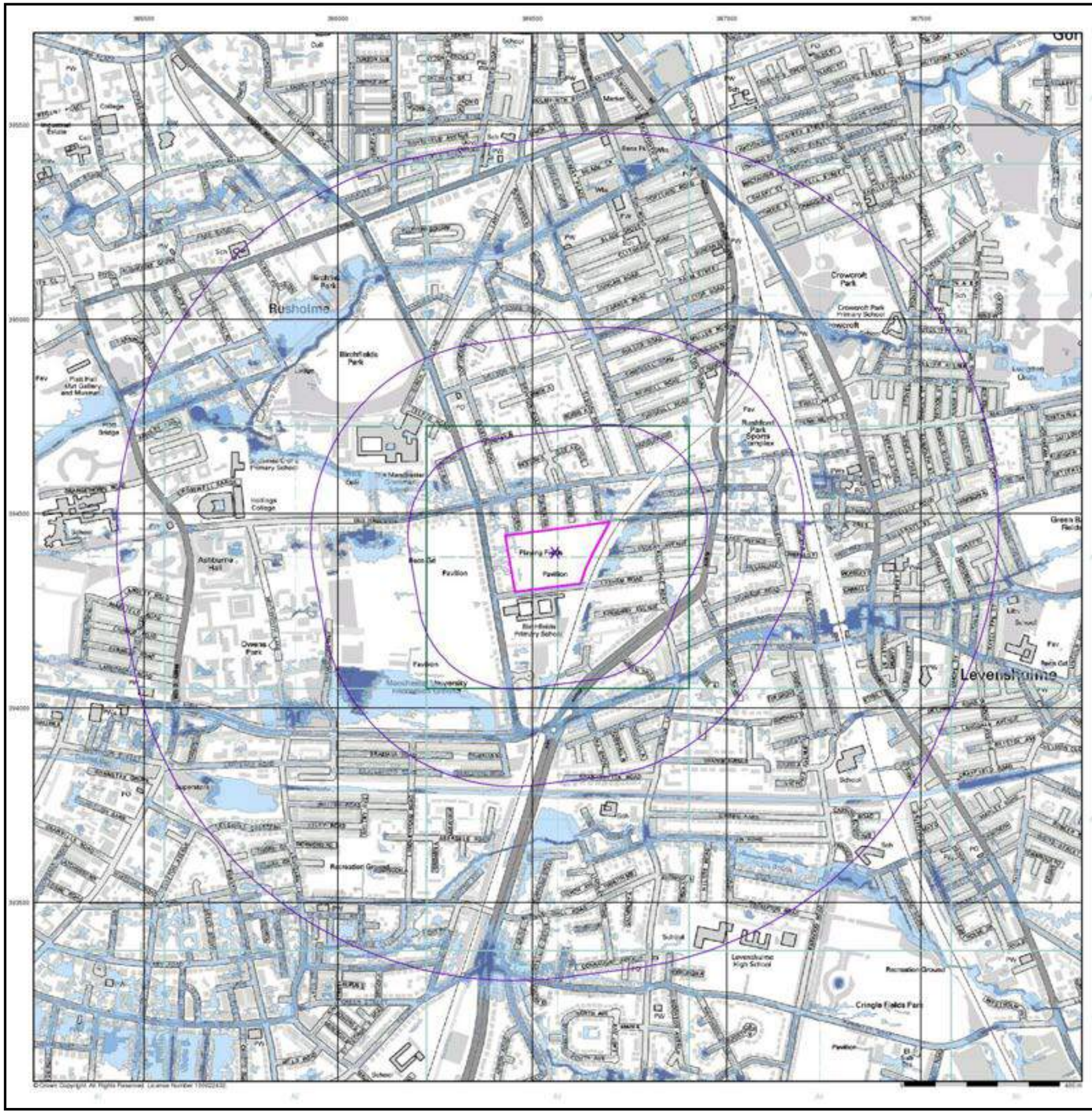

Rusholme
Levenshulme
Crowcroft Park
Birchfields Park
Ashburne Hall
Wilbraham Road
Lytham Road
Platt Hall Art Gallery and Museum
Crowcroft Park Primary School
Birchfields Primary School
Manchester University Fallowfield Campus
Levenshulme High School
Cringle Fields Park
Longsight Units
Pavilion
Sports Hall
Recreation Ground
Supermarket
Post Office
Library
Church
Mosque
College
School
Fire Station
Bus Station
Car Park
Tennis Courts
Bowling Green
Cricket Pitch
Playing Fields
Allotments
Cemetery
Golf Course
Public House
Hotel
Nursing Home
Hospital
Clinic
Dentist
Veterinary Surgery
Fire Station
Police Station
Post Office
Telephone
Library
Museum
Art Gallery
Theatre
Cinema
Concert Hall
Sports Centre
Swimming Pool
Ice Rink
Golf Course
Tennis Courts
Bowling Green
Cricket Pitch
Playing Fields
Allotments
Cemetery


Rusholme
Levenshulme
Birchfields Park
Crowcroft Park
Longsight Units
Ashburne Hall
Manchester University Intercollegiate Ground
Wroxton Hall
Cringle Fields Park
Birchfields Primary School
Crowcroft Park Primary School
Crowcroft Park School
Levenshulme High School
Rusholme Park Sports Complex
St James C of E Primary School
Whalley Range High School
Platt Hall (Art Gallery and Museum)
Owens Park
Pavilion
Recreation Ground
Supermarket
Lodge
Iron Bridge
Sluice
Sch
Pav
Ref
Fb
Mkt
Cem
Ch
Mon
Sta
Ind Est
Coll
Sports Hall
Tennis Courts
Bowling Green
Allotments
Nursery
Hospital
Fire Station
Police Station
Library
Post Office
Telephone Exchange
Public Toilets
Car Park
Bus Station
Bus Stn
Bus Garage
Bus Depot
Bus Terminus
Bus Shelter
Bus Stop
Tram Stop
Tram Depot
Tram Terminus
Tram Shelter




RAMBOLL ENVIRON

[redacted]

## EA/NRW Suitability Map - Slice A

## Order Details

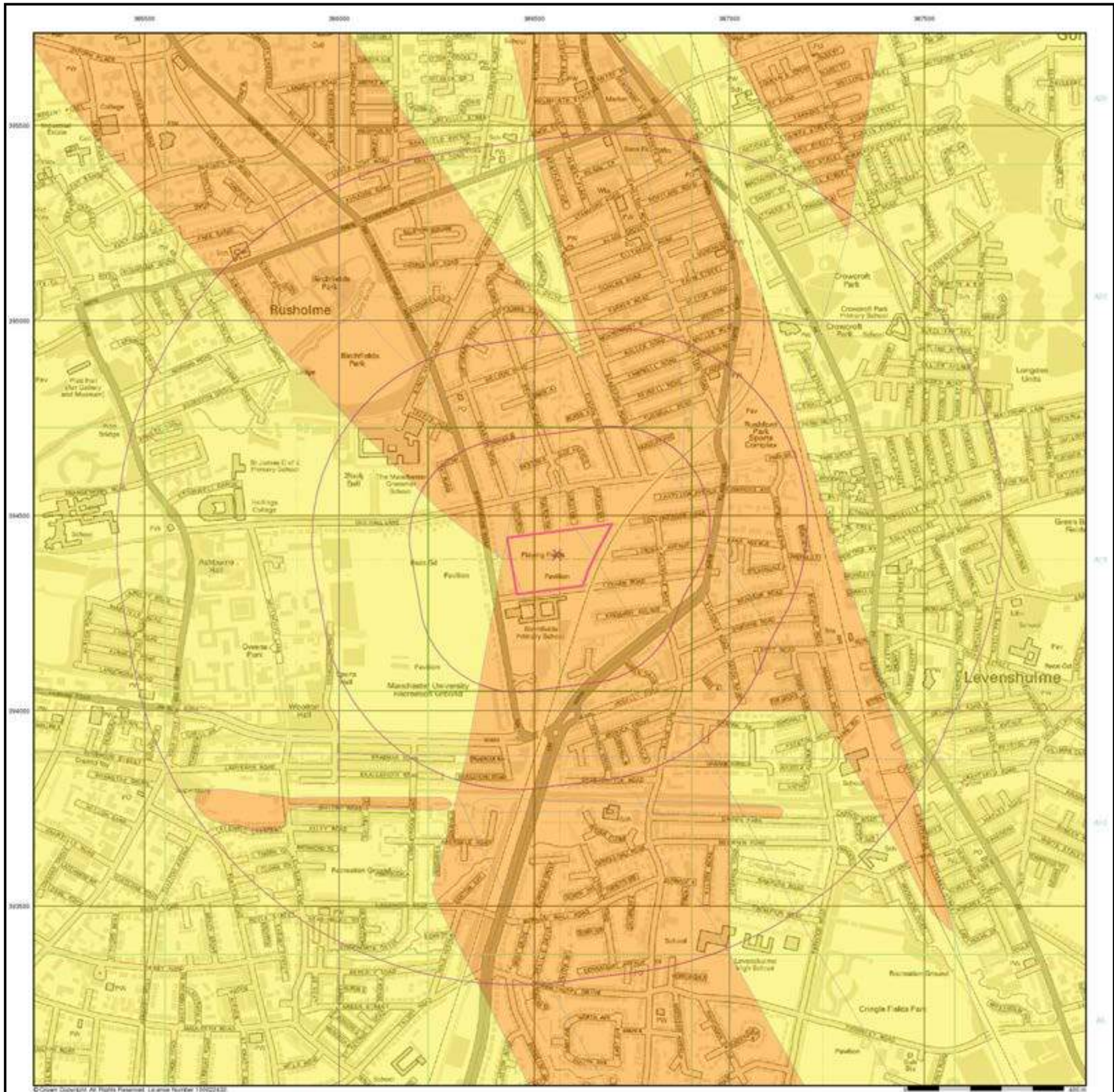
| | |
|---|---|
| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386560, 394400 |
| Slice: | A |
| Site Area (Ha): | 3.21 |
| Search Buffer (m): | 1000 |

## Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

Landmark Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

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RAMBOLL ENVIRON

## General

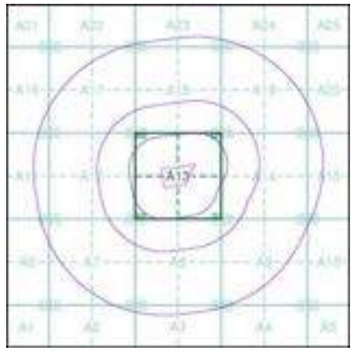
Specified Site  Specified Buffer(s)  Bearing Reference Point

## Estimated Soil Chemistry Arsenic

Arsenic Concentrations mg/kg

- < 15
- 15 - 25
- 25 - 35
- 35 - 45
- 45 - 60
- 60 - 120
- > 120

## Estimated Soil Chemistry Arsenic - Slice A



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## Order Details

| | |
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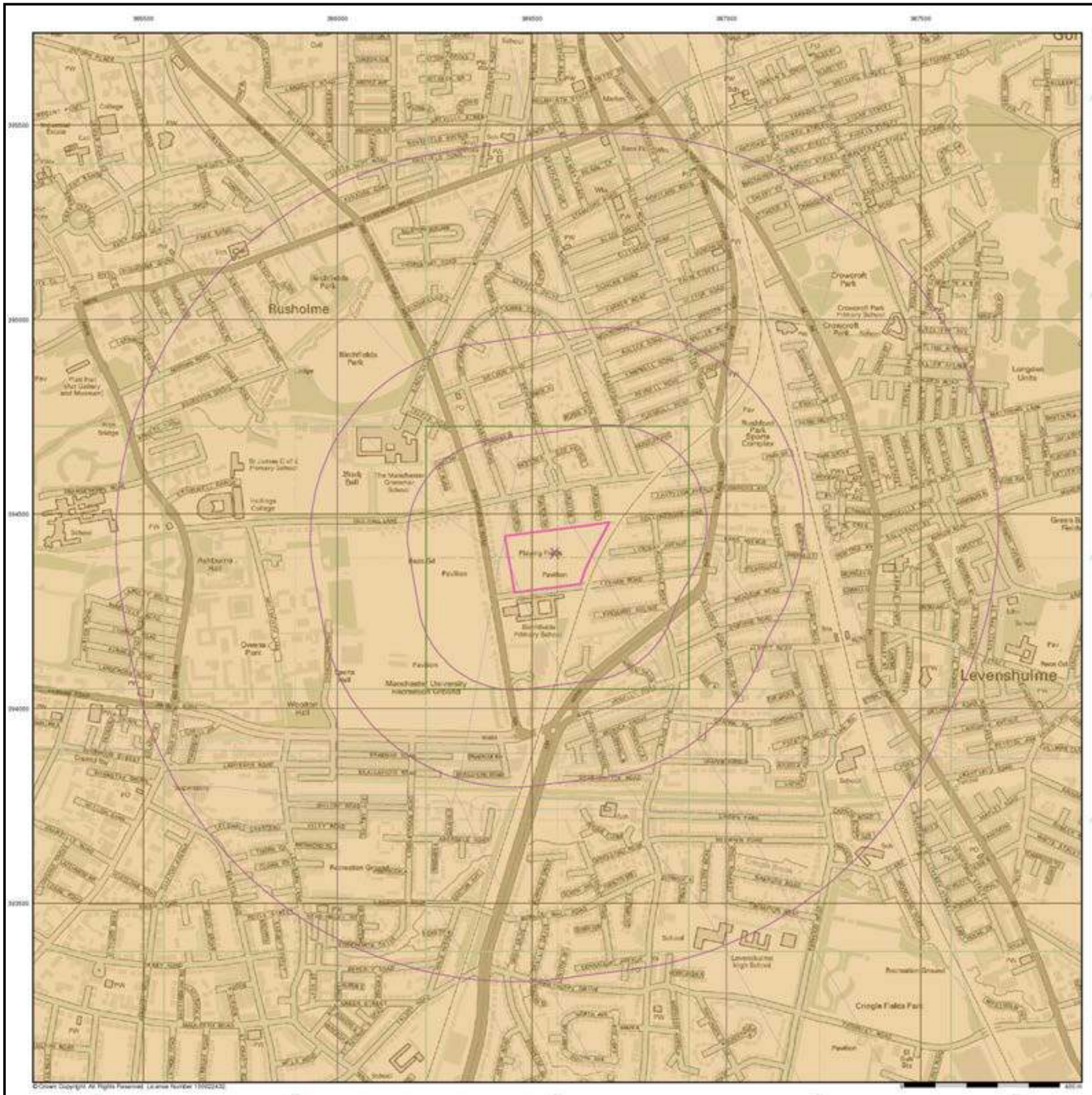
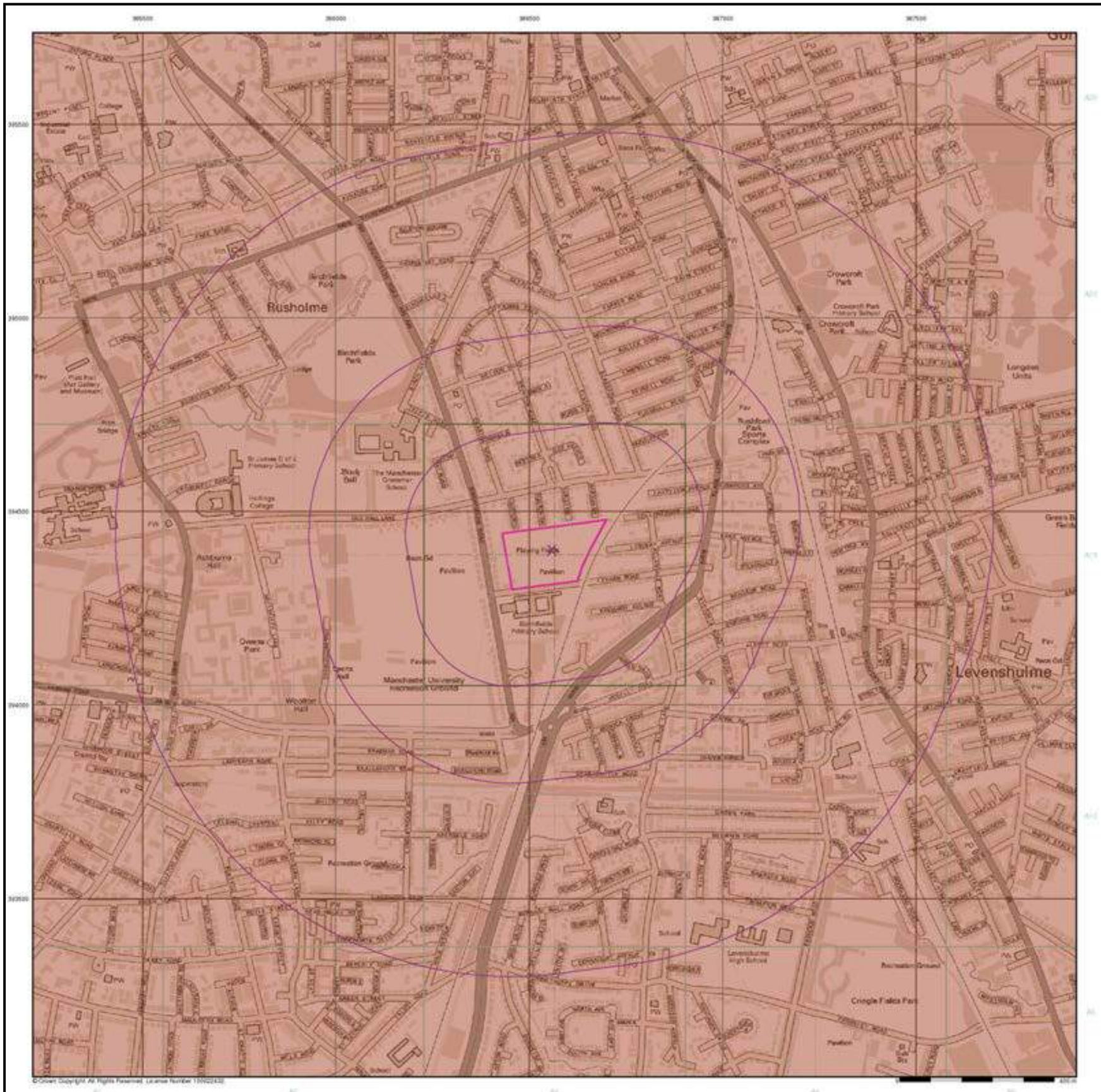

Rusholme
Levenshulme
Birchfields Park
Crowcroft Park
Ashburne Hall
Owens Park
Weaver Hall
Manchester University Recreation Ground
Pavilion
Pavilion
Pavilion
Pavilion
Recreation Ground
Recreation Ground
Cringle Fields Park
Longford Units
Rusholme Park Sports Complex
Levenshulme High School
Crowcroft Park Primary School
Birchfields Primary School
St James C of E Primary School
The Manchester Grammar School
Indigo College
Plant Pen Art Gallery and Museum
Mosque
Mosque
Sikh Gurdwara
Sikh Gurdwara
Sikh Gurdwara




RAMBOLL ENVIRON

## General

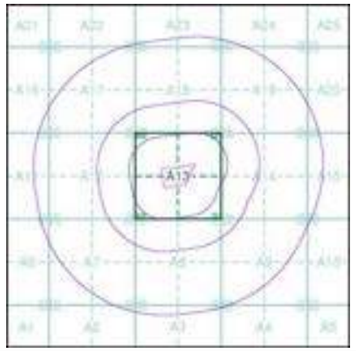
Specified Site  Specified Buffer(s)  Bearing Reference Point

## Estimated Soil Chemistry Chromium

Chromium Concentrations mg/kg

- < 20
- 20 - 40
- 40 - 60
- 60 - 90
- 90 - 120
- 120 - 180
- > 180

## Estimated Soil Chemistry Chromium - Slice A



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| Customer Ref: | 16200001457 |
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## Site Details

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Landmark Information Group

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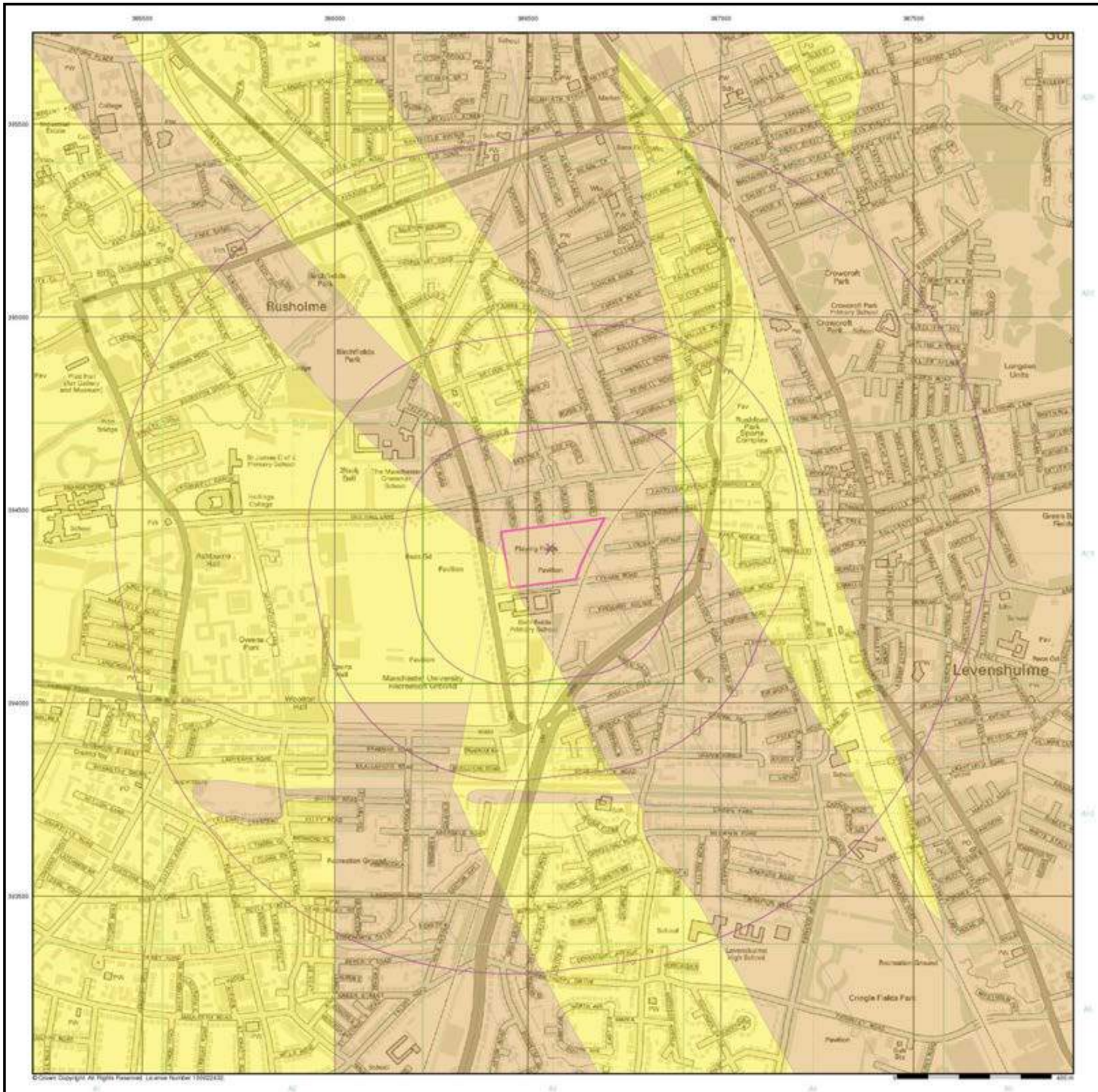
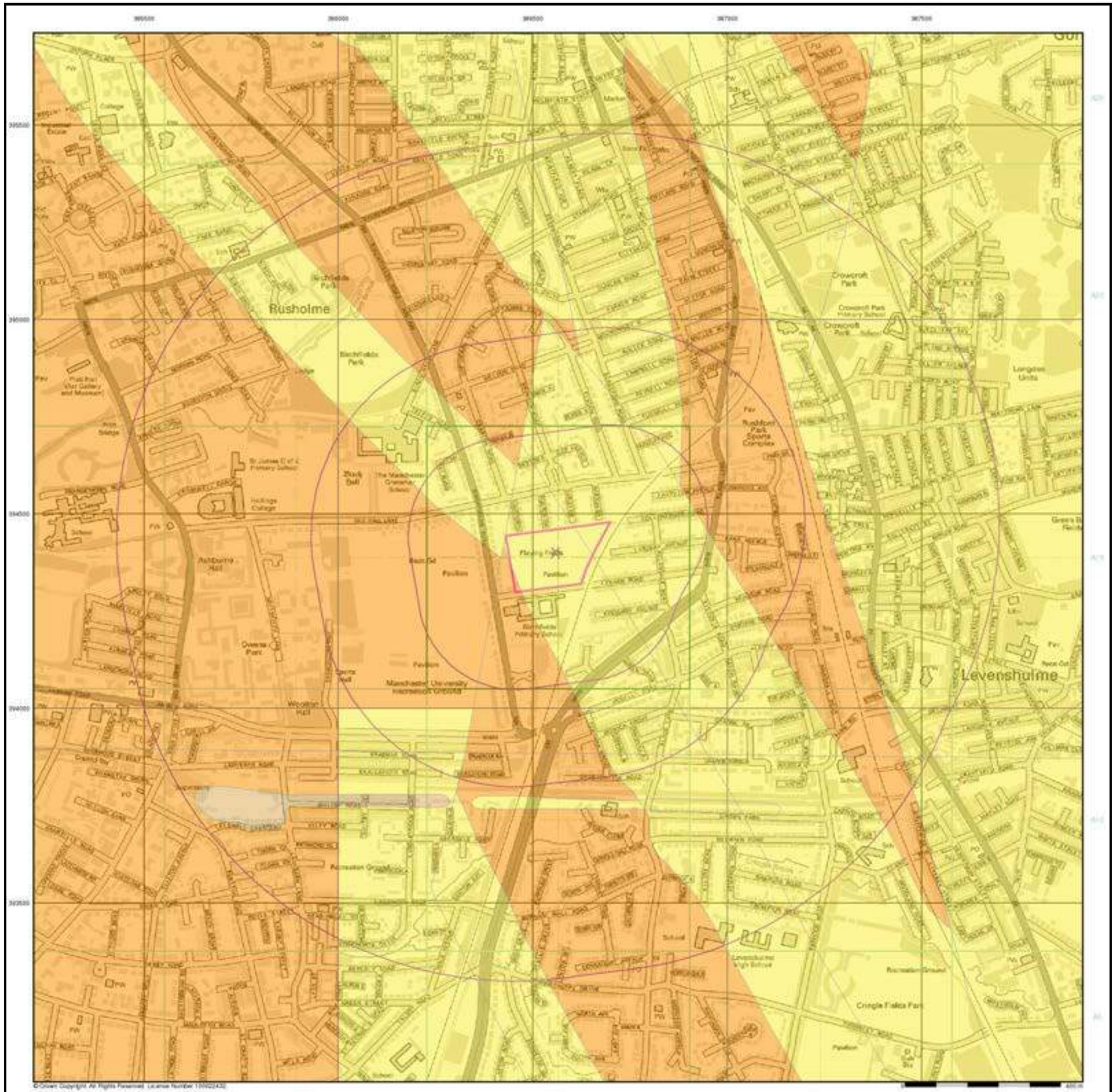
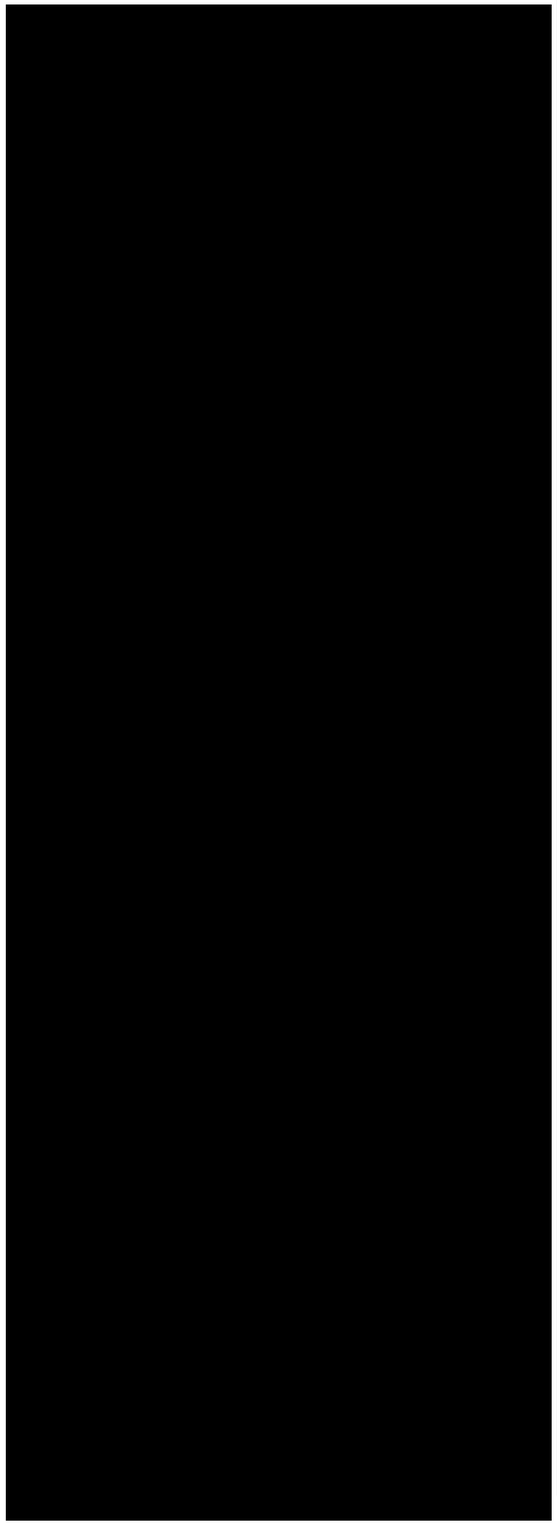

Rusholme
Levenshulme
Birchfields Park
Crowcroft Park
Ashburne Hall
Owens Park
Wilmslow Hall
Manchester University Recreation Grounds
Cringle Fields Park
Rusholme Park Square Complex
Longsight Units
Pavilion
Bowling Green
Tennis Courts
Recreation Ground
Pitch
Play Area
Sch
Church
Library
Fire Station
Post Office
Bridge
Subway
Path
Track
Cricket Pitch
Allotments
Car Park
Refuse Tip
Works
Tank
Mast
Weir
Lock
Sluice
Gate
Ford
Cutting
Embankment
Tunnel
Level Crossing
Boundary Stone
Milestone
Milepost
Spot Height
Trig Point
Benchmark
Flagpole
Fountain
Monument
Memorial
Statue
Cairn
Tumulus
Standing Stone
Rock
Scrub
Orchard
Wood
Coppice
Marsh
Reeds
Sand
Shingle
Glasshouse
Slope
Cliff
Quarry
Pit
Spoil Heap
Clay Pit
Gravel Pit
Sand Pit
Shaft
Adit
Mine
Mineral Line
Aqueduct
Viaduct
Pylon
Electricity Transmission Line
Telephone Line
Pipeline
Overhead Pipeline
Pumping Station
Sewage Works
Sewage Treatment Works
Reservoir
Water Tank
Water Tower
Windmill
Wind Turbine
Radio Mast
Radio Station
Transmitter
Telephone Exchange
Telephone Kiosk
Post Box
Post Office
Police Station
Fire Station
Ambulance Station
Hospital
Health Centre
Surgery
Clinic
Dispensary
Veterinary Surgery
Kennels
Cattery
Stables
Riding School
Livery Stables
Farm
Farmhouse
Farm Buildings
Barn
Dairy
Milking Parlour
Cowshed
Piggery
Poultry Farm
Hatchery
Granary
Mill
Maltings
Brewery
Distillery
Winery
Vineyard
Orchard
Nursery
Garden Centre
Market
Shop
Supermarket
Department Store
Shopping Centre
Bank
Building Society
Public House
Restaurant
Cafe
Hotel
Guest House
Youth Hostel
Camping Site
Caravan Site
Golf Course
Golf Club
Golf Driving Range
Golf Practice Ground
Golf Tee
Golf Green
Golf Bunker
Golf Hazard
Golf Water Hazard
Golf Fairway
Golf Rough
Golf Trees
Golf Shrubs
Golf Buildings
Golf Car Park
Golf Path
Golf Track
Golf Boundary
Golf Fence
Golf Wall
Golf Hedge
Golf Ditch
Golf Stream
Golf Pond
Golf Lake
Golf Reservoir
Golf Sand Trap
Golf Water Trap
Golf Grass

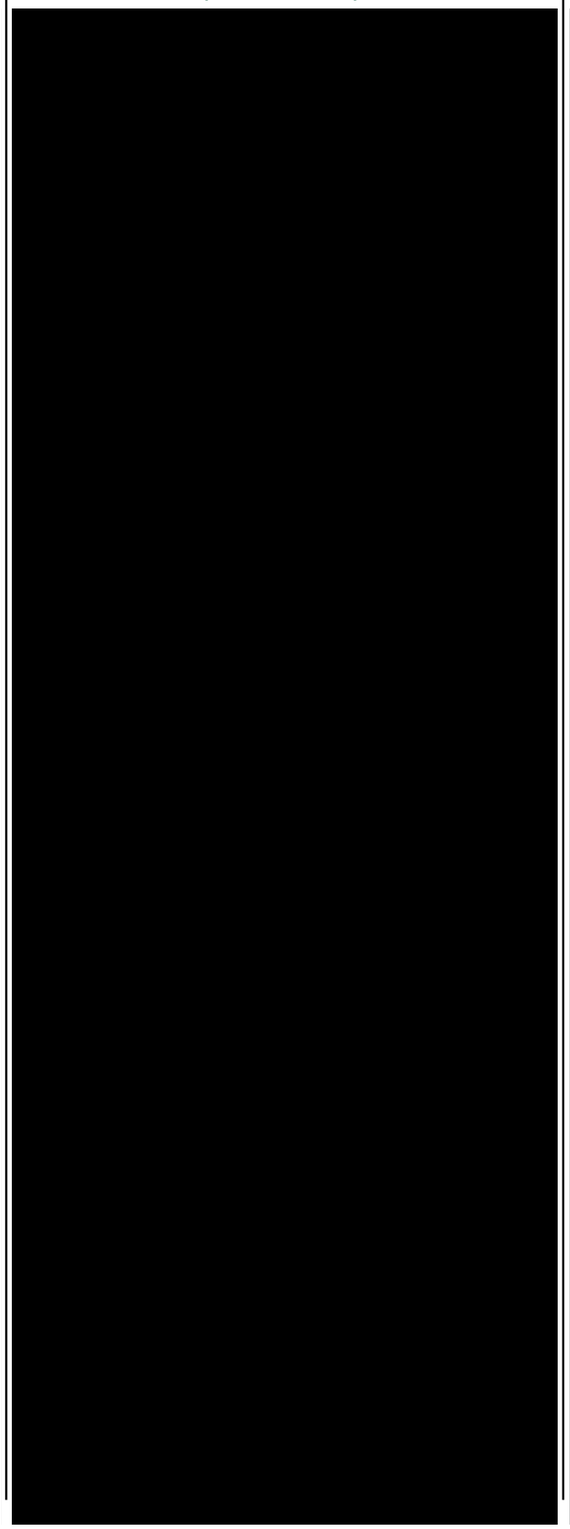

Rusholme
Levenshulme
Birchfields Park
Crowcroft Park
Platt Fields Park, Art Gallery and Museum
Ashbury Hall
Owens Park
Wright Hall
Pavilion
Manchester University Recreation Ground
Cringle Fields Park
Longford Units
Rushford Park Square Complex
Crowcroft Park Primary School
Levenshulme High School
Recreation Ground
Pavilion
Pavilion
Pavilion

# Historical Mapping Legends

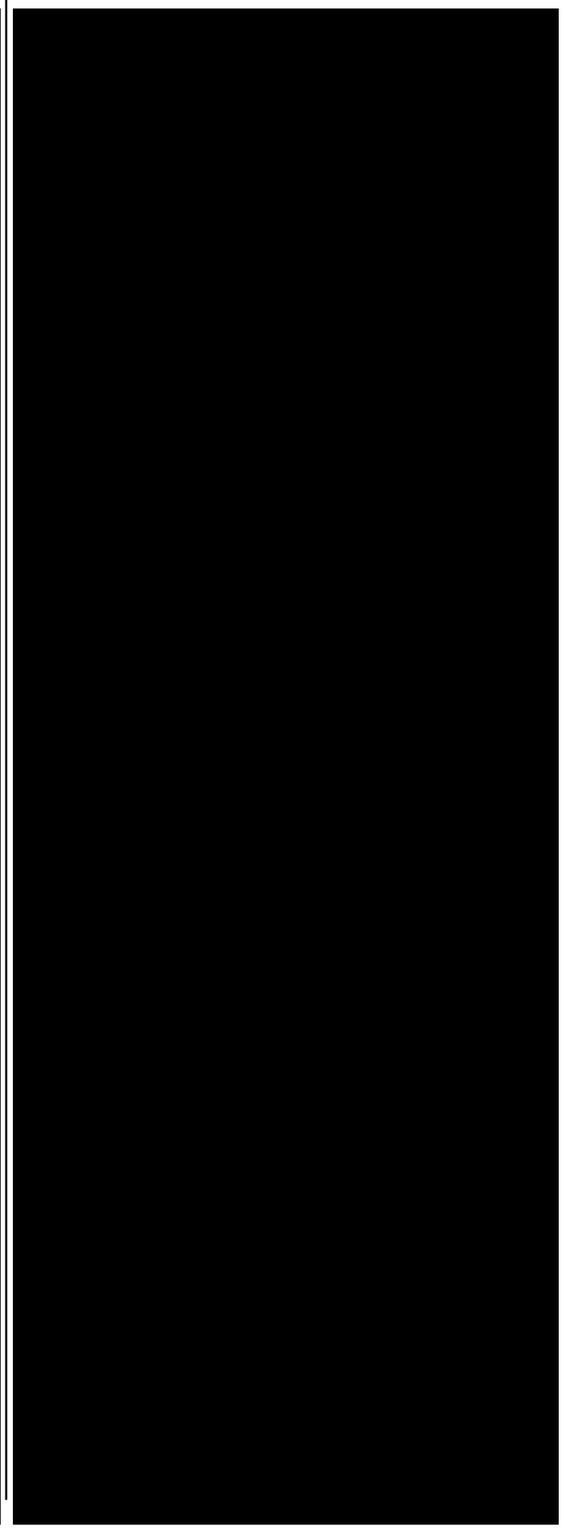
## Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



## Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



## Large-Scale National Grid Data 1:2,500 and 1:1,250

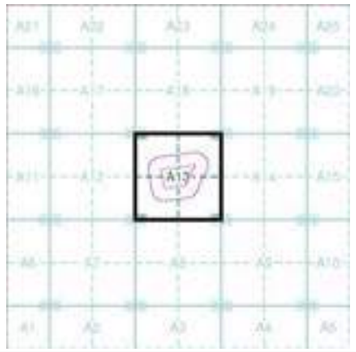


RAMBOLL ENVIRON

## Historical Mapping & Photography included:


| Mapping Type | Scale | Date | Pg |
|---|---|---|---|
| Lancashire And Furness | 1:2,500 | 1893 | 2 |
| Lancashire And Furness | 1:2,500 | 1907 | 3 |
| Lancashire And Furness | 1:2,500 | 1922 - 1933 | 4 |
| Lancashire And Furness | 1:2,500 | 1934 | 5 |
| Ordnance Survey Plan | 1:1,250 | 1957 | 6 |
| Ordnance Survey Plan | 1:2,500 | 1957 | 7 |
| Additional SIMs | 1:1,250 | 1957 - 1988 | 8 |
| Additional SIMs | 1:1,250 | 1984 | 9 |
| Large-Scale National Grid Data | 1:1,250 | 1992 | 10 |
| Large-Scale National Grid Data | 1:1,250 | 1995 | 11 |


## Historical Map - Segment A13




## Order Details

Order Number: 80427581_1_1
Customer Ref: 16200001457
National Grid Reference: 386560, 394400
Slice: A
Site Area (Ha): 3.21
Search Buffer (m): 100

## Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL


Landmark Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

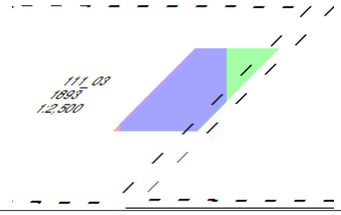
## Lancashire And Furness

## Published 1893

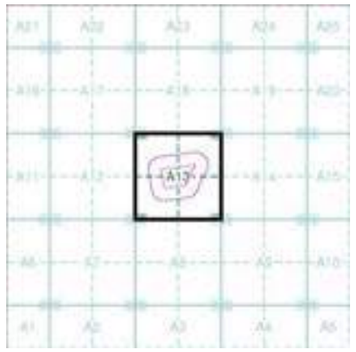
## Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

## Map Name(s) and Date(s)




## Historical Map - Segment A13




## Order Details

| | |
|---|---|
| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386560, 394400 |
| Slice: | A |
| Site Area (Ha): | 3.21 |
| Search Buffer (m): | 100 |

## Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

## Lancashire And Furness

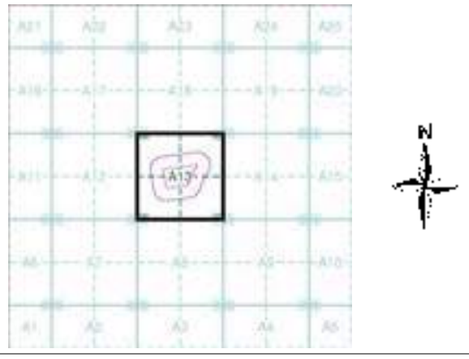
## Published 1907

## Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

## Map Name(s) and Date(s)

## Historical Map - Segment A13




## Order Details

| | |
|---|---|
| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386560, 394400 |
| Slice: | A |
| Site Area (Ha): | 3.21 |
| Search Buffer (m): | 100 |

## Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

Landmark Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

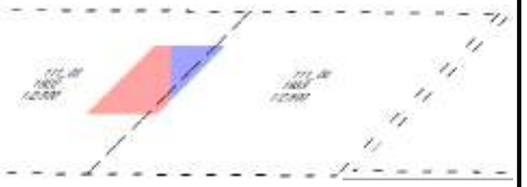
## Lancashire And Furness

**Published 1922 - 1933**

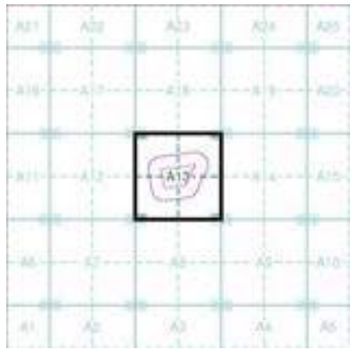
**Source map scale - 1:2,500**

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

## Map Name(s) and Date(s)



## Historical Map - Segment A13




## Order Details

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| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
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Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

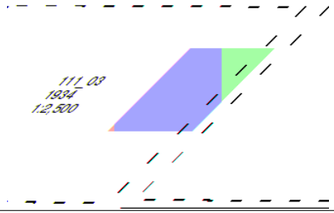
## Lancashire And Furness

## Published 1934

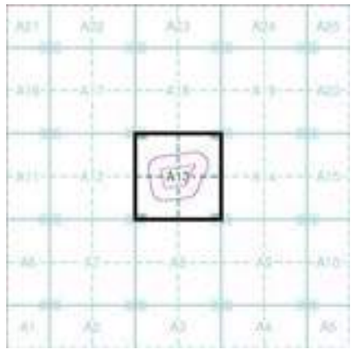
## Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

## Map Name(s) and Date(s)




## Historical Map - Segment A13

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Fax: 0844 844 9951
Web: www.envirocheck.co.uk

RAMBOLL ENVIRON

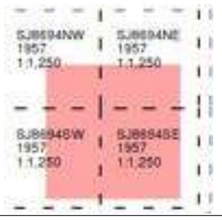
## Ordnance Survey Plan

## Published 1957

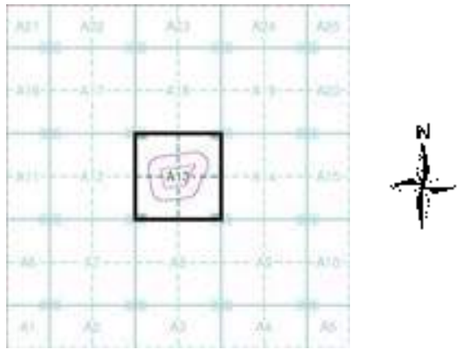
## Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

## Map Name(s) and Date(s)




## Historical Map - Segment A13

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Landmark Information Group

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RAMBOLL ENVIRON

## Ordnance Survey Plan

## Published 1957

## Source map scale - 1:2,500

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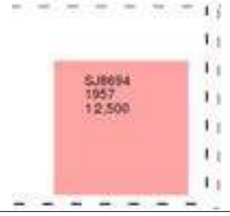
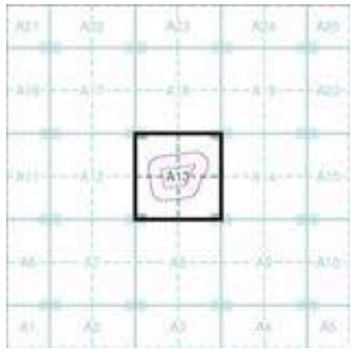
## Map Name(s) and Date(s)




## Historical Map - Segment A13

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Tel: 0844 844 9952
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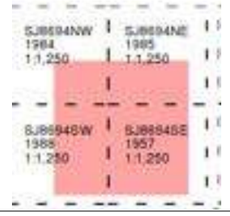
## Additional SIMs

**Published 1957 - 1988**

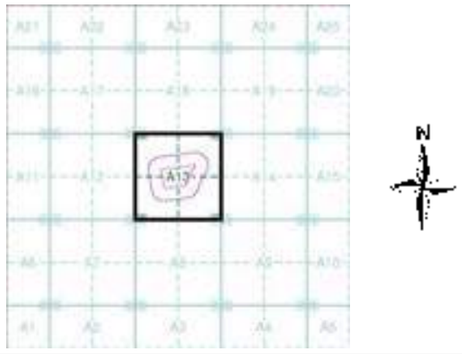
**Source map scale - 1:1,250**

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

## Map Name(s) and Date(s)




## Historical Map - Segment A13

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| Slice: | A |
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| Search Buffer (m): | 100 |

## Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

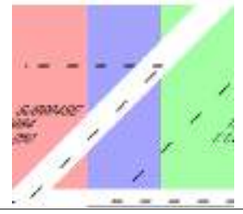
## Additional SIMs

**Published 1984**

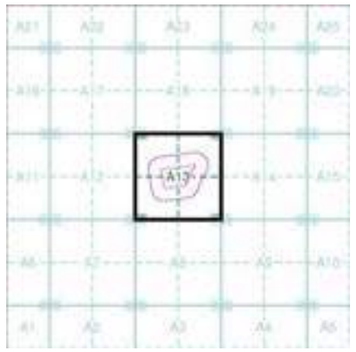
**Source map scale - 1:1,250**

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

## Map Name(s) and Date(s)



## Historical Map - Segment A13




## Order Details

| | |
|---|---|
| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386560, 394400 |
| Slice: | A |
| Site Area (Ha): | 3.21 |
| Search Buffer (m): | 100 |

## Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

RAMBOLL ENVIRON

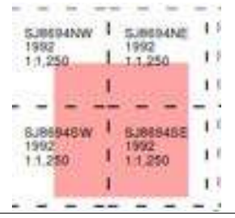
## Large-Scale National Grid Data

**Published 1992**

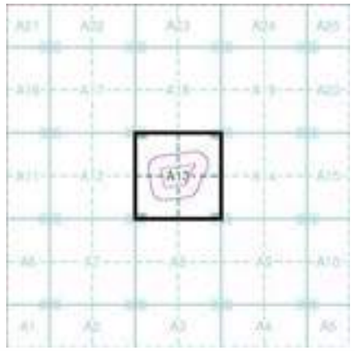
**Source map scale - 1:1,250**

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

## Map Name(s) and Date(s)




## Historical Map - Segment A13




## Order Details

| | |
|---|---|
| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386560, 394400 |
| Slice: | A |
| Site Area (Ha): | 3.21 |
| Search Buffer (m): | 100 |

## Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

RAMBOLL ENVIRON

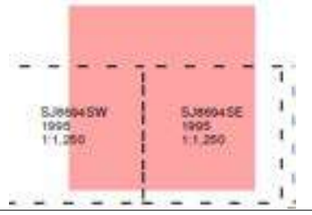
## Large-Scale National Grid Data

## Published 1995

## Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

## Map Name(s) and Date(s)




## Historical Map - Segment A13

## Order Details

| | |
|---|---|
| Order Number: | 80427581_1_1 |
| Customer Ref: | 16200001457 |
| National Grid Reference: | 386560, 394400 |
| Slice: | A |
| Site Area (Ha): | 3.21 |
| Search Buffer (m): | 100 |

## Site Details

Birchfields Primary School, Lytham Road, MANCHESTER, M14 6PL

Landmark Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

# APPENDIX C BGS BOREHOLE RECORDS

(21387) Wt. 17822—854—5,000 12/28 Gp. 166 O.A.

# SJ89 79 SE 17-9 1-3

3" G.S.M. Nos. 7 and 9 on sheet

SECTION OF Boreholes at Fallowfield, Manchester on Standard

Maps: One-inch 85 Six-inch 111 N.E.W. County Lancashire

Height above O.D. Latitude Longitude

Communicated by Manchester Corporation Date of Sinking

Made by Dip of Strata

| | | Thickness | | Depth from Surface. | | |
|---|---|---|---|---|---|---|
| No. 7 No. 3 on standard No. 32. 146.53 ft. O.D. 7 SJ 11 N.E.W. | In Moseley Road, near S.E. corner of Owen's College Athletic Ground | | | LEVENSHULME | | metres |
| | Soil | 2 | - | | 2 | -0.61 |
| | Soft red rock. | 25 | - | | 27 | -8.23 |
| No. 8 No. 2 on standard No. 30. 27.55 ft. O.D. 8 SJ 11 N.E.W. | Corner of Sherwood St. & Wilmslow Road. FALLOWFIELD. | | | | | |
| | Dark soil | 1 | - | | 1 | -0.30 |
| | Clay | 8 | - | | 9 | -2.74 |
| | Dark clay. | 5 | - | | 14 | -4.27 |
| | Soft red sand. | 3 | - | | 17 | -5.18 |
| | Hard light sand. (Water-level 24 ft.) | 8 | - | | 25 | -7.62 |
| | Soft red sandstone. | 12 | - | | 37 | -11.28 |
| No. 9 No. 33. 35.78 ft. O.D. No. 1 on standard 9 SJ 11 N.E.W. | Corner of Old Hall Lane and Wilmslow Road, FALLOWFIELD. | | | | | |
| | Made ground | 3 | - | | 3 | -0.91 |
| | Plastic clay. (Water-level 12 ft.) | 10 | - | | 13 | -3.96 |
| | Hard clay. | 3 | - | | 16 | -4.88 |
| | Hard red sand. | 5 | - | | 21 | -6.40 |
| | Hard light sand | 9 | - | | 30 | -9.14 |
| | Loamy red sand. | 13 | - | | 43 | -13.11 |

G.S.M. No. 12, 14, 15

(321467) Wt. 17382—854—5,000 12/26 Gp. 166. O.A.

SECTION OF Bowdales SJ 89 SE 14 20, 21 on standard 12 14

Maps: One-inch 95 Six-inch 111 N.E. County Lancs

Height above O.D. Latitude Longitude

Communicated by Manchester Corporation Date of Sinking

Made by Dip of Strata

| | Thickness. | | Depth from Surface. | | |
|---|---|---|---|---|---|
| | | | LEVENSHULME. | | |
| No. 12 on 1/2500 map. Exact position uncertain. No. 102. 172.61 ft. O.D. In Stockport Road 100 yds S. of corner with Chapel St. | | | metres | | |
| No 20 12 | Made ground | 1 – | 0.30 | 1 | – 030 |
| | Yellow clay | 3 2 | 1.27 | 4 | 2 |
| | Brown clay | 8 3 | 3.79 | 12 | 5 |
| 111 N.E. | Sandy brown clay | – 4 | 3.89 | 12 | 9 |
| | Stiff brown clay | 3 3 | 4.88 | 16 | – |
| | Stony clay. | 8 – | 7.32 | 24 | – |
| | Red sandy clay. | 3 – | 8.23 | 27 | – |
| | Sandy brown clay. | 12 6 | 12.04 | 39 | 6 |
| | Marly clay. | 3 6 | 13.11 | 43 | – |
| | Soft loamy clay. | 7 – | 15.24 | 50 | – |
| No 14 on 1/2500 map No. 31. 157.75 ft. O.D. Corner of Victoria Road & Albert Road. | | | LEVENSHULME. | | |
| No 14 | Soil & cinders. | 2 – | 0.61 | 2 | – |
| 111 N.E. | Yellow stony clay. | 3 – | 1.52 | 5 | – |
| | Yellow clay. | 9 – | 4.27 | 14 | – |
| No 13 on 1/2500 map No. 3 [illegible] 67 ft. O.D. In Stockport Road. 50 yds S. of corner with Slade Hall Road. | | | LEVENSHULME. | | |
| No 13 | Filled up stuff. | 3 – | 0.91 | 3 | – |
| 111 N.E. No 21. | Brown clay. | 14 6 | 5.33 | 17 | 6 |

# BOREHOLE LOG

GROUNDSHIRE

LOCATION 50-60 WINDSOR RD - LEVENSHULME

CLIENT MOSS CARE HOUSING LTD

BOREHOLE No. 2 DIAMETER 150mm

GROUND LEVEL: DATE: NOVEMBER 1988

Telephone: (091) 4161108/4179794

| Depth | Thickness | Legend | Description of Strata | Type of Sample | C kN/m² | M % | Ø | Density Kg/m³ | N |
|---|---|---|---|---|---|---|---|---|---|
| 0.20 | 0.20 | | SOIL | | | | | | |
| | 1.80 | | FAIRLY COMPACT CLAY + BRICK RUBBLE FILL | P 0.75 | | | | | 13 |
| | | | | P 1.50 | | | | | 22 |
| 2.00 | | | | | | | | | |
| | 0.50 | | FIRM BROWN & GREY BOULDER CLAY | | | | | | |
| 2.50 | | | | U 3.00 | 306.0 | 12.0 | - | 2250 | |
| | 2.50 | | FIRM TO STIFF BROWN BOULDER CLAY | | | | | | |
| | | | | U 4.50 | 261.0 | 12.0 | - | 2300 | |
| 5.00 | | | | | | | | | |

Water Struck at NIL Standing Water Level

# APPENDIX D ROBSON LIDDLE 2015 GROUND INVESTIGATION REPORT

Robson Liddle

part of the nps group

# Lytham Road
# Manchester

## Ground Investigation Report

On behalf of Manchester City Council

Report 12-12-16-1-1163/GIR1
December 2015

• Structures • Civil and Infrastructure • Geotechnical & Geo-environmental

# Report Issue Record

| | |
|---|---|
| Project No.: | 12-12-16-1-1163 |
| Project Title: | Lytham Road |
| Site Location: | Manchester |
| Client: | Manchester City Council |
| Report Title: | Ground Investigation Report |
| Issue Date: | 03 December 2015 |
| Report No.: | 12-12-16-1-1163/GIR1 |
| Revision: | - |

| | Written | Reviewed | Approved |
|---|---|---|---|
| Name | **Catherine Riley** BEng, BSc, CEng, CEnv, MCIWEM | **Tim Thornburn** BSc(Hons), PgDip | **Craig Roberts** BSc, FIEnvSc, CEnv |
| Signature | | | |
| Position | Senior Geo-Environmental Engineer | Senior Geotechnical Engineer | Associate Director |

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| | | |
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| F | Chemical Test Certificates |
| G | Statistical Analysis - Inputs and Outputs |

# Executive Summary

| SITE INFORMATION | |
|---|---|
| Client | Manchester City Council. |
| Site | Lytham Road |
| Location | Manchester, M14 6PL. NGR 386550, 394385. |
| Approximate area | 3.25 hectares. |
| Topography | Essentially flat and level. |
| Current land use | Playing field. |
| Proposed development | New 7,500m$^2$ secondary school. |

| SITE SETTING | |
|---|---|
| Geology | Glacial Till over bedrock geology of the Halesowen Formation (mudstone, siltstone and sandstone). |
| Hydrogeology | Glacial Till – Unproductive<br>Hawesowen Formation - Secondary Aquifer. |
| Hydrology | No surface water within 250m of the site. |
| History | Site has been used as playing field for more than 80 years by Manchester University; the 1932 mapping indicates a athletics field changing to playing field in the 1940s. . Prior to this it is understood that the land was undeveloped. A small pavilion was constructed on the south west corner with three tennis courts bounding the west of the site in the 1930s, an additional pavilion was constructed in the south east corner in the late 1970s which was demolished in the 2000s. |

| INVESTIGATION | |
|---|---|
| Previous site investigations | Phase 1 Desk Study Report by Robson Liddle (ref 12-12-16-1-1163/DSR1 dated 18 August 2015). |
| This site Investigation | Six windowless sampler boreholes to 4.00m bgl with 3 x 50mm standpipes & gas valves. Machine excavated trial pits with infiltration testing to 1.6 to 3.0m bgl. 3no Cable percussion boreholes to 11.5 m bgl. |
| Monitoring | Six gas and groundwater level monitoring visits, three completed at this stage. |
| Ground conditions | Thin topsoil Made Ground (0.25m to 0.45m) over firm to stiff becoming very stiff to hard gravelly clays to 8.00 and 11.50m, over mudstone bedrock. Localised Made Ground present in the vicinity of the former tennis courts and in the location of TP5 & WS9. No groundwater during investigation. During monitoring in October and November 2015 groundwater levels ranged from 0.18m and 1.58m bgl. |

| GEOTECHNICAL | |
|---|---|
| Foundations | Conventional spread foundations should be taken down through any Topsoil, Made Ground or soft deposits and constructed within the stiff clays at a minimum depth of 0.90m bgl. The assessment has indicated a conservative undrained shear strength of 65kPa in the Glacial Till. This value would provide a bearing capacity of 130kPa for strip foundations or 150kPa for square pads, in order to limit settlements to no more than 25mm. At a depth of 2.00m bgl the safe bearing capacity increases to 200kPa. Where the proposed loads are too high for practical or economical construction of shallow foundations, piled foundations can offer a suitable alternative solution. |
| Shrinkable soils | Soils medium volume change potential. |
| Buried concrete | DS1 & AC1. |
| Floor slabs | Suspended floors recommended. |
| Gas protection | Monitoring to date indicated no gas protection measures are likely to be required, however further monitoring is required to confirm.<br>No radon protection measures required. |
| Slope stability | Soils are considered generally stable and relatively steep cuts can be made, but careful assessment of changes of elevation or construction near existing slopes would still be needed. |
| Pavement | Design CBR 3%. |
| Soakaways | BRE infiltration testing in 2 TPs suggest infiltrations rates are likely to be less than $1x10^{-6}$m/s. |
| Natural cavities | None expected. |
| Mining | None expected. |

| CONTAMINATION | |
|---|---|
| Human health | The GQRA has identified concentrations of PAHs exceeding the applied assessment criteria within the Topsoil. Localised exceedance has also been recorded in the shallow Made Ground in WS9. The concentrations present have the potential to pose a risk to future users. |
| Controlled waters | No risks identified. |
| Water supply pipes | Localised elevated concentrations of hydrocarbons have been encountered, which may have the potential to attack plastics. Confirmation should be sought from the water supply company at the earliest opportunity as to their specific requirements. |
| Further Works Including Remedial Actions | Based on the findings of the GQRA, we recommend supplemental investigation and assessment to profile the contamination within topsoil in the areas where soft landscaping is proposed. This in conjunction with more detailed quantitative risk assessment (DQRA) may minimise the remedial required, it is unlikely however that these works would remove the requirement for remediation. Following completion and in accordance with industry best practice and guidance the following will be required to be completed, i) a detailed remedial options appraisal, ii) a remedial strategy and specification iii) implementation, monitoring and validation to ensure remedial goals are achieved. The above works would be required to be agreed with the statutory regulators.<br><br>Remedial actions may include a combination of: screening of soils; soil treatment (e.g. bio-remediation/thermal treatment/soil washing), reuse of treated material where appropriate, removal of chemically unstable materials from site or design and Installation of a cover system. |

# 1 Introduction

In August 2015 Robson Liddle Ltd (RLL) was commissioned by Manchester City Council to undertake a ground investigation at Lytham Road, Manchester.

It is understood that the site is being considered for the development of a new 7500m$^2$ secondary school. A preliminary development layout sketch has been provided by Manchester City Council and is presented as Drawing No 12-12-16-1-1163/D01 in Appendix A. The development may include a four story high classroom block and a single storey gymnasium.

This report describes the work undertaken and presents the data obtained together with an evaluation of their significance in relation to the proposed works.

## 1.1 Project Requirements and Scope of Works

The objectives of the investigation were to:

- Develop a ground model for the site.
- Quantitatively assess the potential nature and extent of contamination from those uses and the environmental risks and liabilities which may be posed to the identified receptors (human health and the environment).
- Assess any potential geotechnical risks.
- Provide geotechnical recommendations to assist in construction design.

To address these objectives Robson Liddle proposed the following scope of works:

- An intrusive ground investigation consisting of dynamic sampler boreholes, trial pits, cable percussion boreholes, groundwater and gas monitoring and laboratory chemical and geotechnical testing.
- Reporting on findings of the ground investigation and presentation of results.
- Geotechnical recommendations in relation to the proposed development.
- Geo-environmental assessment and interpretation of the ground, ground gas and groundwater conditions.

## 1.2 Information Sources

During the production of this report the following sources have been reviewed:

- Historic Ordnance Survey maps.
- British Geological Survey Maps.
- British Geological Survey website.
- Environment Agency landfill records.
- Environment Agency groundwater data.
- BRE 211 “Guidance on protective measures for new buildings” 2007.

## 1.3 Previous Investigations

A Preliminary Land Contamination and Geotechnical Risk Assessment for the site has been undertaken by Robson Liddle Ltd in August 2015 (report reference 12-12-16-1-1163/DSR1).

During the production of this report the information in that report has been reviewed and a summary of its findings is described in Section 4.

# 2 Site Location

Address: Lytham Road, Fallowfields, Manchester.

Post Code: M14 6PL.

National Grid Reference: 386550, 394385.

The site is located off Lytham Road in the Fallowfield district of Manchester, approximately 4.8km south east of Manchester city centre as shown on Figure 1.

Full details of the sites features and land use area presented in Section 3

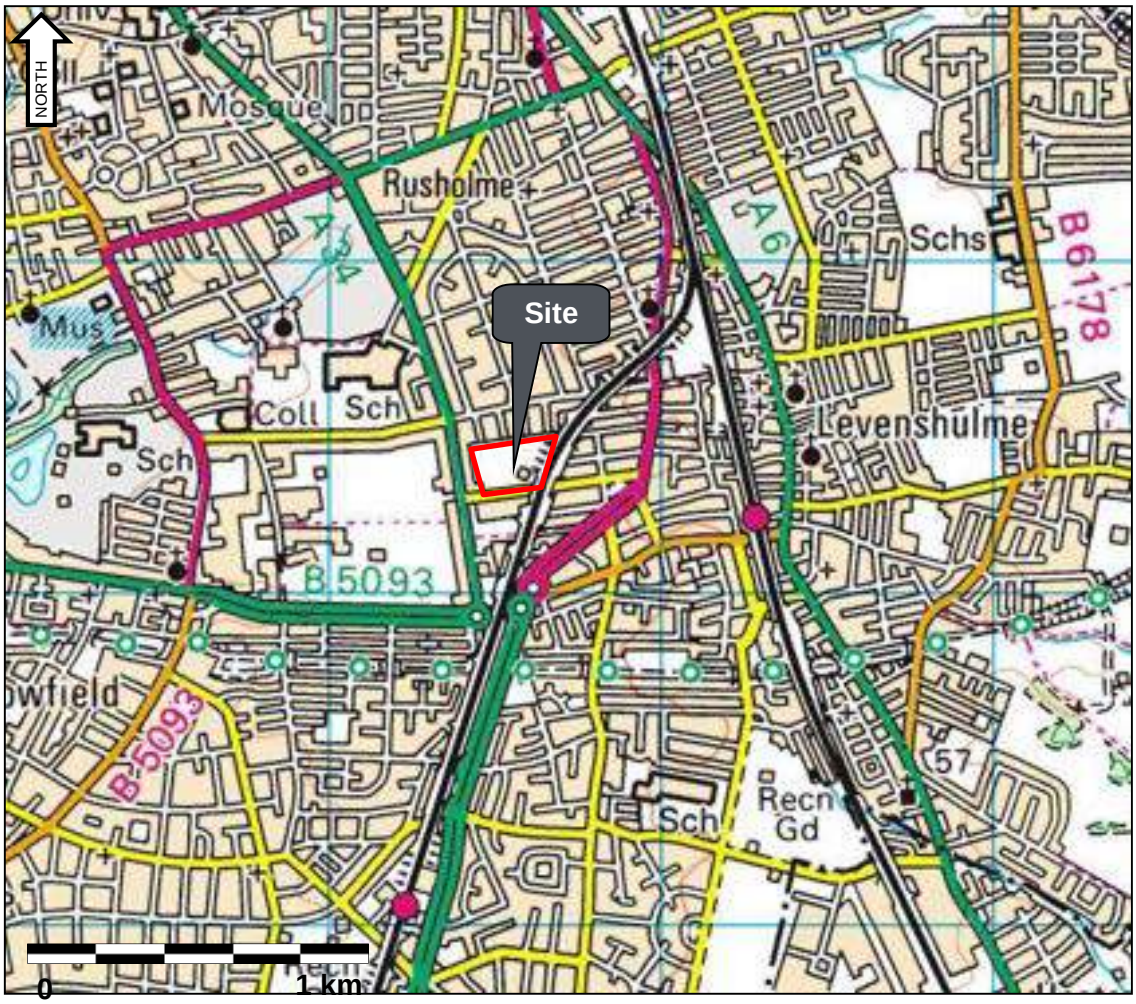



Figure 1 Site Location Plan

# 3 Site Description

A site walkover survey was undertaken on 18th August 2015 by Robson Liddle Ltd.

The site covers an area of approximately 3.25 hectares and is relatively flat in topography and roughly rectangular in shape. The playing field itself does not appear to be frequently used. The main area appears to be mowed on a semi regular basis however the edges of the site have become overgrown with several semi-mature self seeded trees and shrubs located along the perimeter. The only access into the site is via a gate in the south west corner off Lytham Road.

A series of hard surface tennis courts are located along the western boundary, these are no longer clearly defined as this portion of the site is overgrown. Fly tipping was recorded in a number of locations within this portion of the site, in the area of the tennis courts. There are three small garages / buildings located to the south west of the site which are all in poor condition. Access was not available into the buildings.

The pavilion which was recorded in the historical OS plans in the south east of the site has been demolished however the concrete floor slab and tarmacked driveway have been left in situ.

The site is securely fenced off with a mix of with wire mesh, palisade and domestic timber panels in evidence in various locations. A former damaged fence panel to the south west corner of the site which had previously allowed unofficial access to the site has been replaced. There are no signs of unofficial footpaths or field footpaths crossing the site.

A telecom mast located on the eastern boundary of the site immediately north of the former pavilion. We understand that title information indicates the presence of an easement adjacent to the railway for these masts which are accessed via the gate in the south east corner of the site near the former pavilion.

## 3.1 Surrounding Land-Use

The site is bounded to the north and west by residential premises. To the east lies the railway line with residential properties beyond. Lytham Road lies to the south of the site with Birchfields Primary School beyond. Figure 2 shows the site setting.

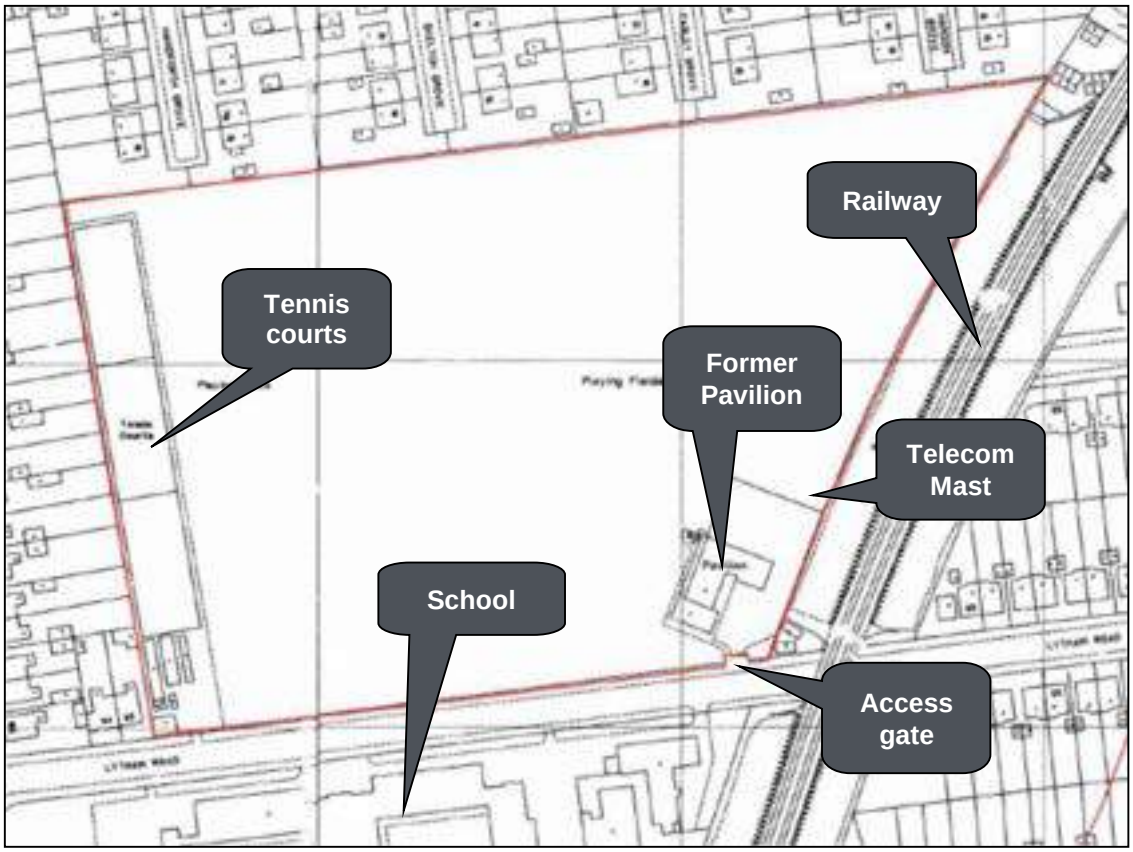
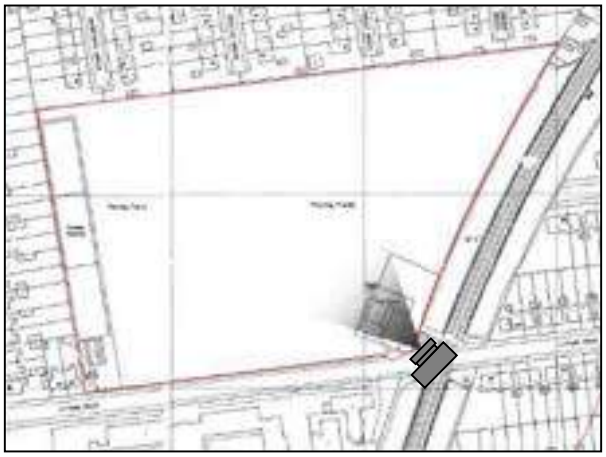



Figure 2 Site Setting

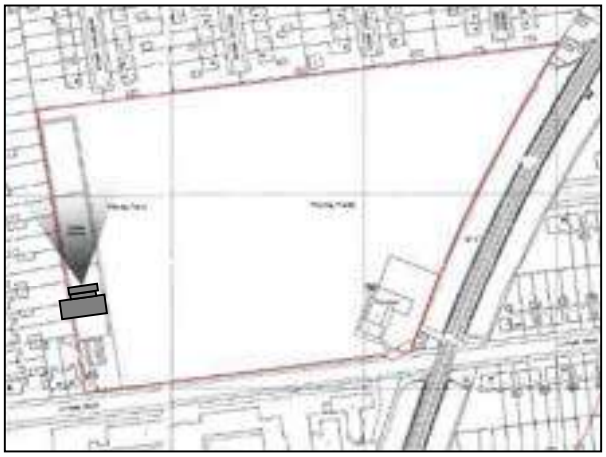
## 3.2 Photographs

Photograph 1 Looking from the entrance in the south east corner of the site towards the telecom mast.

Photograph 2 The former pavilion area, looking north west.



Photograph 3 The former tennis court area, looking north.



Photograph 4 Fly tipping adjacent to the western boundary.

# 4 Summary of Previous Work

A Preliminary Land Contamination and Geotechnical Risk Assessment for the site was completed by Robson Liddle Ltd in August 2014 (report reference 12-12-16-1-1136/DSR1).

A summary of the salient findings of that report is presented below.

Information published by the British Geological Survey indicated that the site is expected to be principally underlain by Halesowen Formation. The Halesowen Formation is described by the BGS as "Grey-green, micaceous sandstone (litharenite), and grey-green mudstone, with thin coals and limestone beds known as the 'Spirobis' limestone, with local intraformational conglomerate, strata may be reddened, locally". The mudstone is anticipated to be weathered to firm and stiff clay in the upper parts. Superficial deposits comprising Glacial Till may overlie the Halesowen Formation.

The Etruria Formation (sandstone and mudstone) outcrop in the north eastern corner of the site, which are described as "*Red, purple, brown, ochreous, green, grey and commonly mottled mudstone, with lenticular sandstones and conglomerates*". The Collyhurst Sandstone Formation is present immediately south west of the site.

The site has been used as playing field for more than 80 years by Manchester University. The 1932 mapping shows the site to be an athletics field changing to a playing field by the 1940s. Prior to this it is understood that the land was undeveloped and part of agricultural farmland or scrub. A small pavilion was constructed on the south west corner along with three tennis courts bounding the west of the site in the 1930s, an additional pavilion was constructed in the south east corner in the late 1970s. These buildings have subsequently been demolished.

No current or former landfill sites are located within 1km of the site and no deep Made Ground or organic soils are anticipated, consequently the risks from ground gas are considered to be low.

Based on the anticipated ground conditions, no abnormal geotechnical risks are expected. The proposed structures are two to four storey school buildings, the latter may impose fairly high loads due to the height and expected spans between load bearing elements. For low rise structures conventional spread foundations should be suitable. However, where larger structures impose column loads then pad sizes may

be excessive and piled foundations could be more economical. Ground bearing capacity would be confirmed following the intrusive Phase 2 Investigation.

The near surface soils are anticipated to be shrinkable however there are no existing trees in the area of the proposed development and based on the site's previous use as a playing field, felled trees are unlikely. A ground floor slab may be suitable provided the ground conditions are as anticipated and no significant desiccation or soft areas are present.

The site has remained essentially undeveloped, with its only former use being as a sports ground. No evidence of any potentially contaminative substances or processes has been identified. Consequently the site is considered to be of low risk with regards to soil or groundwater contamination.

# 5 Ground Investigation

The intrusive investigation was proposed by Robson Liddle, to meet the specification provided by Manchester City Council, and comprised the following

- Three cable percussion boreholes
- Eight machine dug trial pits
- Nine windowless sampler boreholes with a dynamic probe hole undertaken adjacent to each borehole.
- One additional dynamic borehole.
- BRE compliant Infiltration testing was undertaken in selected trial pits.

The positions of the exploratory holes were intended to provide a reasonable coverage of the site for an assessment of general site ground conditions as well as to target the footprint of the proposed building.

The procedures followed in this site investigation are based on BS 5930:1999 + Annex 2:2010 - Code of Practice for Site Investigations. The soils and rocks encountered have been described in accordance with BS5930:1999 + Annex 2:2010 and BS EN ISO 14688-1:2002 and BS EN ISO 14689-1:2003.

The approximate positions of the exploratory holes are shown on the Exploratory Hole Location Plan 12-12-16-1-1163/D02 in Appendix B and the exploratory hole records are included in Appendix C.

## 5.1 Trial Pits

Eight trial pits (numbered TP1 to TP8) were excavated to depths varying between 1.60m and 3.00m below ground level (bgl) using a wheeled backhoe excavator.

The profiles of strata or other features were recorded as excavation proceeded and measurements taken from ground level. Representative samples were taken, where appropriate, for laboratory analysis. At depths in excess of 1.20m below ground level or in unstable conditions, samples were taken directly from excavated materials deposited at surface. Detailed descriptions of the strata encountered, groundwater observations and excavation stability notes, together with any other pertinent information observed, are included on the trial pit records, which are included in Appendix C.

## 5.2 BRE Infiltration Testing

In order to determine the permeability of the ground to assess the suitability of soakaways for drainage at the site, BRE compliant infiltration was undertaken in two of the machine excavated trial pit (TP1 and TP7) on 14 October 2015.

The pit was partially filled with water with the rate of inflow sufficiently rapid so that the pit was filled in a short time. The rate of dissipation was then monitored to obtain a plot of water level over time.

Variations in soil conditions, areas of filled land, preferential underground seepage routes, variations in the level of groundwater and any geological factors likely to affect the long-term percolation and stability of the area surrounding the soakaway were assessed.

The results of the soakaway testing are presented in Appendix D.

## 5.3 Windowless Sampler Boreholes

Nine boreholes (WS1 to WS7 and WS9) were formed to depths of between 2.60m and 4.00 m on 15 and 16 October 2015 using windowless sampling techniques in order to obtain samples for laboratory testing and to provide geotechnical information for foundation design.

Representative disturbed small (1kg) and environmental (identified on the borehole logs as D and ES) samples of the soils encountered were obtained at regular intervals.

Standard Penetration Tests (SPTs) were carried out at metre intervals using either a split spoon sampler or a solid 60° cone. The results of these tests are given as a Standard Penetration “N” value or as a blow count for a given penetration on the borehole logs.

A detailed description of all strata and groundwater encountered, samples, in situ tests and other pertinent information observed are included on the borehole logs in Appendix C.

## 5.4 Dynamic Probing

Ten Dynamic Probe Holes (DP1 to DP10) were undertaken adjacent to the corresponding windowless sampler boreholes using super-heavy dynamic probe

equipment. The dynamic probe apparatus conforms to BS 1377 (1990) Part 9 and effectively drives a 90º (sacrificial) cone into the ground using a 63.5kg automatic trip hammer falling over 750mm. The number of blows required to achieve increments of 100mm penetration is recorded and plotted graphically on the records, which are presented in Appendix C.

## 5.5 Cable Percussive Boreholes

Three cable percussive boreholes were formed to depths of between 9.00m and 11.50m using conventional light cable percussive techniques in order to obtain samples for laboratory testing and to provide geotechnical information for piled foundation design.

Representative disturbed small (1kg) and bulk (15kg) (identified on the borehole logs as D and B) and 102mm diameter (identified on the borehole logs as U100) samples of the soils encountered were obtained at regular intervals. At alternate intervals with the U100 samples, Standard Penetration Tests (SPTs) were carried out using either a split spoon sampler or a solid 60° cone. The results of these tests are given as a Standard Penetration "N" value or as a blow count for a given penetration at the appropriate position on the borehole logs.

On encountering groundwater, drilling was suspended for 20 minutes in order to record any rise in water level. Full details of groundwater observations during site work are included on the borehole records.

A detailed description of all strata and groundwater encountered, samples, in situ tests and other pertinent information observed are included on the borehole logs in Appendix C.

## 5.6 Installations

Gas / Groundwater monitoring wells designed to allow monitoring of ground gases and shallow groundwater within the superficial deposits were installed into three of the six exploratory holes on completion, as detailed in Table 1.

The response zone comprised slotted pipe with a 10mm inert gravel surround. The strata above the response zone were sealed with bentonite. Installation details for the monitoring wells are also shown in the relevant borehole logs in Appendix C.

**Table 1 Summary of Monitoring Installations**

| Hole | Base (m bgl) | Dia. (mm) | Response Zone (m bgl) | Headworks |
|---|---|---|---|---|
| WS4 | 2.60 | 50 | 0.5 to 2.6 | Gas valve, flush locked cover |
| WS6 | 3.00 | 50 | 0.8 to 3.0 | Gas valve, flush locked cover |
| WS9 | 3.00 | 50 | 0.8 to 3.0 | Gas valve, flush locked cover |

All remaining exploratory holes were backfilled with arisings and the ground surface reinstated.

# 6 Laboratory Testing

## 6.1 General

All laboratory testing was scheduled by RLL and is summarised as follows:

## 6.2 Geotechnical Testing

Samples of soil retained from the exploratory holes were scheduled for geotechnical laboratory testing. The geotechnical analysis was carried out in accordance with BS1377: 1990 'Soils for Civil Engineering Purposes'. The following tests were carried out on selected samples:

- 15 natural moisture contents and Atterberg Limits
- Nine quick undrained triaxial tests
- Five 2.5kg compaction tests
- Four BRE SD1 sulphate suites

The results are presented in Appendix E. The BRE test results are included on the chemical test certificate in Appendix F.

## 6.3 Contamination Testing

Twenty samples of soils were retained from the exploratory holes and were scheduled for chemical laboratory testing. The soil samples were analysed for a combination of the following:

| | |
|---|---|
| Arsenic | Selenium |
| Boron (water soluble) | Zinc |
| Cadmium | pH |
| Chromium (total and VI) | Total Organic Carbon |
| Copper | Phenols |
| Lead | PAH (USEPA 16) |
| Mercury | TPH (CWG) |
| Nickel | Asbestos screen |

Three of the chemical samples were chosen and subject to NRA leachate testing.

The chemical analysis was undertaken by MCERTS and UKAS accredited laboratory i2 Analytical. Certificates of analysis are included Appendix F.

# 7 Ground Conditions

## 7.1 General

The results of this investigation were consistent with the anticipated geology. A summary of the strata encountered is presented in Table 2 and 3, overleaf and summarised in the sections 7.2 to 7.7. For full details of the strata encountered reference should be made to the exploratory hole logs in Appendix C.

## 7.2 Hardstanding

Hardstanding comprising bitumen surfacing was encountered in three of the exploratory holes (WS1, WS2 and TP2). These exploratory holes were located within the area of the former tennis courts.

## 7.3 Topsoil

Topsoil was encountered in the remainder of the exploratory holes to between 0.25 and 0.45m below ground level (bgl). The material consisted of dark brown clay with many rootlets.

## 7.4 Made Ground

Made Ground materials were encountered in five exploratory hole to depths ranging from 0.45m to 1.90m bgl. Two types of Made Ground have been recorded across the site, these are as follows

In WS1, WS2 and TP2 the Made Ground materials comprised principally black fine to medium gravel of clinker, coal, tarmac and sandstone. Localised bands of gravel comprising red shale was also recorded in these exploratory holes.

In TP5 and WS9 the Made Ground of comprises dark brown medium to coarse gravel of sandstone, ceramic, glass, brick and other mixed lithologies. In TP5 the Made Ground extended to 1.60m bgl, a brown fibrous peaty material extended from 1.6 to 1.9m bgl, this material may have been a made ground material rather than a naturally occurring peat. This material was also encountered in the eastern end of TP5a.

In WS9 a thin (100mm) of Made Ground was encountered extended from 0.4 m bgl to 0.5m bgl.

## 7.5 Glacial Till

The topsoil and Made Ground were underlain by the superficial geology of the Glacial Till. This material comprised firm to stiff sandy gravelly clayey sand and gravely clay typically encountered at depths of 0.20m to 0.90m bgl. In TP5 and TP5a the depth to this strata was not proven beneath the Made Ground.

The Glacial Till was proven to depths between 1.80 and 3.00m bgl.

**Table 2 Ground Conditions - Windowless Sampler Boreholes**

| Stratum | Depth to top (m bgl) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | WS1 | WS2 | WS3 | WS4 | WS5 | WS6 | WS7 | WS9 | WS10 |
| Topsoil | - | - | 0.40 | 0.30 | 0.25 | 0.20 | 0.40 | 0.40 | 0.35 |
| Made Ground | 0.50 | 0.45 | - | - | - | - | 0.90 | 0.50 | - |
| Firm to stiff sandy gravelly clay | 2.40 | 2.00 | 2.10 | 2.00 | 1.80 | 2.00 | 3.00* | 1.80 | 2.20 |
| Very stiff to hard slightly sandy gravelly clay | 4.00* | 4.00* | 3.00* | 2.60* | 3.00* | 3.00* | - | 3.00* | 3.00* |
| Groundwater | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |

*base of hole

**Table 3 Ground Conditions - Trial Pits**

| Stratum | Depth to top (m bgl) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | TP1 | TP2 | TP3 | TP4 | TP5 | TP5A | TP6 | TP7 | TP8 |
| Topsoil | 0.40 | - | 0.35 | 0.30 | 0.40 | 0.40 | 0.40 | 0.43 | 0.40 |
| Made Ground | - | 0.40 | - | - | 1.60 | 0.75 | - | | - |
| Brown fibrous peat (Made ground?) | - | - | - | - | 1.90 | - | - | - | - |
| Firm brown gravelly clay | - | - | - | - | - | 1.90 | - | - | - |
| Soft organic clay | - | - | - | - | 2.00* | 2.00* | - | - | - |
| Stiff sandy gravelly clay | 1.70* | 2.00 | 2.40 | 1.40 | - | - | 2.20* | 1.60* | 3.00* |
| Very stiff slightly sandy gravelly clay | - | 3.00* | 3.20* | 3.00* | - | - | - | - | |
| Groundwater | Dry | Dry | Dry | Dry | 1.20 | Seep | Dry | Dry | Dry |

*base of hole

## 7.6 Halesowen Formation

The Glacial Till was underlain by the solid geology of the Halesowen Formation. This material was weathered to very stiff to hard clay near the surface, with mudstone being encountered at depths of 8.00m to 11.00m bgl.

## 7.7 Groundwater

Groundwater was typically not encountered during the intrusive works with the exception of in TP5 and TP5a were a localised perched groundwater was encountered within the Made Ground. Monitoring of groundwater levels within the standpipes installed was undertaken between October and November 2015. The results are presented in Table 4.

**Table 4 Groundwater Monitoring Results**

| Hole | | WS4 | WS6 | WS9 |
|---|---|---|---|---|
| Depth to Water | 16 Oct 2015 | Dry | Dry | Dry |
| | 10 Nov 2015 | 0.47 | 1.58 | 0.19 |
| | 17 Nov 2015 | 0.45 | 1.13 | 0.22 |

## 7.8 Field Observations of Contamination

No visual or olfactory evidence of contamination was encountered.

## 7.9 Shrinkable Soils

Cohesive soils (clay and silt) may undergo volume change when subject to changes in moisture content. This can cause ground movement of soils where seasonal changes or tree root action affect the moisture content. Where foundations are constructed in such soils these movements can lead to damage of the superstructure. These movements are greatest where trees are removed or tree root systems are severed as this allows the soils to regain their equilibrium moisture content resulting in expansion.

Shrinkable soils are generally considered as soils containing greater than 35% fine particles and having a modified plasticity index (I'p) of 10% or greater. The Modified Plasticity Index is defined as the Plasticity Index (Ip) of the soil multiplied by the percentage of particles less than 425µm.

The NHBC (National House Building Council) has derived minimum foundation depths and other precautions relating to ground movements in shrinkable soils. These

standards are set out in NHBC Chapter 4.2 “Building Near Trees” (2001) and are commonly adopted for both residential and non-residential structures.

The Modified Plasticity Index is related to volume change potential and NHBC recommended minimum foundation depths as indicated in Table 5.

**Table 5 Volume Change Potential**

| Modified Plasticity Index | Volume Change Potential | Minimum Foundation Depth |
|---|---|---|
| 40% or greater | High | 1.00m |
| 20% to 40% | Medium | 0.90m |
| 10% to 20% | Low | 0.75m |

The plasticity indices of fourteen soil samples of the natural clay strata ranged from 15% to 30%, with the percentage of the soil <425µm ranging from 89% to 97%. The calculated modified plasticity indices ranged from 13% to 29%.

On this basis of the modified plasticity index, the clay soils would therefore be considered to be of **low to medium volume change potential** with respect to NHBC Chapter 4.2 “Building Near Trees” (NHBC, 2011). Consequently a minimum foundation depth of 0.90m is recommended where foundations are outside the influence zone of trees.

## 7.10 Soil Strength

The results of the Standard Penetration Tests (SPTs) in the windowless sampler boreholes ranged from 8 to 72 with a general increase in depth (see Figure 3). The SPT hammer energy ratio for the drilling rig is 76%. The corrected N60 values ranged from 10 to 91. A copy of the SPT hammer energy ratio certificate is included with the logs in Appendix C. Based on a plasticity index of 20%, the correlation proposed by Stroud 1975 gives a factor f1 of 5 between the SPT N values and undrained shear strength. This equates to values of 51kPa to 455kPa. The results of hand shear vane tests ranged from 57kPa to 120kPa (the upper limit of measurement for the apparatus). The shear strength values are shown on Figure 4.

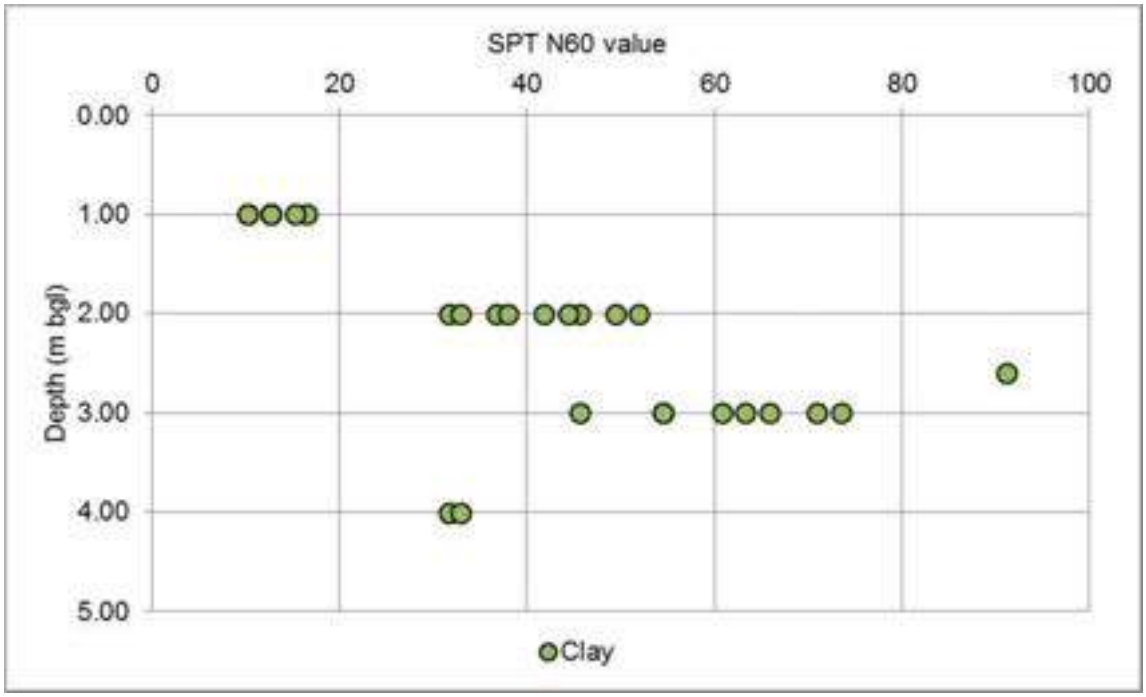



Figure 3 SPT N values

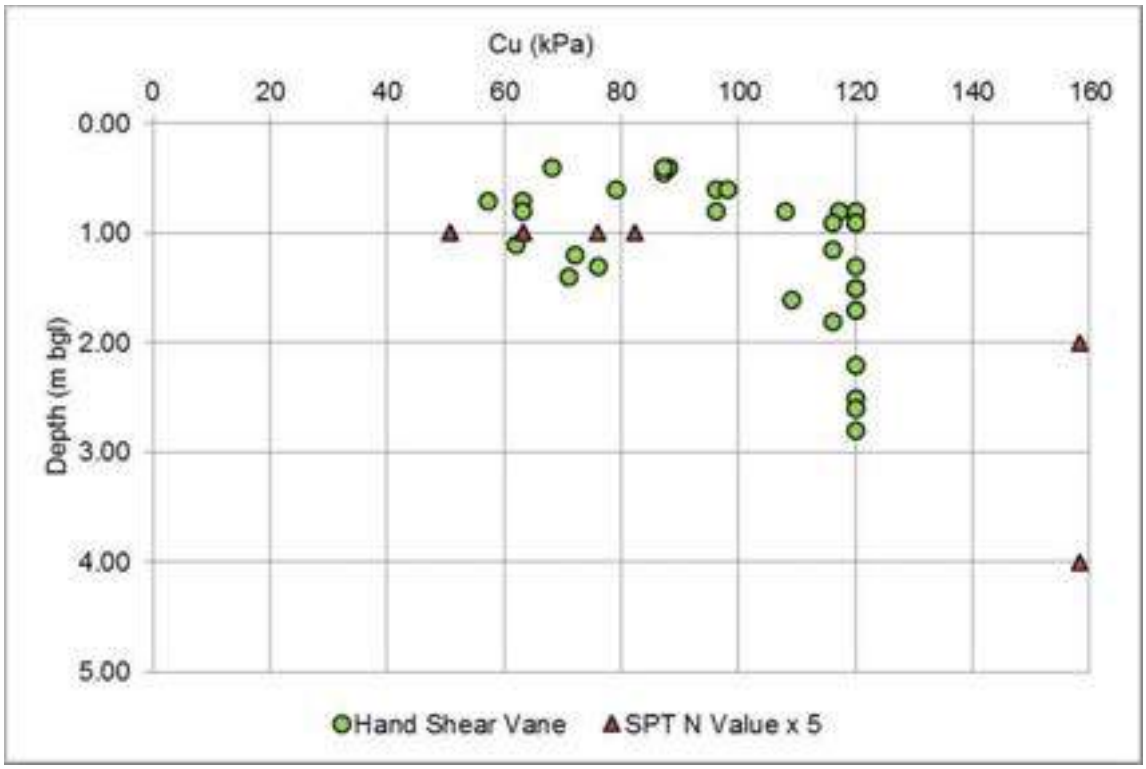



Figure 4 Shear strength

# 8 Geotechnical Assessment

## 8.1 Proposed Development

It is understood that the site is being considered for development of a new 7500m$^2$ secondary school together with access roads, infrastructure and playing field. A proposed development layout plan was provided by Manchester City Council. A copy of this plan is included in Appendix A. The development will include up to 4 storey high buildings and a single storey gymnasium.

## 8.2 Summary of Ground Conditions

The investigation identified between 0.25m and 0.40m of topsoil over firm to stiff glacial clays to between 1.80 and 2.40m bgl over very stiff to hard clays of the weathered mudstone. The bedrock itself was encountered at depths ranging from 8.00m to 11.00m bgl.

Localised Made Ground was also encountered. In WS1, WS2 and TP2 located within the former tennis courts. Made Ground comprising hardstanding was present to between 0.40 and 0.50m bgl. In TP5 Made Ground was encountered to a depth of 1.90m bgl.

No significant groundwater strikes /inflows were recorded during the investigation. During subsequent monitoring of the standpipes, groundwater was recorded at depths of approximately 0.19m to 1.58m bgl. The monitoring was undertaken during a period of wet weather, as result near surface soils had become saturated, waters within the well may therefore by the result of ingress of surface waters.

## 8.3 Foundation Design Principles

The two primary factors controlling the performance of foundations are bearing capacity and settlement. Usually the settlement tolerances of the structure are considerably less than the settlement that would be expected as the ultimate bearing capacity of the soils is approached. Therefore it is usually tolerable settlement that dictates the bearing pressure for foundation design. In general, the ultimate bearing capacity is usually divided by a safety factor of 3 for an allowable bearing capacity in order to maintain total settlement within tolerable limits for most structures, which is generally accepted to be 25mm. However, it should be noted that total settlements are

usually less than this value as the average actual imposed load will be less than the design load.

## 8.4 Foundation Design

Based on the ground conditions encountered, conventional spread foundations should be taken down through any Topsoil, Made Ground or soft deposits and constructed within the stiff clays at a minimum depth of 0.90m bgl.

Assessment of the hand shear vane measurements (Figure 4) indicates a conservative undrained shear strength of 65kPa in the Glacial Till. This value would provide a bearing capacity of 130kPa for strip foundations or 150kPa for square pads, in order to limit settlements to no more than 25mm. At a depth of 2.00m bgl the safe bearing capacity increases to 200kPa.

The clay soils are shrinkable (medium volume change potential) and therefore foundations will need to be deepened and have precautions adopted within the influence zone of existing, proposed or felled trees, in accordance with NHBC Chapter 4.2.

Total settlements for foundations designed to the above pressure are likely to be in the order of 15 to 25mm. There would be a reduction in settlements with foundation depth, as the soil strength increases. Imposing a lower bearing pressure would also reduce settlement.

Care must be taken where changes in strata are encountered at shallow depth and foundations that span from clay strata to granular soils or bedrock would need some reinforcement to resist differential settlements.

All foundations should be inspected by a suitably qualified and competent person to ensure that foundations are placed in competent material capable of supporting the intended loads and below any desiccated clay soils.

### 8.4.1 Piled Foundations

Where the proposed loads are too high for practical or economical construction of shallow foundations, piled foundations can offer a suitable alternative solution.

Based on the ground conditions and the nature of the development it is considered that bored or driven piles could be adopted. Pile depths will be subject to the final design loadings, method of installation and pile diameter.

It should be noted that bored piles will generate arising's that may require off site disposal.

The advice of a specialist piling contractor should be sought on the suitability and load carrying capacity of their proprietary techniques for use at this site.

Where foundations are within the influence of trees, a suitable compressible material or void former may be required for ring beams and sufficient longitudinal reinforcement incorporated into piles to resist tensile forces resulting from heave. The soils are of medium volume change potential.

In order to ensure the safe operation of tracked plant (e.g. piling rigs, cranes etc.), it will be necessary to design a suitable working platform. This can only be done in the context of the precise rig to be used and the route it will take to gain access. The data will require specific study for this design case.

## 8.5 Floor Slabs

The underlying soils near surface soils were shrinkable (medium volume change potential), therefore a suspended floor slab should is recommended with an appropriate underfloor void. Where a ground bearing floor slab is desired then care must be taken to avoid construction when there is a risk of desiccation of the formation, i.e. during dry and warm seasons or within the influence of vegetation or trees. Ground bearing floor slabs should also be avoided where the depth of Made Ground beneath the formation is greater than 600mm. The formation should be proof rolled and any soft spots replaced with well compacted granular fill. For preliminary design a CBR value of 3% should be assumed.

The ground gas monitoring is still on going and at this stage no details of any ground gas protection measures that may be required can be provided, although the initial three results indicate that no special precautions would be required.

## 8.6 Buried Structures

Notwithstanding the ground conditions revealed by the intrusive investigations, it is important to note that both foundation and ground floor slab construction could be

significantly influenced by pre-existing subsurface construction, associated with the historical development of the site. This could include, for example, foundations and underground services, which will need to be fully grubbed out beneath areas of new construction, in addition to other possible buried structures, infilled pits and channels. This is only anticipated in the location of the former pavilion.

## 8.7 Concrete Protection

Buried concrete classification is based on guidelines provided in BRE Special Digest 1 (BRE, 2005).

Chemical Analysis was undertaken on two soil samples for pH and a total potential sulphate suite (water soluble sulphate, total sulphate and total sulphur).

An assessment for total potential sulphate indicates that the soils are not considered to be pyritic and the design class should be based on soluble sulphates.

The pH values were 5.8 to 7.4 with water soluble sulphate concentrations of 15mg/l to 60mg/l. Therefore it is recommended that a Design Class of DS1 and AC1 should be assumed for buried concrete in accordance with BRE Special Digest 1 assuming natural ground and mobile groundwater conditions.

## 8.8 Pavement Design

The conditions prevailing at the time of construction will affect the CBR of the sub-grade soil and its strength. Research has shown the importance of the equilibrium moisture content of the sub-grade. The relationship between soil suction and the moisture content shows that a soil that becomes wet during construction will retain water and will therefore be weaker under the pavement in the equilibrium condition than a foundation that has remained dry, particularly for soils of low to medium plasticity.

Equilibrium CBR values for various materials for poor and good construction conditions are given in Interim Advice Note 73/06 "Design Guidance for Road Pavement Foundations (Draft HD25)" produced by the Highways Agency and these are summarised in Table 6 assuming a high water table and thin pavement construction.

**Table 6 Typical CBR Values**

| Soil Type | PI (%) | Equilibrium CBR (%) |
|---|---|---|
| Heavy clay | 50-70 | 2 |
| Silty clay | 30 | 3 |
| Sandy clay | 10-20 | 3-4 |
| Silt | - | 1 |
| sands and gravels | | > 5% |

The near surface soils are predominantly clays. Based on Table 6 it is recommended that a design CBR of 3% is adopted for these soils.

All Made Ground should be removed and the formation level should be proof rolled to identify any loose or soft spots, which should be removed and replaced with compacted granular fill. The formation level will also need to be protected during inclement weather from deterioration; all slopes should be trimmed to falls to shed rain water and the surface sealed to limit infiltration.

## 8.9 Excavations

Conventional mechanical backhoe excavators should prove suitable for excavation within the Glacial Till. The foundations to the former clubhouse on the site may require heavier plant to remove where they interfere with the proposed foundations.

Entry into shallow excavations by personnel should be minimised, and excavation stability should be assessed by suitably qualified and experienced staff and shoring used when required. Entry into deeper excavations should not be permitted unless full support is provided.

During subsequent monitoring of the standpipes, groundwater was recorded at depths of approximately 0.19m to 1.58m bgl. The monitoring was undertaken during a period of wet weather, as result near surface soils had become saturated, waters within the well may therefore by the result of ingress of surface waters.

The low permeability of the natural clay strata is likely to result in very low inflow rates and it is considered that groundwater control can be achieved by pumping.

## 8.10 Soakaway Drainage

Soakaway testing was undertaken in accordance with BRE 365 (2003) in two locations (TP1 and TP7).

Neither pit drained sufficiently to allow the calculation of an infiltration rate. However, the very low dissipation of water would suggest infiltrations rates are likely to be less than $1x10^{-6}$m/s.

The results of the soakaway testing are presented in Appendix D.

# 9 Contamination Risk Assessment

The primary legislative mechanism for contaminated land management in the UK is Part 2A of the Environmental Protection Act, 1990 (EPA). Part 2A was introduced into the EPA under Section 57 of the Environment Act 1995 to help deal with the substantial legacy of land contamination. It focuses on the identification and remediation of land which is in such a condition by reason of contamination that it gives rise to significant harm or the significant possibility of significant harm to certain named receptors, or gives rise to pollution of controlled waters or the likelihood of such pollution.

Local authorities are the principal regulator for inspection of land under Part 2A. In England, Part 2A is described fully in DEFRA Circular 01/2006, which also contains the statutory guidance (DEFRA, 2006). Part 2A defines contaminated land as:

*'…any land which appears to the Local Authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that*

a. *Significant harm is being caused or there is a significant possibility of such harm being caused; or*

b. *Pollution of controlled waters is being, or is likely to be, caused.'*

In applying the definition of Contaminated Land, Part 2A states that 'the Local Authority must:

- Identify a 'Pollution Linkage'. That is, a linkage between a contaminant and a receptor, by means of a pathway(s).
- Determine if the contaminant is causing significant harm to that receptor, or there is a significant possibility of such harm being caused by that contaminant to that receptor.

If any one element of the pollutant linkage is not present then the land should not be identified as 'contaminated land'.

Part 2A is designed to 'enable the identification and remediation of land on which contamination is causing unacceptable risks to human health or the wider environment. It does not necessarily include all land where contamination is present, even though such contamination may be relevant in the context of other regimes'. It is not directed

to assessing risks in relation to a future use of the land that would require a specific grant of planning permission.

The control of development and land use in the future is the responsibility of the planning system. A fundamental principle of sustainable development is that the condition of land, its use and its development should be protected from potential hazards. The National Planning Policy Framework (NPPF) requires the developer to obtain adequate site information to confirm that the site is suitable for its proposed use.

NPPF States that '*to prevent unacceptable risks from pollution and land instability, planning policies and decisions should ensure that new development is appropriate for its location*.'

Planning policies and decisions should also ensure that the site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation.

NPPF also states that after any required remediation, the land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990.

## 9.1 Introduction to Human Health Risk Assessment

A generic quantitative risk assessment (GQRA) has been undertaken using the geochemical results for the soil samples retained from the site. The approach to human health risk assessment adopted in this report is consistent with the Environment Agency's Model Procedures (CLR11) and other relevant guidance (including SR3, BS10175:2001 and NPPF).

The laboratory soil data has been compared to relevant and applicable critical concentrations as outlined in the guidance. These criteria can be either Generic Assessment Criteria (GAC) or Site Specific Assessment Criteria (SSAC). For the purpose of this generic quantitative risk assessment, GAC will be used. The GACs been derived from

- LQM/CIEH 'Suitable 4 Use Levels' (S4ULs) where available, or
- DEFRA C4SL Health Criteria Values (March 2014),

The proposed development is a school extension therefore a conservative end use of ***'residential public open space'*** has been assumed for the assessment.

The % total organic carbon (TOC) for the soils samples ranges from 0.40% to 3.00%, average 1.82 %. From this the Soil Organic Matter (SOM) can be calculated. The Environment Agency Briefing Note 7 (EA, 2005) states that %SOM = %TOC/0.58. Therefore for the site the SOM ranges from 0.69% to 5.17%, average 3.13%. Where the assessment criteria are reliant on Soil Organic Matter (SOM); assessment criteria derived for 2.5% SOM have been used.

The results of the laboratory geochemical soil analysis have been statistically analysed to ensure a true representative assessment of the site is made and allow a comparison with the appropriate GAC. Statistical analysis has been undertaken in accordance with the report: "Guidance on Comparing Soil Contamination Data with a Critical Concentration", published by the Chartered Institute of Environmental Health through CL:AIRE (Contaminated Land: Applications In Real Environments) in May 2008.

In order to undertake the statistical assessments, the ESI Contaminated Land Statistics Calculator software has been utilised. This software has been developed in accordance with the CL:AIRE guidance. The statistical tests are structured according to the reason for the assessment (i.e., whether the assessment is addressing concerns relating to either the planning or Part IIA regimes).

The statistical tests are presented in terms of a Null and an Alternative Hypothesis. The tests are structured to show, at the defined level of confidence, which of the two hypotheses is most likely to be true. By convention, the Null Hypothesis is the starting proposition against which the key question (i.e. can we confidently say that the level of contamination at the site is high relative to an appropriate measure of risk?) can be tested. Hence, for the planning assessment:

- The Null Hypothesis ($H_0$) is that the level of contamination in the study area is same as or greater than the critical concentration; and
- The Alternative Hypothesis is that the level of contamination is lower than the critical concentration.

If the Null Hypothesis cannot confidently be rejected, then further assessment or remediation may be required. However, if the Null Hypothesis can confidently be

rejected in favour of the Alternative Hypothesis, it can be concluded that there is good evidence that no further action is required.

## 9.2 Soil Assessment

To ascertain a preliminary assessment of the contaminative nature of the near surface materials across the site, twenty soil samples (10no topsoil, 4no made ground and 6no natural clay) were retained during the site investigation works and submitted for laboratory analysis.

The chemical analysis was undertaken at i2 Analytical laboratories. The results are included in Appendix F.

### 9.2.1 Heavy Metals

The results of the chemical analysis for heavy metal concentrations within the soil samples are summarised in Table 7.

**Table 7 Summary of Heavy Metals**

| Determinant | GAC | Concentration Range | | $H_0$ Rejected? | Evidence Level |
|---|---|---|---|---|---|
| | | Min | Max | | |
| Arsenic | 79 | 2.2 | 120 | Yes | 99% |
| Boron (w/s) | 21,000 | <0.2 | 1.4 | Yes | 100% |
| Cadmium | 120 | <0.2 | <0.2 | Yes | 100% |
| Chromium (total) | 1,500 | 17 | 30 | Yes | 100% |
| Chromium (VI) | 7.7 | <4.0 | <4.0 | Yes | 100% |
| Copper | 12,000 | 12 | 360 | Yes | 100% |
| Lead | 630* | 11 | 740 | Yes | 99% |
| Mercury | 16 | <0.3 | 1.5 | Yes | 100% |
| Nickel | 230 | 14 | 92 | Yes | 100% |
| Selenium | 1100 | <1.0 | <1.0 | Yes | 100% |
| Zinc | 81000 | 28 | 370 | Yes | 100% |

Results in mg/kg unless stated otherwise
GACs are LQM GAC unless stated otherwise
*DEFRA C4SL

All available metals soil data have been incorporated within the Statistical Calculator. The key inputs to and outputs from the Calculator tool are included in Appendix G.

Based on the full metals datasets for the near surface soils the Statistical Calculator indicates that we can be 100% confident in rejecting the Null Hypothesis for the planning scenario. This result indicates that the observed metals concentrations within the near surface soils are unlikely to pose any significant risks to human health in a Planning context.

### 9.2.2 Polyaromatic Hydrocarbons

The results of the chemical analysis for Polyaromatic Hydrocarbons (PAH US-EPA16) are summarised in Table 8.

**Table 8 Summary of Polyaromatic Hydrocarbons**

| Determinant | GAC | Concentration Range | | Topsoil | | Made Ground | | Glacial Till | |
|---|---|---|---|---|---|---|---|---|---|
| | | Min | Max | $H_0$ Rejected ? | Evidence Level | $H_0$ Rejected ? | Evidence Level | $H_0$ Rejected ? | Evidence Level |
| Acenaphthene | 15000 | < 0.10 | 7.9 | Yes | 100% | Yes | 100% | Yes | 100% |
| Acenaphthylene | 15000 | < 0.10 | 2.3 | Yes | 100% | Yes | 100% | Yes | 100% |
| Anthracene | 74000 | < 0.10 | 11 | Yes | 100% | Yes | 100% | Yes | 100% |
| Benz(a)anthracene | 29 | < 0.10 | 43 | Yes | 97% | Yes | 100% | Yes | 100% |
| Benzo(a)pyrene | 5.7 | < 0.10 | 36 | No | 0% | No | 70% | Yes | 100% |
| Benzo(b)fluoranthene | 7.2 | < 0.10 | 38 | No | 0% | No | 58% | Yes | 100% |
| Benzo(ghi)perylene | 640 | < 0.05 | 15 | Yes | 100% | Yes | 100% | Yes | 100% |
| Benzo(k)fluoranthene | 190 | < 0.10 | 29 | Yes | 100% | Yes | 100% | Yes | 100% |
| Chrysene | 57 | < 0.05 | 33 | Yes | 100% | Yes | 100% | Yes | 100% |
| Dibenz(a,h)anthracene | 0.57 | < 0.10 | 3.9 | No | 0% | No | 58% | Yes | 100% |
| Fluoranthene | 3100 | < 0.10 | 72 | Yes | 100% | Yes | 100% | Yes | 100% |
| Fluorene | 9900 | < 0.10 | 5.6 | Yes | 100% | Yes | 100% | Yes | 100% |
| Indeno(1,2,3-cd)pyrene | 82 | < 0.10 | 15 | Yes | 100% | Yes | 100% | Yes | 100% |
| Naphthalene | 4900 | < 0.05 | 3.3 | Yes | 100% | Yes | 100% | Yes | 100% |
| Phenanthrene | 3100 | < 0.10 | 55 | Yes | 100% | Yes | 100% | Yes | 100% |
| Pyrene | 7400 | < 0.10 | 68 | Yes | 100% | Yes | 100% | Yes | 100% |

Results in mg/kg unless stated otherwise
GACs are LQM S4UL for SOM of 2.5% unless stated otherwise
*DEFRA C4SL

All available PAH soil data has been incorporated within the Statistical Calculator. The key inputs to and outputs from the Calculator tool are included in Appendix G.

Benzo(a)pyrene, Benzo(b)fluoranthene and Dibenz(a,h)anthracene exceeding the S4UL soil guideline values have been recorded. No other PAH compounds were recorded concentrations exceeding the S4UL. The exceedances were recorded in one sample of the Made Ground (WS9 at 0.9m bgl) and in all of the topsoil samples. No exceedance of the S4UL were recorded within the Made Ground materials present beneath the former tennis courts.

### 9.2.3 Petroleum Hydrocarbons and BTEX

All soil samples were analysed for total petroleum hydrocarbons (TPH CGW) in an aromatic/aliphatic split and BTEX (benzene, toluene, ethylbenze and xylene), the results of which are summarised in Table 9.

**Table 9 Summary of Petroleum Hydrocarbons**

| Determinant | GAC | Concentration Range | | $H_0$ Rejected? | Evidence Level |
|---|---|---|---|---|---|
| | | Min | Max | | |
| EC>5-6 Aliphatic | 590,000 | <0.1 | <0.1 | Yes | 100% |
| EC>6-8 Aliphatic | 610,000 | <0.1 | <0.1 | Yes | 100% |
| EC>8-10 Aliphatic | 13,000 | <0.1 | <0.1 | Yes | 100% |
| EC>10-12 Aliphatic | 13,000 | <1.0 | <1.0 | Yes | 100% |
| EC>12-16 Aliphatic | 13,000 | <2.0 | 4.80 | Yes | 100% |
| EC>16-35 Aliphatic | 250,000 | <8.0 | 27.90 | Yes | 100% |
| EC>35-44 Aliphatic | 250,000 | <8.4 | <8.4 | Yes | 100% |
| EC>5-7 Aromatic | 56,000 | <0.1 | <0.1 | Yes | 100% |
| EC>7-8 Aromatic | 56,000 | <0.1 | <0.1 | Yes | 100% |
| EC>8-10 Aromatic | 5,000 | <0.1 | <0.1 | Yes | 100% |
| EC>10-12 Aromatic | 5,000 | <1.0 | 5.20 | Yes | 100% |
| EC>12-16 Aromatic | 5,100 | <2.0 | 100.00 | Yes | 100% |
| EC>16-21 Aromatic | 3,800 | <10 | 400.00 | Yes | 100% |
| EC>21-35 Aromatic | 3,800 | <10 | 780.00 | Yes | 100% |
| EC>35-44 Aromatic | 3,800 | <8.4 | 28.00 | Yes | 100% |
| Benzene | 72 | <0.001 | <0.001 | Yes | 100% |
| Toluene | 56,000 | <0.001 | <0.001 | Yes | 100% |
| Ethylbenzene | 24,000 | <0.001 | <0.001 | Yes | 100% |
| m&p-Xylene | 42,000 | <0.001 | <0.001 | Yes | 100% |
| o-Xylene | 42,000 | <0.001 | <0.001 | Yes | 100% |

Results in mg/kg unless stated otherwise
GACs are LQM S4UL for SOM of 2.5% unless stated otherwise
*DEFRA C4SL

All available TPH and BTEX soil data have been incorporated within the Statistical Calculator. The key inputs to and outputs from the Calculator tool are included in Appendix G.

Based on the full TPH and BTEX datasets the Statistical Calculator indicates that we can be 100% confident in rejecting the Null Hypothesis for the planning scenario. This result indicates that the observed TPH concentrations are unlikely to pose any significant risks to human health in a Planning context.

### 9.2.4 Summary

The results of the GQRA indicate elevated concentrations of contaminants of Benzo(a)pyrene, Benzo(b)fluoranthene and Dibenz(a,h)anthracene were recorded in the topsoil at concentrations which are considered to present a risk to Human Health of future site users for the proposed end use.

The determinants were found to be elevated in the all of the topsoil samples analysed. More detailed review of the exceedances indicates that they occur throughout the profile of the topsoil.

There were no obvious visual indicators within the topsoil materials which could indicate a source of the elevated PAH determinants. However, anecdotal information (1934 mapping) indicates the site was utilised as an athletics ground. Historically cinder tracks were used for athletics fields. If cinder / ash has been worked into the topsoil this may represent the source of the PAHs detected. No visual evidence of ash / cinder was however noted within the soils, the source of the PAHs is therefore uncertain.

Benzo(a)pyrene, Benzo(b)fluoranthene and Dibenz(a,h)anthracene at concentrations which are considered to present a risk to Human Health of future site users for the proposed end use have also been recorded within the Made Ground in WS9 at to 0.5m bgl in the north east of the site. Made Ground with a similar make up was encountered in TP5. No exceedance of the S4ULs were recorded with this materials.

No exceedances of the S4ULs were recorded within the made Ground present beneath the former tennis courts.

## 9.3 Controlled Waters

A typical GQRA for controlled waters comprises:

- comparison of detected concentrations in soil leachate with GAC to assess the potential risk posed to the groundwater receptor. The GAC selected for groundwater are the UK Drinking Water Quality Standards (DWS); and
- comparison of detected concentrations in soil leachate with GAC to assess the potential risk posed to the surface water receptors. The GAC selected for surface water are the Environmental Quality Standards (EQS). Robson Liddle considers that one pathway to surface water receptors is migration within groundwater. Therefore, if the contaminant is below the GAC in groundwater, it is unlikely to be above the GAC at the surface water receptor into which the groundwater may discharge, unless other factors are operating.

For groundwater, if no DWS are available, then EQS have been used as GAC. For surface water, if no EQS are available, then DWS have been used as GAC. World

Health Organisation (WHO) guidelines have been used as GAC if neither DWS nor EQS are available.

#### 9.3.1.1 Leachate Analysis

As part of this investigation leachate testing of three soil samples was undertaken, concentrations of metals, speciated TPH and speciated PAH (USEPA16).

Comparison of the leachate chemical test data with the selected generic screening criteria was undertaken and exceedances are summarised in Table 10 below.

**Table 10 Summary of Compounds of Concern Exceeding GAC in Leachate**

| Determinant | GAC | Source | Concentrations Recorded | | |
|---|---|---|---|---|---|
| | | | TP3 @ 0.1m | TP3 @ 0.7m | TP5 @ 0.1m |
| Arsenic | 10 | AA-EQS | <1.1 | <1.1 | **15** |
| Benzo(a)pyrene | 0.01 | UK DWS | **0.78** | <0.01 | <0.01 |
| Benzo(b)fluoranthene | 0.03 | AA-EQS | **0.50** | <0.01 | <0.01 |
| Benzo(ghi)perylene | 0.002 | AA-EQS | **0.72** | <0.01 | <0.01 |
| PAH (Sum of 4)* | 0.1 | UK DWS | **1.22** | <0.01 | <0.01 |
| PAH Total | 0.2 | UK DWS | **9.4** | <0.2 | <0.2 |

Notes

Results in µg/l unless stated otherwise
Exceedance of GAC shown in **bold**
* Benzo(b)fluoranthene, Benzo(ghi)perylene, Benzo(k)flouranthene, Indeno(1,2,3-cd)pyrene

Arsenic was recorded in the eluate generated from the one of the three samples subjected to leachate testing, above the limit of detection of 10µg/l.

Benzo(a)pyrene, Benzo(b)fluoranthene and Benzo(ghi)perylene were recorded in the eluate generated from the one of the three soils samples subjected to leachate testing above the limit of detection of 0.01µg/l.

Given the findings of the GQRA, it would be standard practise to recommend a controlled waters DQRA to assess the potential risk posed to the groundwater. However, the exceedances are marginal and an order of magnitude or less above the GAC, furthermore the GAC which are based on UK DWS are considered conservative. Robson Liddle considers that if DQRA was undertaken, then aquifer dilution would be considered, together with attenuation processes along the aquifer pathway to the surface water receptor. Aquifer dilution alone would raise the GAC by an order of magnitude, without consideration of attenuation processes. Furthermore laboratory soil leachate tests are quite stringent and may not represent actual conditions.

Therefore, at this stage, Robson Liddle considers that there is minimal risk to the identified controlled waters receptor, i.e. Secondary A Aquifer, from the contaminants identified above the GAC at the site.

## 9.4 Water Pipelines

The current guidance on selection of materials for water supply pipes to be laid in contaminated land is contained in UKWIR Report 10/WM/03/02 (re-issued 2010) which sets out in Table 3.1 of that document threshold values for a selection of organic contaminants that may have a detrimental effect on pipes and fittings. However, the document is for guidance and is not mandatory and has not been adopted universally by all water suppliers.

In addition, various consultative technical bodies have expressed concern on the nature of the document and the methodologies proposed, which would result in significant cost and time implications for all site assessments.

The investigation and assessment has indicated localised elevated concentrations of PAH and TPH contaminants within the near surface soils which may have the potential to attack plastics and as such standard pipework may not be suitable for the site. The PAHs are in general restricted to the Topsoil which extends to a maximum of 0.45 m bgl and localised area of Made Ground in the north and east of the site (WS1 to 0.4m bgl, TP5 to 1.6m bgl and WS9 to 0.5m bgl). We would envisage that potable water pipes servicing the proposed development will be installed below the Topsoil and that services will therefore not be in contact with the materials and consequently no special measures are likely to be required. Elevated TPH and PAHs were also recorded within the Made Ground in WS1, TP5 and WS9. If potable water pipes for proposed for the development are to be constructed through the areas of affected Made Ground then measures to protect from chemical attack may be required, these could include use of barrier pipe, and or clean services corridors.

In order to determine if measures to mitigate potential risks are required we would recommend that once that confirmation corridors for the development have been determined that the water supply company should be consulted regards the findings of the investigation

## 9.5 Ground Gas Assessment

### 9.5.1 Radon

The Groundsure GeoInsight report states that the site is in an area where the estimated probability of homes being above the action level of 200Bqm$^{-3}$ is less than 1%. No radon protective measures are required in the construction of new buildings or extensions.

Reference to BRE 211 (2007) confirms that no radon protective measures are required.

Confirmation of any protection measures should be agreed with the local authority building control.

### 9.5.2 Landfill Gas

The risks associated with the ground gases methane ($CH_4$) and carbon dioxide ($CO_2$) are assessed using BS 8485:2007 (Code of practice for the characterisation and remediation from ground gas in affected developments) and guidelines from CIRIA 665 (Wilson et al 2007) and the NHBC (Boyle and Witherington 2007).

No current or historical landfills are known to exist within 250m of the site. Localised evidence of buried biodegradable materials or other potential sources of ground gas were identified only within TP5 on the site.

Consequently the risks to end users from explosive or asphyxiating gases is considered low.

It is judged from the available evidence that the gas generation potential at the site is low. However gas monitoring has been undertaken to confirm this.

Current UK best practice guidance suggests that the ground gas assessment and characterisation for a site is dealt with separately for different types of development. In the above guidance:

'Situation A' covers all forms of development (residential and industrial/commercial developments), other than low rise residential development; and

'Situation B' is defined as the specific development of low-rise (one to three storeys in height) housing with beam and block floors, vented sub-floor void and gardens.

Based on our understanding of the likely redevelopment of the site, Situation B would be appropriate.

One of the assumptions in using the above guidance is that the worst-case ground gas regime has been identified on the site, for either CH4 or CO2, at the worst-case temporal conditions that the site may be expected to encounter (such as immediately following rapid changes in atmospheric pressure or prolonged rainfall). The idealised frequency of monitoring is suggested in CIRIA 665 Tables 5.5a and 5.5b. These tables are adapted from Wilson and Haines (2005) Table 3 which gives examples of ground conditions with the various gas generation potentials, ranging from inert Made Ground (very low potential) to post 1960s domestic landfill (very high potential).

It is judged from the available evidence that the gas generation potential at the site is low (localised organic soils/infill material) and the sensitivity of the development is moderate (education facility). Consequently, an appropriate minimum monitoring regime is 6 readings over 3 months, provided other monitoring requirements are also met, such as prevailing atmospheric pressure conditions (for example, BS 8485:2007 suggests monitoring shall include a period of falling atmospheric pressure).

### 9.5.3 Results

Ground gas monitoring is ongoing. The results of the initial three rounds of gas monitoring are presented in Table 11 overleaf.

**Table 11 Gas Monitoring Results - Maximum recorded values**

| Visit No | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Pressure (mb) | 1022/1021 | 1010/1008 | 999/993 | - | - | - |

| Borehole Ref: | | WS4 | WS6 | WS9 |
|---|---|---|---|---|
| Flow | Litres/hr | 0.0 | 0.0 | 0.0 |
| LEL | % | 0.0 | 0.0 | 0.0 |
| Methane | % | 0.0 | 0.0 | 0.0 |
| Carbon Dioxide | % | 0.6 | 1.9 | 0.5 |
| Oxygen | % | 20.3 | 18.6 | 20.4 |

For both Situation B a risk based "Gas Screening Value" (GSV) is calculated using the maximum gas concentration (%) x worst case borehole flow rate (l/h). Where zero values are recorded a conservation "less than minimum" detection value is adopted. For borehole flow rate this is < 0.1l/hr and for gas detection <0.1%.

Situation B this gives 0.019 x <0.1 = <0.0019 l/hr, which is less than the 0.07 l/hr threshold for "CIRIA Characteristic Situation 1 - very low risk", which also requires typically methane <1% and/or carbon dioxide <5%. Therefore, it is considered that the very low risk classification is applicable and therefore no gas protection measures are considered necessary.

### 9.5.4 Recommendations

On the basis of the gas monitoring to date CIRIA 665 (2007) suggests that no gas protection measures are required. Gas monitoring is on-going with a further three gas monitoring visits scheduled to be undertaken. An addendum report will be produced once the monitoring is completed.

# 10 Site Conceptual Model

Following the generic quantitative risk assessment, a summary of the receptors, sources and potential pollutant linkages identified for the site is presented in the following sections. This Site Conceptual Model is summarised in Table 12.

## 10.1 Receptors

It is understood that the site will be redeveloped as a new secondary school. Staffs, pupils and visitors are assumed therefore to occupy the site part-time and may be expected to be exposed directly to soils within the site. Construction workers would be directly exposed to soils, however this would only be short term.

- Staff, Pupils and Visitors of the proposed development.
- Construction workers.
- Construction materials (including services).
- Groundwater – Secondary A classification – considered to be at low risk.
- Surface water – No Nearby watercourses.
- Flora and fauna.

## 10.2 Sources

### 10.2.1 Contaminants

Elevated concentrations of contaminants of Benzo(a)pyrene, Benzo(b)fluoranthene and Dibenz(a,h)anthracene were recorded at levels which are considered to present a risk to Human Health of future site users for the proposed end use. The determinants were found to be elevated in the topsoil over the whole of the site. The exceedances were also recorded in one sample of the Made Ground (WS9 at 0.9m bgl).

### 10.2.2 Landfill gas

Monitoring is ongoing, however to date no risks from ground gas have been identified.

### 10.2.3 Radon

No radon protective measures are necessary in the construction of new developments or extensions.

## 10.3 Pathways

Generic possible pathways between potential sources and receptors are discussed as follows:

### 10.3.1 Receptor – Pupils, Staff and Visitors

- Dermal contact with contaminated soil.
- Ingestion of contaminated soil.
- Indoor and outdoor inhalation of dust or vapours.
- Ingestion of produce or soil particles on produce grown on site.

### 10.3.2 Receptor – Construction Workers

- Dermal contact with contaminated soil or water.
- Ingestion of contaminated soil or water.
- Outdoor inhalation of dust or vapours.

### 10.3.3 Receptor – Buildings and services

- Sulphate attack on concretes.
- Hydrocarbon attack on plastics which can result in tainting of potable water carried in supply pipes.

### 10.3.4 Receptor – Groundwater

- Infiltration and leaching of contaminants in soil into groundwater.
- Migration of contaminated water via drainage system.
- Migration of polluted groundwater to drinking water abstraction.

### 10.3.5 Receptor – Surface Water

- Run off of contaminants into surface water.
- Migration of contaminated water via drainage system.

### 10.3.6 Receptor – Flora and Fauna

- Uptake via root system.
- Displacement of oxygen from root systems.
- Harm to ecosystems from contaminated surface water.

Following the generic quantitative risk assessment, a summary of the potential pollutant linkages identified for the site is presented in the Site Conceptual Model in Table 12.

**Table 12 Site Conceptual Model**

| Potential Source and Pollutant | Receptor | Pathway | Potential Pollutant Linkage? | Probability of exposure, consequence and magnitude of risk. |
|---|---|---|---|---|
| Geochemistry of underlying soils and made ground at the site.<br><br>Sources on site include<br>• polyaromantic hydrocarbons within the topsoil<br>• Localised PAHs within the Made Ground within WS9. | Human Health – future users of the site e.g. pupils, staff and visitors. | Direct contact - Dermal contact, soil ingestion and dust inhalation. | Likely – elevated PAH determinants identified within the topsoil. | Probability: Likely<br>Consequence: Medium<br>Magnitude: **High Risk** |
| | | Indirect Contact - Vapour inhalation. | Likely – increased risk of direct contact with soils during the construction period. | Probability: Likely<br>Consequence: Medium<br>Magnitude: **High Risk** |
| | | Hydrocarbon tainting of potable water supply pipes. | Possible – elevated PAH determinants identified within the topsoil. Envisaged that any services would be installed with soils below the topsoil and therefore that services would not be in contact with the topsoil. Localised elevated TPH within Made ground in WS1, TP5 and WS9. If potable water pipes for proposed for the development are to be constructed through the areas of affected Made Ground then measures to protect from chemical attack may be required | Probability: Possible<br>Consequence: Medium<br>Magnitude: **Low Risk** |
| | Human Health – Construction workers | Direct contact - Dermal contact, soil ingestion and dust inhalation. | Likely – elevated PAH determinants identified within the topsoil. | Probability: Likely<br>Consequence: Medium<br>Magnitude: **High Risk** |
| | | Indirect Contact - Vapour inhalation. | Unlikely – elevated PAH identified however no significant concentrations of volatile determinants identified. | Probability: Unlikely<br>Consequence: Medium<br>Magnitude: **Low Risk** |
| | Controlled Waters – groundwater (Secondary Aquifer) | Leaching and percolation. | Unlikely – no sources identified and low permeability of underlying clay strata. | Probability: Unlikely<br>Consequence: Low<br>Magnitude: **Low Risk** |

| Potential Source and Pollutant | Receptor | Pathway | Potential Pollutant Linkage? | Probability of exposure, consequence and magnitude of risk. |
|---|---|---|---|---|
| | Controlled Waters – No surface water lies within 250m of the site. | Groundwater migration & run-off to surface waters carrying entrained sediment or diffuse contamination | Unlikely – no sources identified and no surface water lies within 250m of the site. | Probability: Unlikely<br>Consequence: Low<br>Magnitude: **Low Risk** |
| | Buried structures – Aggressive ground conditions | Direct contact and/or leaching (sulphate, pH). | Unlikely – underlying geology not expected to be aggressive. | Probability: Unlikely<br>Consequence: Medium<br>Magnitude: **Low Risk** |
| | Ecology - existing trees and landscaping on site. | Plant uptake. | Possible – elevated PAH determinants identified within the topsoil and no protected ecosystems on or in the vicinity of the site. | Probability: Possible<br>Consequence: Low<br>Magnitude: **Low Risk** |
| Ground gases. | Human Health – future users of the site e.g. pupils, staff and visitors. | Permeation through ground and intrusion into buildings and structures. | Unlikely – No sources of landfill gas identified. Localised organic soil identified. Elevated PAH identified however no significant concentrations of volatile determinants identified. | Probability: Unlikely<br>Consequence: Low<br>Magnitude: **Low Risk** |
| | Flora | Displacement of oxygen from root systems | Unlikely – no sources identified. | Probability: Unlikely<br>Consequence: Low<br>Magnitude: **Low Risk** |
| Radon. | Human Health – future users of the site e.g. pupils, staff and visitors. | Permeation through ground floor. | Unlikely – no protection measures required. | Probability: Unlikely<br>Consequence: Medium<br>Magnitude: **Low Risk** |

# 11 Outline Remedial Strategy

Elevated concentrations of contaminants of Benzo(a)pyrene, Benzo(b)fluoranthene and Dibenz(a,h)anthracene were recorded at levels which are considered to present a risk to Human Health of future site users for the proposed end use. The determinants were found to be elevated in the topsoil over the whole of the site and localised within Made Ground in WS9 at 0.5m bgl.

There were no obvious visual indicators within the topsoil materials which could indicate a source of the elevated PAH determinants. However anecdotal information (1934 mapping) indicates the site was utilised as an athletics ground. Historically cinder tracks were used for athletics fields and the cinder / ash which has been worked into the topsoil may therefore be a potential source.

With the information available from the current investigation, the following approach is suggested.

- Undertaking of additional investigation and assessment to profile the contamination within topsoil in the areas where soft landscaping is proposed. These works to allow more detailed zoning of the site, this in conjunction with more detailed quantitative risk assessment (DQRA) may result in a reduced remedial requirement, however this cannot be confirmed at this stage. RLL have previously derived site specific assessment criteria for primary schools sites, based on these criteria developed we envisage that DQRA is unlikely to remove the requirement for remediation, it may however reduce the extent of remedial actions.
- Completion of a detailed remedial options appraisal (ROA)
- Development of a remedial strategy and specification.
- Monitoring and validation

The above works would be required to be agreed with the statutory regulators.

With regards remediation actions these will be required to be considered as part of the overall construction works required at the site, in particular any earthworks requirement. They may include:

- A combination of: screening / segregation of soils; soil treatment (e.g. bio-remediation/soil washing etc.),-use of capping or as a last resort off-site disposal.
- Measures to protect water supply pipes and other utilities for chemical attack by hydrocarbons such as barrier pipe and or clean services corridors.

In addition, a Materials Management Plan will be required to allow re-use of suitable material at the site (see Section 11.1).

## 11.1 Material Reuse

Based on the GQRA carried out the natural clay materials and the Made Ground beneath the tennis courts do not pose a potential risk to identified receptors are and are considered suitable for re-use from a chemistry perspective.

The topsoil and the Made Ground in WS9 contain concentrations of PAHs that exceed their respective S4ULs and are therefore considered unsuitable for reuse in areas where there is the potential for future users to come into contact with the materials without the further assessment and or remedial action.

The re-use of on-site soils may be undertaken either under the Environmental Permitting Regulations 2007 (EPR), in which case soils other than uncontaminated soils are classed as waste, or under the CL:AIRE Voluntary Code of Practice (CoP) which was published in September 2008 and is now widely accepted as an alternative regime to the EPR.

Under the EPR, material that is contaminated but otherwise suitable for re-use is also classified as waste and its re-use should be in accordance with the Environmental Permitting Regulations 2007 (EPR).

Under the CL:AIRE Voluntary Code of Practice (CoP) materials excavated on-site are not deemed contaminated if suitable for re-use at specified locations or generally within the site. Material that may have been classified as hazardous waste under the EPR may be re-used. The CoP regime requires that a 'Qualified Person' as defined under the CoP reviews the development of the Materials Management Plan, including review of Risk Assessments and Remediation Strategy/Design Statement together with documentation relating to Planning and Regulatory issues, and signs a Declaration

which is forwarded to the Environment Agency and which confirms compliance with the CoP.

Based upon the data obtained from the ground investigation there would not be a requirement to take material off-site as long as a suitable Materials Management Plan (MMP) was in place.

# 12 Limitations and Uncertainties

## 12.1 General

This report has been prepared by Robson Liddle with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the Client.

The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true representative data with respect to site conditions. The information reported herein is based on the interpretation of data collected during the site investigation, pertaining specifically to the soil samples retained from the identified locations. Should additional information become available that may influence the opinions expressed in this report, Robson Liddle reserves the right to review such information and, if warranted, to alter the opinions accordingly.

The evaluation and conclusions do not preclude the existence of other site conditions and contamination, which could not reasonably have been revealed by the site investigation works undertaken at the time of writing. This report should be used for information purposes only and should not be construed as a comprehensive characterisation of all site conditions or potential contaminants.

It must be noted that the locations of the exploratory holes are, by requirement, usually free from buried services and structures, and therefore are more likely to encounter natural strata at a shallower depth than areas underlain by services and structures.

This report has been prepared solely for the use of the client, and may not be relied upon by other parties without written consent from Robson Liddle.

Robson Liddle disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of the work.

## 12.2 Site Specific

Only three of six scheduled gas monitoring visits have been undertaken to date. The risks from gas cannot therefore be fully assessed at this stage. The gas monitoring is being undertaken at fortnightly intervals

# 13 General Notes

This report will be prepared for the exclusive use of the client named in the document and copyright will subsist with Robson Liddle Limited. Prior written permission must be obtained to reproduce all or part of the report. It will be prepared on the understanding that you will disclose its contents to parties directly involved in the current investigation, preparation and development of the site. Further copies may be obtained with the client's written permission from Robson Liddle Limited with whom a master copy of the document will be retained.

The report and /or opinion will be prepared for the specific purpose stated in the document and in relation to the nature and extent of proposals made available to us at the time of your enquiry. The recommendations should not be used for other schemes on or adjacent to the site without further reference to Robson Liddle Limited. The assessment of the factual data will be provided to assist the client and his Engineer and/or advisors in the preparation of their designs.

The report will be based on the ground conditions encountered in the exploratory holes together with the results of field and laboratory testing in the context of the proposed development. There may be special conditions, appertaining to the site, however, which may not be revealed by the investigation, and which may not be taken into account in the report.

Methods of construction and/or design other than those proposed by the designers or referred to in the report may require consideration during the evolution of the proposals and further assessment of the geotechnical data would be required to provide discussion and recommendation appropriate to these methods.

The accuracy of the results reported will depend upon the technique of measurement, investigation and test used and these values should not be regarded necessarily as characteristic of the strata as a whole. Where such measurements are critical, the technique of the investigation will need to be reviewed and supplementary investigation undertaken in accordance with the advice of the company where necessary.

Whilst the report may express an opinion on possible configurations of strata between or beyond exploratory holes, or on possible presence of a feature based on either

visual, verbal, written, cartographical, photographic or published evidence, this will be for guidance only and no liability can be accepted for its accuracy.

Ground conditions should be monitored during the construction of the works and the recommendations of the report re-evaluated in the light of these data by the supervising geotechnical engineers.

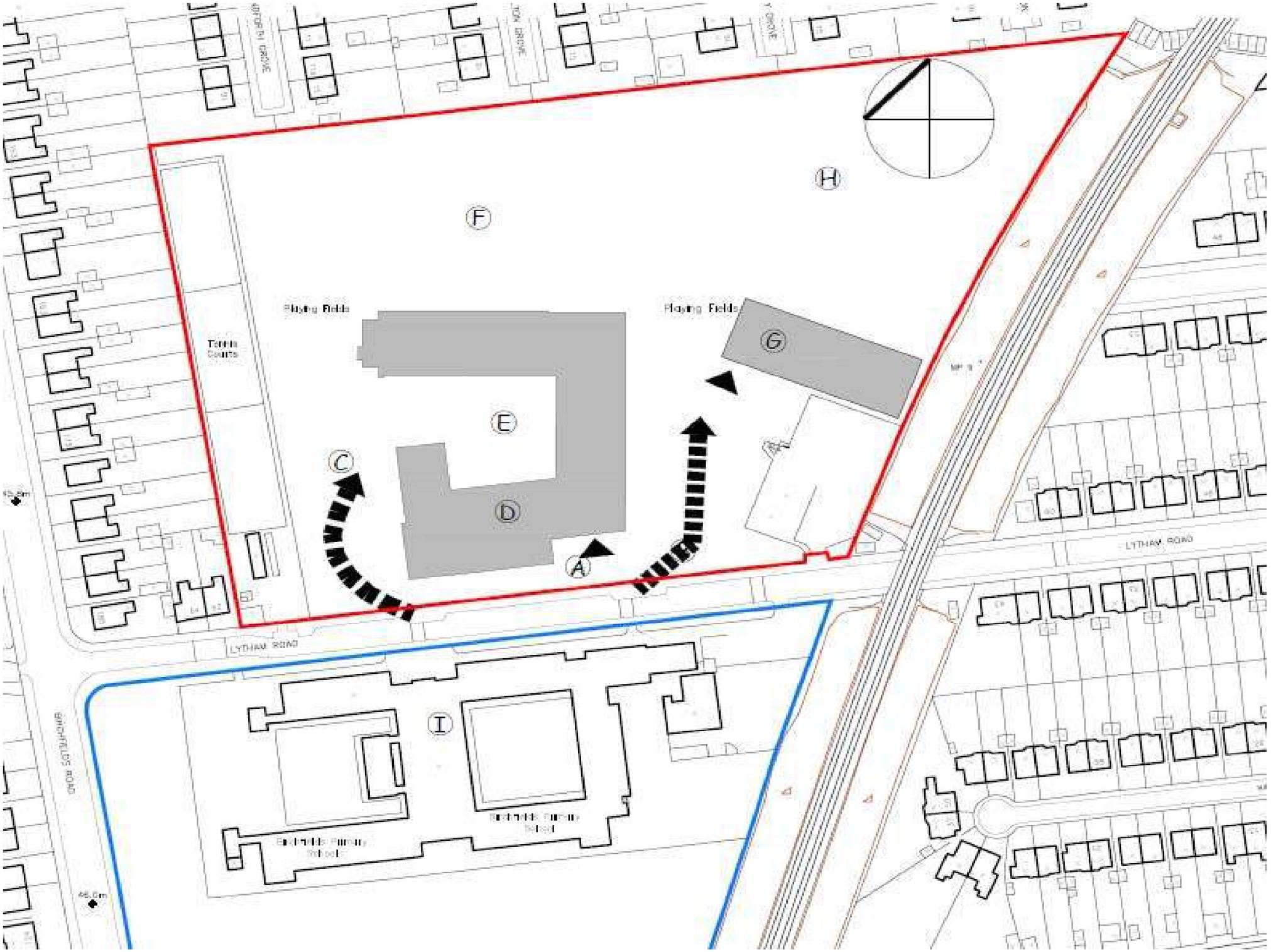
Any comments on groundwater conditions will be based on observations made at the time of the investigation, unless specifically stated otherwise. It should be noted, however, that the observations are subject to the method and speed of the boring, drilling or excavation and that groundwater levels will vary due to seasonal or other effects.

Unless specifically stated, the investigation will not take into account of possible effects of mineral extraction.

The economic viability of the proposals referred to in the report, or of the solutions put forward to any problems encountered, will depend on very many factors in addition to geotechnical considerations hence its evaluation will be outside the scope of the report.

# Appendix A

# Proposed Development Plan




| | |
|---|---|
| Project: | Lytham Road, Fallowfields, Manchester |
| Client: | Manchester City Council |
| Title: | Preliminary Site Layout |
| Drawing: | 12-12-16-1-1163/D01 |
| Date: | 18 Nov 2015 |

Notes:

Key

Proposed Building

Potential Access Routes

Robson Liddle
consulting engineers
part of the nps group

# Appendix B

# Exploratory Hole Plan

N

HANDFORTH GROVE

SKELTON GROVE

TARLEY GROVE

HARDON GROVE

TP8

TP4

WS10

TP3

WS2

WS3

TP5

TP7 (SA)

Playing Fields

Tennis Courts

TP2

WS4

CP2

WS9

CP3

area of proposed evelopment

TP6

WS1

WS6

WS8

WS5

CP1

WS7

TP1 (SA)

LYTHAM ROAD

BIRCHFIELDS ROAD

Birchfields Primary School

| | |
|---|---|
| Project: | Lytham Road, Fallowfields, Manchester |
| Client: | NPS Wigan |
| Title: | Exploratory Hole Location Plan |
| Drawing: | 12-12-16-1-1163/D02 |
| Date: | 12 Oct 2015 |

Notes:
Hole Locations

Key

- Windowless Sampler Borehole & Dynamic Probe
- Cable perssion borehole
- Machine Excavated Trial Pit
- SA — Soakaway Test
- Approx Footprint of Buildings

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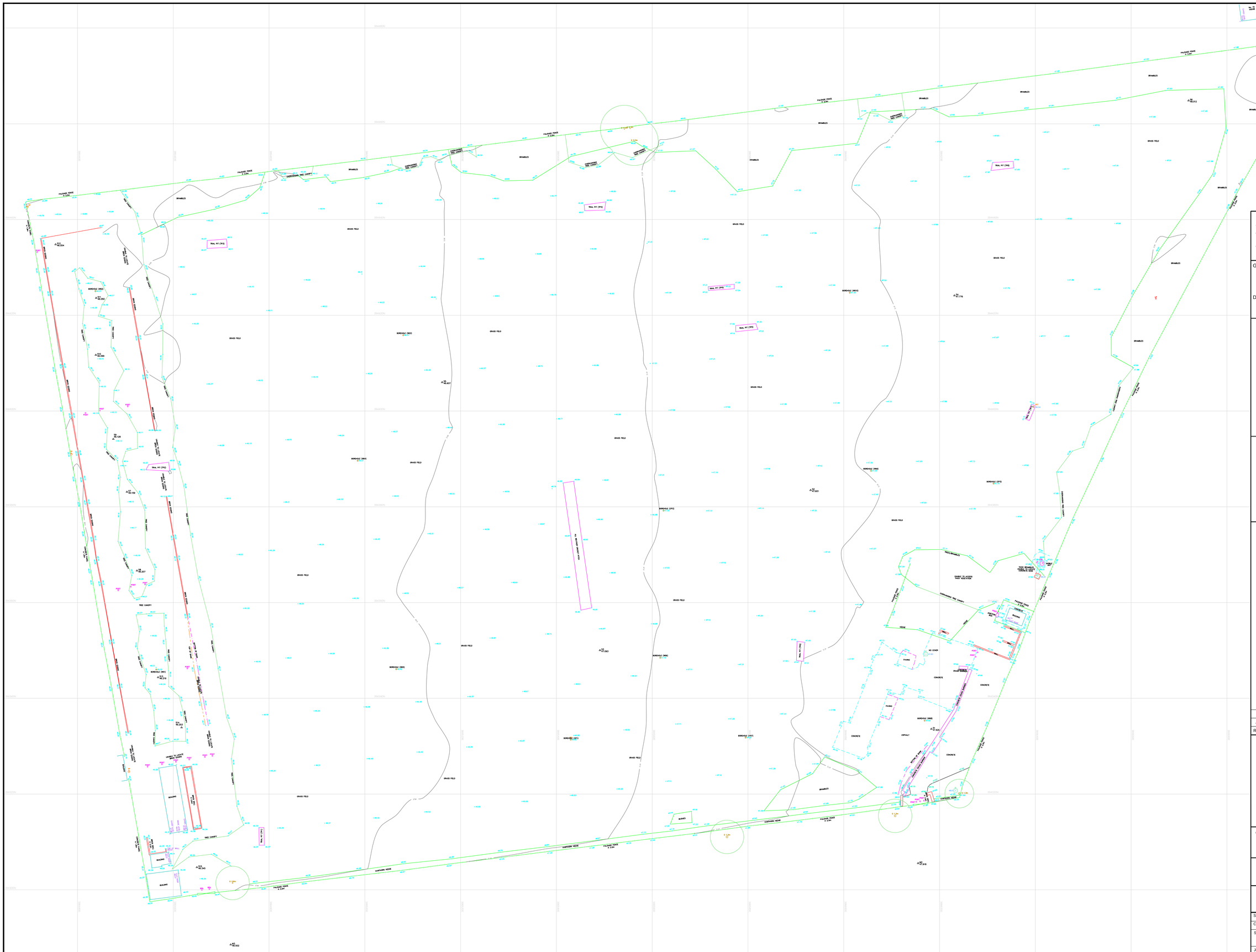
consulting engineers
part of the nps group


TRIAL PIT (TP1)
TRIAL PIT (TP2)
TRIAL PIT (TP3)
TRIAL PIT (TP4)
TRIAL PIT (TP5)
TRIAL PIT (TP6)
TRIAL PIT (TP7)
TRIAL PIT (TP8)
TRIAL PIT (TP9)
TRIAL PIT (TP10)
BOREHOLE (BH1)
BOREHOLE (BH2)
BOREHOLE (BH3)
BOREHOLE (BH4)
BOREHOLE (BH5)
BOREHOLE (BH6)
BOREHOLE (BH7)
BOREHOLE (BH8)
BOREHOLE (BH9)
BOREHOLE (BH10)
BOREHOLE (BH11)
BOREHOLE (BH12)
BOREHOLE (BH13)
BOREHOLE (BH14)
BOREHOLE (BH15)
BOREHOLE (BH16)
BOREHOLE (BH17)
BOREHOLE (BH18)
BOREHOLE (BH19)
BOREHOLE (BH20)
BOREHOLE

# Appendix C

# Exploratory Hole Logs

| | | | | | |
|---|---|---|---|---|---|
| CCG | Contract Name: Lytham Road, Manchester | | Client: Robson Liddle | | Borehole ID: **BH1** |
| | Contract Number: CCG-C-15-8540 | Date Started: 15/10/2015 | Logged By: DO | Checked By: | Status: DRAFT |
| Cable Percussion Borehole Log | Easting: | Northing: | Ground Level: 46.83 | Plant Used: Dando 150 S/A Rig | Print Date: 21/10/2015 |
| | | | | | Sheet 1 of 1 |
| | | | | | Scale: 1:50 |

Weather: | Termination: | SPT Hammer: CCG7 Energy Ratio: 72%

| Samples & In Situ Testing | | | Strata Details | | | | Groundwater | |
|---|---|---|---|---|---|---|---|---|
| Depth | Sample ID | Test Result | Level (mAOD) | Depth (m) (Thickness) | Legend | Strata Description | Water Strike | Backfill/ Installation |
| | | | | (0.30) 0.30 | | Grassed TOPSOIL | | |
| 0.50 | B | | | | | Firm becoming stiff brown slightly sandy slightly gravelly silty CLAY | | |
| 1.00 | B | | | | | | | |
| | | SPT(S) 1.20m, N=18 (1,3/4,4,5,5) | | | | | | |
| 1.50 | B | | | | | | | |
| 2.00 - 2.45 | U100 | | | | | | | |
| 2.50 | B | | | | | | | |
| | | SPT(S) 3.00m, N=27 (4,5/6,6,7,8) | | | | | | |
| 3.50 | B | | | | | | | |
| 4.00 - 4.45 | U100 | | | (7.70) | | | | |
| 4.50 | B | | | | | | | |
| | | SPT(S) 5.00m, N=28 (3,6/6,7,7,8) | | | | | | |
| 6.00 | B | | | | | | | |
| 6.50 | U100 | | | | | | | |
| 7.50 | B | | | | | | | |
| | | SPT(S) 8.00m, 50 (6,13/50 for 150mm) | | 8.00 | | Brown/grey MUDSTONE | | |
| | | | | (1.00) | | | | |
| 9.00 | B | SPT(S) 9.00m, 50 (25 for 60mm/50 for 40mm) | | 9.00 | | End of Borehole at 9.00m | | |

| Start & End of Shift Observations | | | | | Borehole Diameter | | Casing Diameter | |
|---|---|---|---|---|---|---|---|---|
| Date | Time | Depth (m) | Casing (m) | Water (m) | Depth (m) | Dia (mm) | Depth (m) | Dia (mm) |
| | | | | | | | | |

Remarks:
1 hour hand excavating 1.20mbgl service avoidance pit

| Chiselling | | | |
|---|---|---|---|
| From (m) | To (m) | Duration | Remarks |
| 8.30 | 9.00 | 00:30 | |

| Installation | | | |
|---|---|---|---|
| Top (m) | Base (m) | Type | Dia (mm) |
| | | | |

Water Strikes

| Strike (m) | Casing (m) | Sealed (m) | Time (mins) | Rose to (m) | Remarks |
|---|---|---|---|---|---|
| | | | 0 | | Borehole dry |

| | | | | | |
|---|---|---|---|---|---|
| Contract Name: Lytham Road, Manchester | | | Client: Robson Liddle | | Borehole ID: BH2 |
| Contract Number: CCG-C-15-8540 | Date Started: 19/10/2015 | Logged By: DO | Checked By: | Status: DRAFT | Sheet 1 of 2 |
| Cable Percussion Borehole Log | Easting: | Northing: | Ground Level: 47.00 | Plant Used: Dando 150 S/A Rig | Print Date: 21/10/2015 | Scale: 1:50 |
| Weather: | | Termination: | | SPT Hammer: CCG6 Energy Ratio: 65% | |

| Samples & In Situ Testing | | | Strata Details | | | | Groundwater | |
|---|---|---|---|---|---|---|---|---|
| Depth | Sample ID | Test Result | Level (mAOD) | Depth (m) (Thickness) | Legend | Strata Description | Water Strike | Backfill/ Installation |
| | | | | (0.40) | | Grassed TOPSOIL | | |
| | | | | 0.40 | | Firm becoming stiff brown slightly sandy slightly gravelly silty CLAY | | |
| 0.50 | B | | | | | | | |
| 1.00 | B | | | | | | | |
| | | SPT(S) 1.20m, N=15 (1,2/3,3,4,5) | | | | | | |
| 1.50 | B | | | | | | | |
| 2.00 - 2.45 | U100 | | | | | | | |
| 2.50 | B | | | | | | | |
| | | SPT(S) 3.00m, N=24 (3,5/5,6,6,7) | | | | | | |
| 3.50 | B | | | | | | | |
| 4.00 - 4.45 | U100 | | | | | | | |
| 4.50 | B | | | | | | | |
| | | SPT(S) 5.00m, N=21 (2,4/4,5,6,6) | | (9.60) | | | | |
| 6.00 | B | | | | | | | |
| 6.50 - 6.95 | U100 | | | | | | | |
| 7.50 | B | | | | | | | |
| | | SPT(S) 8.00m, N=30 (4,5/6,6,7,11) | | | | | | |
| 9.50 - 9.95 | U100 | | | | | | | |
| 9.50 | B | | | | | | | |
| | | | | | | Continued next sheet | | |

| Start & End of Shift Observations | | | | | Borehole Diameter | | Casing Diameter | |
|---|---|---|---|---|---|---|---|---|
| Date | Time | Depth (m) | Casing (m) | Water (m) | Depth (m) | Dia (mm) | Depth (m) | Dia (mm) |
| | | | | | | | | |

Remarks:
1 hour hand excavating 1.20mbgl service avoidance pit

| Chiselling | | | | Installation | | | |
|---|---|---|---|---|---|---|---|
| From (m) | To (m) | Duration | Remarks | Top (m) | Base (m) | Type | Dia (mm) |
| 10.20 | 11.00 | 00:30 | | | | | |

| Water Strikes | | | | | |
|---|---|---|---|---|---|
| Strike (m) | Casing (m) | Sealed (m) | Time (mins) | Rose to (m) | Remarks |
| | | | 0 | | Borehole dry |

| | | | | | |
|---|---|---|---|---|---|
| CCG | Contract Name: Lytham Road, Manchester | | Client: Robson Liddle | | Borehole ID: **BH2** |
| | Contract Number: CCG-C-15-8540 | Date Started: 19/10/2015 | Logged By: DO | Checked By: | Status: DRAFT — Sheet 2 of 2 |
| Cable Percussion Borehole Log | Easting: | Northing: | Ground Level: 47.00 | Plant Used: Dando 150 S/A Rig | Print Date: 21/10/2015 — Scale: 1:50 |
| Weather: | | Termination: | | SPT Hammer: CCG6 Energy Ratio: 65% | |

| Samples & In Situ Testing | | | Strata Details | | | | Groundwater | |
|---|---|---|---|---|---|---|---|---|
| Depth | Sample ID | Test Result | Level (mAOD) | Depth (m) (Thickness) | Legend | Strata Description | Water Strike | Standpipe Installation |
| 10.50 | B | | | 10.20 | | Red/grey MUDSTONE | | |
| | | | | (0.80) | | | | |
| | | SPT(S) 11.00m, 50 (25 for 40mm/50 for 30mm) | | 11.00 | | End of Borehole at 11.00m | | |

| Start & End of Shift Observations | | | | | Borehole Diameter | | Casing Diameter | |
|---|---|---|---|---|---|---|---|---|
| Date | Time | Depth (m) | Casing (m) | Water (m) | Depth (m) | Dia (mm) | Depth (m) | Dia (mm) |
| | | | | | | | | |

| Chiselling | | | |
|---|---|---|---|
| From (m) | To (m) | Duration | Remarks |
| | | | |

| Installation | | | |
|---|---|---|---|
| Top (m) | Base (m) | Type | Dia (mm) |
| | | | |

Remarks:
1 hour hand excavating 1.20mbgl service avoidance pit

| Water Strikes | | | | | |
|---|---|---|---|---|---|
| Strike (m) | Casing (m) | Sealed (m) | Time (mins) | Rose to (m) | Remarks |
| | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| CCG | Contract Name: Lytham Road, Manchester | | Client: Robson Liddle | | Borehole ID: BH3 |
| | Contract Number: CCG-C-15-8540 | Date Started: 16/10/2015 | Logged By: DO | Checked By: | Status: DRAFT |
| Cable Percussion Borehole Log | Easting: | Northing: | Ground Level: 47.75 | Plant Used: Dando 150 S/A Rig | Print Date: 21/10/2015 |
| | | | | | Sheet 1 of 2 |
| | | | | | Scale: 1:50 |
| Weather: | | Termination: | | SPT Hammer: CCG6 Energy Ratio: 65% | |

| Samples & In Situ Testing | | | Strata Details | | | | Groundwater | |
|---|---|---|---|---|---|---|---|---|
| Depth | Sample ID | Test Result | Level (mAOD) | Depth (m) (Thickness) | Legend | Strata Description | Water Strike | Backfill/ Installation |
| | | | | (0.40) | | Grassed TOPSOIL | | |
| 0.50 | B | | | 0.40 | | Firm becoming stiff brown slightly sandy slightly gravelly silty CLAY | | |
| 1.00 | B | SPT(S) 1.20m, N=13 (1,2/2,3,4,4) | | | | | | |
| 1.50 | B | | | | | | | |
| 2.00 - 2.45 | U100 | | | | | | | |
| 2.50 | B | | | | | | | |
| | | SPT(S) 3.00m, N=15 (1,2/3,3,4,5) | | | | | | |
| 3.50 | B | | | | | | | |
| 4.00 - 4.45 | U100 | | | | | | | |
| 4.50 | B | | | | | | | |
| | | SPT(S) 5.00m, N=21 (2,4/4,5,6,6) | | (10.60) | | | | |
| 6.00 | B | | | | | | | |
| 6.50 - 6.95 | U100 | | | | | | | |
| 7.50 | B | | | | | | | |
| | | SPT(S) 8.00m, N=22 (3,4/4,5,6,7) | | | | | | |
| 9.00 | B | | | | | | | |
| 9.50 - 9.95 | U100 (NR) | SPT(S) 9.50m, N=20 (2,4/4,4,6,6) | | | | | | |
| | | | | | | Continued next sheet | | |

| Start & End of Shift Observations | | | | | Borehole Diameter | | Casing Diameter | |
|---|---|---|---|---|---|---|---|---|
| Date | Time | Depth (m) | Casing (m) | Water (m) | Depth (m) | Dia (mm) | Depth (m) | Dia (mm) |
| | | | | | | | | |

Remarks:
1 hour hand excavating 1.20mbgl service avoidance pit

| Chiselling | | | |
|---|---|---|---|
| From (m) | To (m) | Duration | Remarks |
| 11.00 | 11.50 | 00:30 | |

| Installation | | | |
|---|---|---|---|
| Top (m) | Base (m) | Type | Dia (mm) |
| | | | |

Water Strikes

| Strike (m) | Casing (m) | Sealed (m) | Time (mins) | Rose to (m) | Remarks |
|---|---|---|---|---|---|
| | | | 0 | | Borehole dry |

| | | | | | |
|---|---|---|---|---|---|
| CCG | Contract Name: Lytham Road, Manchester | | Client: Robson Liddle | | Borehole ID: **BH3** |
| | Contract Number: CCG-C-15-8540 | Date Started: 16/10/2015 | Logged By: DO | Checked By: | Status: DRAFT |
| Cable Percussion Borehole Log | Easting: | Northing: | Ground Level: 47.75 | Plant Used: Dando 150 S/A Rig | Print Date: 21/10/2015 |
| | | | | | Sheet 2 of 2 |
| | | | | | Scale: 1:50 |

Weather: | Termination: | SPT Hammer: CCG6 Energy Ratio: 65%

| Samples & In Situ Testing | | | Strata Details | | | | Groundwater | |
|---|---|---|---|---|---|---|---|---|
| Depth | Sample ID | Test Result | Level (mAOD) | Depth (m) (Thickness) | Legend | Strata Description | Water Strike | Backfill / Installation |
| 10.50 | B | | | | | | | |
| | | SPT(S) 11.00m, 50 (5,12/50 for 40mm) | | 11.00 | | Red MUDSTONE | | |
| | | | | (0.50) | | | | |
| | | SPT(S) 11.50m, 50 (25 for 50mm/50 for 40mm) | | 11.50 | | End of Borehole at 11.50m | | |

| Start & End of Shift Observations | | | | |
|---|---|---|---|---|
| Date | Time | Depth (m) | Casing (m) | Water (m) |
| | | | | |

| Borehole Diameter | | Casing Diameter | |
|---|---|---|---|
| Depth (m) | Dia (mm) | Depth (m) | Dia (mm) |
| | | | |

Remarks:
1 hour hand excavating 1.20mbgl service avoidance pit

| Chiselling | | | |
|---|---|---|---|
| From (m) | To (m) | Duration | Remarks |
| | | | |

| Installation | | | |
|---|---|---|---|
| Top (m) | Base (m) | Type | Dia (mm) |
| | | | |

Water Strikes

| Strike (m) | Casing (m) | Sealed (m) | Time (mins) | Rose to (m) | Remarks |
|---|---|---|---|---|---|
| | | | | | |

# Robson Liddle Geotechnical

NPS Property Consultants

## TRIAL PIT LOG

| Project: | | | | TRIAL PIT No.: |
|---|---|---|---|---|
| Lytham Road | | | | **TP1** |
| Job No.: 12-12-16-1-1163 | Date Start 14-10-15 End 14-10-15 | Ground Level: (m) 46.37 | Co-Ordinates: () | |
| Client Manchester City Council | | | | Sheet: 1 of 1 |

| SAMPLES & TESTS | | | Water | STRATA | | | |
|---|---|---|---|---|---|---|---|
| Depth | Type | Test Result | | Ground Level | Legend | Depth (Thickness) | DESCRIPTION |
| 0.30 | ES | | | 45.97 | | (0.40) 0.40 | TOPSOIL: Dark brown clay. Many rootlets. |
| 1.10 | D | | | 44.67 | | (1.30) 1.70 | Firm to stiff grey mottled brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded sandstone and mudstone. |

### GENERAL REMARKS

Dry and stable on completion.
BRE Infiltration testing undertaken.
Backfilled with arisings.

| All dimensions in metres Scale 1:25 | Contractor: Spektral | Method/ Plant Used JCB 3CX | Logged By CRi |
|---|---|---|---|

ROBSON LIDDLE TP 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## TRIAL PIT LOG

| Project: Lytham Road | | | TRIAL PIT No.: TP2 |
|---|---|---|---|
| Job No.: 12-12-16-1-1163 | Date Start 14-10-15 End 14-10-15 | Ground Level: (m) 46.12 | Co-Ordinates: () |
| Client Manchester City Council | | | Sheet: 1 of 1 |

| SAMPLES & TESTS | | | Water | STRATA | | | |
|---|---|---|---|---|---|---|---|
| Depth | Type | Test Result | | Ground Level | Legend | Depth (Thickness) | DESCRIPTION |
| | | | | 46.06 | | 0.06 | MADE GROUND: Bitumen |
| 0.25 | ES | | | | | (0.34) | MADE GROUND: Dark brown fine to coarse gravel of clinker, coal, tarmac, red shale. |
| 0.30 | ES | | | 45.72 | | 0.40 | |
| | | | | | | | Firm to stiff grey mottled brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded sandstone and mudstone. |
| 1.20 | D | | | | | (1.60) | |
| | | | | 44.12 | | 2.00 | |
| 2.10 | D | | | | | (1.00) | Very stiff grey finely laminated CLAY. |
| | | | | 43.12 | | 3.00 | |

### GENERAL REMARKS

Dry and stable on completion.
Backfilled with arisings.

| All dimensions in metres Scale 1:25 | Contractor: Spektral | Method/ Plant Used JCB 3CX | Logged By CRi |
|---|---|---|---|

ROBSON LIDDLE TP 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## TRIAL PIT LOG

| Project: Lytham Road | | | TRIAL PIT No.: TP3 |
|---|---|---|---|
| Job No.: 12-12-16-1-1163 | Date Start 14-10-15 End 14-10-15 | Ground Level: (m) 46.07 | Co-Ordinates: () |
| Client Manchester City Council | | | Sheet: 1 of 1 |

| SAMPLES & TESTS | | | Water | STRATA | | | |
|---|---|---|---|---|---|---|---|
| Depth | Type | Test Result | | Ground Level | Legend | Depth (Thickness) | DESCRIPTION |
| 0.10 | ES | | | 45.72 | | (0.35) 0.35 | TOPSOIL: Dark brown clay. Many rootlets. |
| 0.70 | ES | | | | | (2.05) | Firm to stiff grey mottled brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded sandstone and mudstone. |
| 1.50 | D | | | | | | |
| 2.15 | D | | | 43.67 | | 2.40 | 2.10 - 2.35 ... clayey sand layer. |
| | | | | 42.87 | | (0.80) 3.20 | very stiff brown slightly gravelly CLAY. Gravel is fine to medium sandstone. Occassional cobble. |

### GENERAL REMARKS

Stable on completion. Slight seepage at 1.8m and 2.75m bgl.
Backfilled with arisings.

| All dimensions in metres Scale 1:25 | Contractor: Spektral | Method/ Plant Used JCB 3CX | Logged By CRi |
|---|---|---|---|

# Robson Liddle Geotechnical

NPS Property Consultants

## TRIAL PIT LOG

| Project: Lytham Road | | | TRIAL PIT No.: TP4 |
|---|---|---|---|
| Job No.: 12-12-16-1-1163 | Date Start 14-10-15 End 14-10-15 | Ground Level: (m) 46.89 | Co-Ordinates: () |
| Client Manchester City Council | | | Sheet: 1 of 1 |

| SAMPLES & TESTS | | | Water | STRATA | | | |
|---|---|---|---|---|---|---|---|
| Depth | Type | Test Result | | Ground Level | Legend | Depth (Thickness) | DESCRIPTION |
| 0.15 | ES | | | 46.59 | | (0.30) 0.30 | TOPSOIL: Dark brown clay. Many rootlets. |
| | | | | 45.49 | | (1.10) 1.40 | Firm to stiff grey mottled brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded sandstone and mudstone. Occasional mudstone cobble. Sandy Silt partings. |
| 1.50 | D | | | 43.89 | | (1.60) 3.00 | very stiff grey finely laminated gravelly CLAY. Gravel is fine to medium subrounded sandstone and subangular coal. |

### GENERAL REMARKS

Dry and stable on completion.
Backfilled with arisings.

| All dimensions in metres Scale 1:25 | Contractor: Spektral | Method/ Plant Used JCB 3CX | Logged By CRi |
|---|---|---|---|

ROBSON LIDDLE TP 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## TRIAL PIT LOG

| Project: Lytham Road | | | TRIAL PIT No.: TP5 |
|---|---|---|---|
| Job No.: 12-12-16-1-1163 | Date Start 14-10-15 End 14-10-15 | Ground Level: (m) 47.22 | Co-Ordinates: () |
| Client Manchester City Council | | | Sheet: 1 of 1 |

| SAMPLES & TESTS | | | Water | STRATA | | | |
|---|---|---|---|---|---|---|---|
| Depth | Type | Test Result | | Ground Level | Legend | Depth (Thickness) | DESCRIPTION |
| | | | | 46.82 | | (0.40) 0.40 | TOPSOIL: Dark brown clay. Many rootlets. |
| 1.10 | ES | | | 45.62 | | (1.20) 1.60 | MADE GROUND: Dark brown medium to coarse gravel of sandstone, ceramic, glass, brick and mixed lithologies. |
| | | | | 45.32 | | (0.30) 1.90 | MADE GROUND: Brown fibrous peat. |
| | | | | 45.22 | | 2.00 | Soft grey CLAY. |

### GENERAL REMARKS

Terminated at 2m.
Sides collapsing from 1.0m.
Water strong inflow from 1.2m.

| All dimensions in metres Scale 1:25 | Contractor: Spektral | Method/ Plant Used JCB 3CX | Logged By CRi |
|---|---|---|---|

ROBSON LIDDLE TP 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## TRIAL PIT LOG

| Project: | | | | TRIAL PIT No.: |
|---|---|---|---|---|
| Lytham Road | | | | **TP5a** |
| Job No.: 12-12-16-1-1163 | Date Start 14-10-15 End 14-10-15 | Ground Level: (m) 47.22 | Co-Ordinates: () | |
| Client Manchester City Council | | | | Sheet: 1 of 1 |

| SAMPLES & TESTS | | | Water | STRATA | | | |
|---|---|---|---|---|---|---|---|
| Depth | Type | Test Result | | Ground Level | Legend | Depth (Thickness) | DESCRIPTION |
| 0.20 | ES | | | 46.82 | | (0.40) 0.40 | TOPSOIL: Dark brown clay. Many rootlets. |
| | | | | 46.47 | | (0.35) 0.75 | MADE GROUND: Dark brown gravelly clay. Gravel is medium sandstone, ceramic, glass and brick. |
| 1.10 | ES | | | 45.32 | | (1.15) 1.90 | Brown mottled grey CLAY. |
| | | | | 45.22 | | 2.00 | Soft grey CLAY. |

### GENERAL REMARKS

Trial pit 5m long. Dry and stable to western end (3m).
At eastern end (2m) Made Ground as per TP5 was encountered from 1.0m to 1.7m with brown peaty material from 1.7 mto 1.8m and soft grey clay from 1.8m to 2.5m. The Made Ground from 1.0 was wet.

| All dimensions in metres Scale 1:25 | Contractor: Spektral | Method/ Plant Used JCB 3CX | Logged By CRi |
|---|---|---|---|

ROBSON LIDDLE TP 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## TRIAL PIT LOG

| Project: Lytham Road | | | TRIAL PIT No.: TP6 |
|---|---|---|---|
| Job No.: 12-12-16-1-1163 | Date Start 14-10-15 End 14-10-15 | Ground Level: (m) 47.45 | Co-Ordinates: () |
| Client Manchester City Council | | | Sheet: 1 of 1 |

| SAMPLES & TESTS | | | Water | STRATA | | | |
|---|---|---|---|---|---|---|---|
| Depth | Type | Test Result | | Ground Level | Legend | Depth (Thickness) | DESCRIPTION |
| 0.20 | ES | | | 47.05 | | (0.40) 0.40 | TOPSOIL: Dark brown clay. Many rootlets. |
| 0.70 | D | | | 46.05 | | (1.00) 1.40 | Firm to stiff grey mottled brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded sandstone and mudstone. Occasional mudstone cobble. Sandy Silt partings. |
| | | | | 45.25 | | (0.80) 2.20 | very stiff grey finely laminated gravelly CLAY. Gravel is fine to medium subrounded sandstone and subangular coal. |

### GENERAL REMARKS

Dry and stable on completion.
Backfilled with arisings.

| All dimensions in metres Scale 1:25 | Contractor: Spektral | Method/ Plant Used JCB 3CX | Logged By CRi |
|---|---|---|---|

ROBSON LIDDLE TP 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## TRIAL PIT LOG

| Project: | | | | TRIAL PIT No.: |
|---|---|---|---|---|
| Lytham Road | | | | **TP7** |
| Job No.: 12-12-16-1-1163 | Date Start 14-10-15 End 14-10-15 | Ground Level: (m) 47.71 | Co-Ordinates: () | |
| Client Manchester City Council | | | | Sheet: 1 of 1 |

| SAMPLES & TESTS | | | Water | STRATA | | | |
|---|---|---|---|---|---|---|---|
| Depth | Type | Test Result | | Ground Level | Legend | Depth (Thickness) | DESCRIPTION |
| | | | | 47.28 | | (0.43) 0.43 | TOPSOIL: Dark brown clay. Many rootlets. |
| | | | | 46.11 | | (1.17) 1.60 | Firm to stiff grey mottled brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded coal sandstone and mudstone. |

### GENERAL REMARKS

Dry and stable on completion.
BRE Infiltration testing undertaken.

| All dimensions in metres Scale 1:25 | Contractor: Spektral | Method/ Plant Used JCB 3CX | Logged By CRi |
|---|---|---|---|

ROBSON LIDDLE TP 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## TRIAL PIT LOG

| Project: Lytham Road | | | TRIAL PIT No.: TP8 |
|---|---|---|---|
| Job No.: 12-12-16-1-1163 | Date Start 14-10-15 End 14-10-15 | Ground Level: (m) 47.67 | Co-Ordinates: () |
| Client Manchester City Council | | | Sheet: 1 of 1 |

| SAMPLES & TESTS | | | Water | STRATA | | | |
|---|---|---|---|---|---|---|---|
| Depth | Type | Test Result | | Ground Level | Legend | Depth (Thickness) | DESCRIPTION |
| 0.10 | ES | | | 47.27 | | (0.40) 0.40 | TOPSOIL: Dark brown clay. Many rootlets. |
| | | | | 46.77 | | (0.50) 0.90 | Firm to stiff grey mottled brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded sandstone and mudstone. Occasional mudstone cobble. Sandy Silt partings. |
| 1.10 | D | | | | | (2.10) | Stiff beoming very stiff grey and brown finely laminated gravelly CLAY. Gravel is fine to medium subangular to subrounded mudstone, sandstone and coal. |
| | | | | 44.67 | | 3.00 | |

### GENERAL REMARKS

Dry and stable on completion.
Backfilled with arisings.

| All dimensions in metres Scale 1:43.75 | Contractor: Spektral | Method/ Plant Used Windowless Sampling | Logged By CRi |
|---|---|---|---|

ROBSON LIDDLE TP 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## BOREHOLE LOG

| Project: Lytham Road | | | BOREHOLE No.: WS1 |
|---|---|---|---|
| Job No: 12-12-16-1-1163 | Date Start 15-10-15 End 15-10-15 | Ground Level: (m) 46.15 | Co-Ordinates: () |
| Client: Manchester City Council | | | Sheet: 1 of 1 |

| SAMPLES & TESTS | | | Water | STRATA | | | | Instrument/ Backfill |
|---|---|---|---|---|---|---|---|---|
| Depth | Type | Test Result | | Ground Level | Legend | Depth (Thickness) | DESCRIPTION | |
| | | | | 46.05 | | 0.10 | MADE GROUND: Bitumen | |
| | | | | 45.90 | | 0.25 | MADE GROUND: Dark brown fine to coarse gravel. Gravel is subangular to subrounded clinker, coal and tarmac. | |
| | | | | 45.80 | | 0.35 | MADE GROUND: Orange brown fine to medium gravel. Gravel is subangular shale. | |
| 0.40 | ES | | | 45.65 | | 0.50 | MADE GROUND: Black fine to medium gravel. Gravel is subangular clinker. | |
| 0.70 | ES | | | | | (0.30) | | |
| 0.80 | D | | | 45.35 | | 0.80 | Firm dark grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subrounded sandstone and coal. | |
| 1.00 | | SPT N10 | | | | | Firm grey mottled brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded sandstone and mudstone. Occassional cobble. 1.00 ... becoming stiff | |
| 1.60 | D | | | | | (1.60) | | |
| 2.00 | | SPT N25 | | | | | 1.90 ... becoming very stiff | |
| | | | | 43.75 | | 2.40 | | |
| | | | | | | | Very stiff brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium, occassionally coarse subangular to subrounded sandstone, coal and mudstone. | |
| 3.00 | | SPT N36 | | | | (1.60) | | |
| | | | | 42.15 | | 4.00 | | |
| 4.00 | | SPT N25 | | | | | | |

| Boring Progress and Water Observations | | | | | | GENERAL REMARKS |
|---|---|---|---|---|---|---|
| Date | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt | |
| | | | | | | Dry on completion. Backfilled with arisings. Dynamic Probe DP1 undertaken adjacent. |

| All dimensions in metres Scale 1:31.25 | Contractor: Spektral | Method/ Plant Used: Windowless Sampling | Logged By: CRi |
|---|---|---|---|

ROBSON LIDDLE WS 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## BOREHOLE LOG

| Project: Lytham Road | | | BOREHOLE No.: WS2 |
|---|---|---|---|
| Job No: 12-12-16-1-1163 | Date Start 15-10-15 End 15-10-15 | Ground Level: (m) 46.07 | Co-Ordinates: () |
| Client: Manchester City Council | | | Sheet: 1 of 1 |

| SAMPLES & TESTS | | | Water | STRATA | | | | Instrument/ Backfill |
|---|---|---|---|---|---|---|---|---|
| Depth | Type | Test Result | | Ground Level | Legend | Depth (Thickness) | DESCRIPTION | |
| | | | | 45.97 | | 0.10 | MADE GROUND: Bitumen | |
| | | | | 45.87 | | 0.20 | MADE GROUND: Orange brown fine to medium gravel. Gravel is subangular shale. | |
| 0.15 | ES | | | 45.62 | | (0.25) 0.45 | MADE GROUND: Black fine to medium gravel. Gravel is subangular sandstone, coal and clinker. | |
| 0.50 | ES | | | | | | Firm grey and brown mottled slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subrounded sandstone and coal. | |
| 1.00 | | SPT N10 | | | | (1.55) | 1.20 ... becoming stiff | |
| | | | | 44.07 | | 2.00 | | |
| 2.00 | | SPT N26 | | | | | Very stiff brown gravelly CLAY. Gravel is medium to coarse subangular to subrounded sandstone, coal and mudstone. | |
| 3.00 | | SPT N43 | | | | (2.00) | 3.55 - 3.65 ... sand layer | |
| | | | | 42.07 | | 4.00 | | |
| 4.00 | | SPT N26 | | | | | | |

| Boring Progress and Water Observations | | | | | | GENERAL REMARKS |
|---|---|---|---|---|---|---|
| Date | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt | |
| | | | | | | Dry on completion. Backfilled with arisings.<br>Dynamic Probe DP2 undertaken adjacent. |

| All dimensions in metres Scale 1:31.25 | Contractor: Spektral | Method/ Plant Used: Windowless Sampling | Logged By: CRi |
|---|---|---|---|

ROBSON LIDDLE WS 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## BOREHOLE LOG

| Project: Lytham Road | | | BOREHOLE No.: WS3 |
|---|---|---|---|
| Job No: 12-12-16-1-1163 | Date Start 16-10-15 End 16-10-15 | Ground Level: (m) 46.37 | Co-Ordinates: () |
| Client: Manchester City Council | | | Sheet: 1 of 1 |

| SAMPLES & TESTS | | | Water | STRATA | | | | Instrument/ Backfill |
|---|---|---|---|---|---|---|---|---|
| Depth | Type | Test Result | | Ground Level | Legend | Depth (Thickness) | DESCRIPTION | |
| | | | | | | | TOPSOIL: Dark brown clay. Many rootlets. | |
| 0.20 | ES | | | 45.97 | | (0.40) 0.40 | | |
| 0.45 | | HV 87 kPa | | | | | Firm brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded sandstone and mudstone. | |
| 0.60 | | HV 96 kPa | | | | | | |
| 0.70 | D | | | | | | | |
| 0.80 | | HV 120+ kPa | | | | | | |
| 1.00 | | SPT N10 | | | | (1.70) | | |
| 1.40 | | HV 71 kPa | | | | | | |
| 1.60 | | HV 109 kPa | | | | | | |
| 1.80 | | HV 116 kPa | | | | | | |
| 2.00 | | SPT N29 | | 44.27 | | 2.10 | | |
| | | | | | | | Very stiff to hard brown gravelly CLAY. Gravel is fine to medium subangular to surbounded mustone, quartz, sandstone and coal. | |
| 2.50 | | HV 120+ kPa | | | | (0.90) | | |
| 2.80 | | HV 120+ kPa | | 43.37 | | 3.00 | | |
| 3.00 | | SPT N48 | | | | | | |

| Boring Progress and Water Observations | | | | | | GENERAL REMARKS |
|---|---|---|---|---|---|---|
| Date | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt | |
| | | | | | | Dry on completion. Backfilled with arisings.<br>Dynamic Probe DP3 undertaken adjacent. |

| All dimensions in metres Scale 1:31.25 | Contractor: Spektral | Method/ Plant Used: Windowless Sampling | Logged By: CRi |
|---|---|---|---|

ROBSON LIDDLE WS 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## BOREHOLE LOG

| Project: Lytham Road | | | BOREHOLE No.: WS4 |
|---|---|---|---|
| Job No: 12-12-16-1-1163 | Date Start 15-10-15 End 15-10-15 | Ground Level: (m) 46.37 | Co-Ordinates: () |
| Client: Manchester City Council | | | Sheet: 1 of 1 |

| SAMPLES & TESTS | | | Water | STRATA | | | | Instrument/ Backfill |
|---|---|---|---|---|---|---|---|---|
| Depth | Type | Test Result | | Ground Level | Legend | Depth (Thickness) | DESCRIPTION | |
| 0.10 | ES | | | 46.07 | | (0.30) 0.30 | TOPSOIL: Dark brown clay. Many rootlets. | |
| | | | | 45.97 | | 0.40 | Grey slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded sandstone, mudstone and coal. | |
| 0.70 | ES | | | | | | Firm to stiff grey mottled brown slightly sandy slightly gravelly CLAY. Gravel is fine to caorse subangular to subrounded sandstone and mudstone. | |
| 0.90 | D | | | | | | | |
| 1.00 | | SPT N10 | | | | (1.60) | | |
| 1.50 | D | | | | | | | |
| | | | | 44.37 | | 2.00 | | |
| 2.00 | | SPT N41 | | | | (0.60) | Very stiff to hard brown gravelly CLAY. Gravel is fine to medium subangular to surbounded mustone, quartz, sandstone and coal. | |
| | | | | 43.77 | | 2.60 | | |
| 2.60 | | SPT N72 | | | | | | |

| Boring Progress and Water Observations | | | | | | GENERAL REMARKS |
|---|---|---|---|---|---|---|
| Date | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt | |
| | | | | | | Dry on completion.<br>Gas/groundwater monitoring well installed (0.6m plain, 2m slotted).<br>Dynamic Probe DP4 undertaken adjacent. |

| All dimensions in metres Scale 1:31.25 | Contractor: Spektral | Method/ Plant Used: Windowless Sampling | Logged By: CRi |
|---|---|---|---|

ROBSON LIDDLE WS 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## BOREHOLE LOG

| Project: Lytham Road | | | BOREHOLE No.: WS5 |
|---|---|---|---|
| Job No: 12-12-16-1-1163 | Date Start 15-10-15 End 15-10-15 | Ground Level: (m) 46.45 | Co-Ordinates: () |
| Client: Manchester City Council | | | Sheet: 1 of 1 |

| SAMPLES & TESTS | | | Water | STRATA | | | | |
|---|---|---|---|---|---|---|---|---|
| Depth | Type | Test Result | | Ground Level | Legend | Depth (Thickness) | DESCRIPTION | Instrument/ Backfill |
| | | | | 46.20 | | (0.25) 0.25 | TOPSOIL: Dark brown clay. Many rootlets. | |
| 0.20 | ES | | | 46.05 | | 0.40 | Grey slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded sandstone, mudstone and coal. | |
| 0.40 | ES | | | | | | Firm brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine to caorse subangular to subrounded sandstone and mudstone. | |
| 1.00 | | SPT N13 | | | | (1.40) | 1.00 ... becoming stiff. | |
| 1.10 | D | | | | | | | |
| 1.20 | ES | | | 44.65 | | 1.80 | | |
| 2.00 | | SPT N36 | | | | (1.20) | Very stiff to hard brown gravelly CLAY. Gravel is fine to medium subangular to surbounded mustone, quartz, sandstone and coal. | |
| | | | | 43.45 | | 3.00 | | |
| 3.00 | | SPT N43 | | | | | | |

| Boring Progress and Water Observations | | | | | | GENERAL REMARKS |
|---|---|---|---|---|---|---|
| Date | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt | |
| | | | | | | Dry on completion. Backfilled with arisings.<br>Dynamic Probe DP5 undertaken adjacent. |

| All dimensions in metres Scale 1:31.25 | Contractor: Spektral | Method/ Plant Used: Windowless Sampling | Logged By: CRi |
|---|---|---|---|

ROBSON LIDDLE WS 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## BOREHOLE LOG

| Project: Lytham Road | | | BOREHOLE No.: WS6 |
|---|---|---|---|
| Job No: 12-12-16-1-1163 | Date Start 16-10-15 End 16-10-15 | Ground Level: (m) 47.10 | Co-Ordinates: () |
| Client: Manchester City Council | | | Sheet: 1 of 1 |

| SAMPLES & TESTS | | | Water | STRATA | | | | Instrument/ Backfill |
|---|---|---|---|---|---|---|---|---|
| Depth | Type | Test Result | | Ground Level | Legend | Depth (Thickness) | DESCRIPTION | |
| | | | | 46.90 | | 0.20 | TOPSOIL: Dark brown clay. Many rootlets. | |
| 0.15 | ES | | | 46.70 | | 0.40 | Firm to stiff dark grey CLAY. | |
| 0.40 | | HV 88 kPa | | 46.45 | | (0.25) 0.65 | Yellow brown and grey mottled slightly gravelly CLAY. Gravel is medium subrounded sandstone. | |
| 0.60 | | HV 98 kPa | | | | | Firm brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded sandstone and mudstone. | |
| 0.80 | | HV 117 kPa | | | | | | |
| 1.00 | ES | | | | | | 1.00 ... becoming stiff. | |
| 1.00 | | SPT N8 | | | | | | |
| 1.15 | | HV 116 kPa | | | | (1.35) | | |
| 1.30 | | HV 120+ kPa | | | | | | |
| 1.50 | | HV 120+ kPa | | | | | | |
| 1.70 | | HV 120+ kPa | | 45.10 | | 2.00 | | |
| 2.00 | | SPT N35 | | | | | Very stiff to hard brown gravelly CLAY. Gravel is fine to medium subangular to surbounded mustone, quartz, sandstone and coal. | |
| | | | | | | (1.00) | | |
| | | | | 44.10 | | 3.00 | | |
| 3.00 | | SPT N52 | | | | | | |

| Boring Progress and Water Observations | | | | | | GENERAL REMARKS |
|---|---|---|---|---|---|---|
| Date | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt | |
| | | | | | | Dry on completion.<br>Gas/groundwater monitoring well installed (0.8m plain, 2m slotted).<br>Dynamic Probe DP6 undertaken adjacent. |

| All dimensions in metres Scale 1:31.25 | Contractor: Spektral | Method/ Plant Used: Windowless Sampling | Logged By: CRi |
|---|---|---|---|

ROBSON LIDDLE WS 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## BOREHOLE LOG

| Project: Lytham Road | | | BOREHOLE No.: WS7 |
|---|---|---|---|
| Job No: 12-12-16-1-1163 | Date Start 16-10-15 End 16-10-15 | Ground Level: (m) 47.23 | Co-Ordinates: () |
| Client: Manchester City Council | | | Sheet: 1 of 1 |

| SAMPLES & TESTS | | | Water | STRATA | | | | Instrument/ Backfill |
|---|---|---|---|---|---|---|---|---|
| Depth | Type | Test Result | | Ground Level | Legend | Depth (Thickness) | DESCRIPTION | |
| | | | | | | | TOPSOIL: Dark brown clay. Many rootlets. | |
| 0.20 | ES | | | 46.83 | | (0.40) 0.40 | | |
| 0.40 | | HV 87 kPa | | | | | MADE GROUND: Dark orange brown and grey gravelly clay. Gravel is fine to medium sandstone, ceramic, glass and brick. Occassional brick cobble. | |
| 0.50 | ES | | | | | (0.50) | | |
| 0.70 | | HV 63 kPa | | | | | | |
| 0.80 | | HV 63 kPa | | 46.33 | | 0.90 | | |
| 0.90 | | HV 116 kPa | | | | | Firm to stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded sandstone and mudstone. | |
| 1.00 | | SPT N10 | | | | | | |
| 1.10 | | HV 62 kPa | | | | | | |
| 1.30 | | HV 76 kPa | | | | | | |
| 1.50 | | HV 120+ kPa | | | | | | |
| 1.70 | | HV 120+ kPa | | | | (2.10) | | |
| 2.00 | | SPT N33 | | | | | 2.00 ... becoming very stiff. | |
| | | | | 44.23 | | 3.00 | | |
| 3.00 | | SPT N50 | | | | | | |

| Boring Progress and Water Observations | | | | | | GENERAL REMARKS |
|---|---|---|---|---|---|---|
| Date | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt | |
| | | | | | | Dry on completion. Backfilled with arisings.<br>Dynamic Probe DP7 undertaken adjacent. |

| All dimensions in metres Scale 1:31.25 | Contractor: Spektral | Method/ Plant Used: Windowless Sampling | Logged By: CRi |
|---|---|---|---|

ROBSON LIDDLE WS 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## BOREHOLE LOG

| Project: Lytham Road | | | BOREHOLE No.: WS9 |
|---|---|---|---|
| Job No: 12-12-16-1-1163 | Date Start 16-10-15 End 16-10-15 | Ground Level: (m) 47.53 | Co-Ordinates: () |
| Client: Manchester City Council | | | Sheet: 1 of 1 |

| SAMPLES & TESTS | | | Water | STRATA | | | | Instrument/ Backfill |
|---|---|---|---|---|---|---|---|---|
| Depth | Type | Test Result | | Ground Level | Legend | Depth (Thickness) | DESCRIPTION | |
| 0.10 | ES | | | 47.13 | | (0.40) 0.40 | TOPSOIL: Dark brown clay. Many rootlets. | |
| 0.40 | ES | | | 47.03 | | 0.50 | MADE GROUND: Dark brown medium to coarse gravel. Gravel is sandstone, clinker, ceramic, glass, coal and brick. Occassional brick cobble. | |
| 0.70 | | HV 57 kPa | | 46.83 | | 0.70 | Brownish grey clayey SAND. | |
| 0.80 | | HV 108 kPa | | 46.73 | | 0.80 | Brownish grey sandy CLAY. | |
| 0.90 | ES | | | | | | Firm to stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded sandstone and mudstone. | |
| 0.90 | | HV 120+ kPa | | | | | | |
| 1.00 | D | | | | | | | |
| 1.00 | | SPT N12 | | | | | | |
| 1.20 | | HV 72 kPa | | | | (1.00) | | |
| 1.50 | | HV 120+ kPa | | 45.73 | | 1.80 | | |
| 2.00 | D | | | | | | Very stiff to hard brown gravelly CLAY. Gravel is fine to medium subangular to subrounded mudstone, quartz, sandstone and coal. | |
| 2.00 | | SPT N30 | | | | | 1.80 ...cobble of mudstone. | |
| 2.60 | | HV 120+ kPa | | 44.53 | | (1.20) 3.00 | | |
| 3.00 | | SPT N56 | | | | | | |

| Boring Progress and Water Observations | | | | | | GENERAL REMARKS |
|---|---|---|---|---|---|---|
| Date | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt | |
| | | | | | | Dry on completion.<br>Gas/groundwater monitoring well installed (1m plain, 2m slotted)<br>Dynamic Probe DP9 undertaken adjacent. |

| All dimensions in metres Scale 1:31.25 | Contractor: Spektral | Method/ Plant Used: Windowless Sampling | Logged By: CRi |
|---|---|---|---|

ROBSON LIDDLE WS 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## BOREHOLE LOG

| Project: Lytham Road | | | BOREHOLE No.: WS10 |
|---|---|---|---|
| Job No: 12-12-16-1-1163 | Date Start 16-10-15 End 16-10-15 | Ground Level: (m) 47.48 | Co-Ordinates: () |
| Client: Manchester City Council | | | Sheet: 1 of 1 |

| SAMPLES & TESTS | | | Water | STRATA | | | | Instrument/ Backfill |
|---|---|---|---|---|---|---|---|---|
| Depth | Type | Test Result | | Ground Level | Legend | Depth (Thickness) | DESCRIPTION | |
| 0.15 | ES | | | 47.13 | | (0.35) 0.35 | TOPSOIL: Dark brown clay. Many rootlets. | |
| 0.40 | | HV 68 kPa | | | | (0.35) | Firm to stiff dark grey slightly gravelly CLAY. Gravel is fine to medium subangular coal. | |
| 0.60 | D | | | 46.78 | | 0.70 | | |
| 0.60 | | HV 79 kPa | | | | | Firm brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded sandstone and mudstone. | |
| 0.80 | | HV 96 kPa | | | | | | |
| 0.90 | | HV 120+ kPa | | | | | | |
| 1.00 | | SPT N8 | | | | (1.50) | | |
| 1.50 | | HV 120+ kPa | | | | | | |
| 2.00 | | SPT N39 | | 45.28 | | 2.20 | | |
| 2.20 | | HV 120+ kPa | | | | (0.80) | Very stiff to hard brown gravelly CLAY. Gravel is fine to medium subangular to surbounded mustone, quartz, sandstone and coal. | |
| 3.00 | | SPT N58 | | 44.48 | | 3.00 | | |

| Boring Progress and Water Observations | | | | | | GENERAL REMARKS |
|---|---|---|---|---|---|---|
| Date | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt | |
| | | | | | | Dry on completion. Backfilled with arisings.<br>Dynamic Probe DP10 undertaken adjacent. |

| All dimensions in metres Scale 1:31.25 | Contractor: Spektral | Method/ Plant Used: Windowless Sampling | Logged By: CRi |
|---|---|---|---|

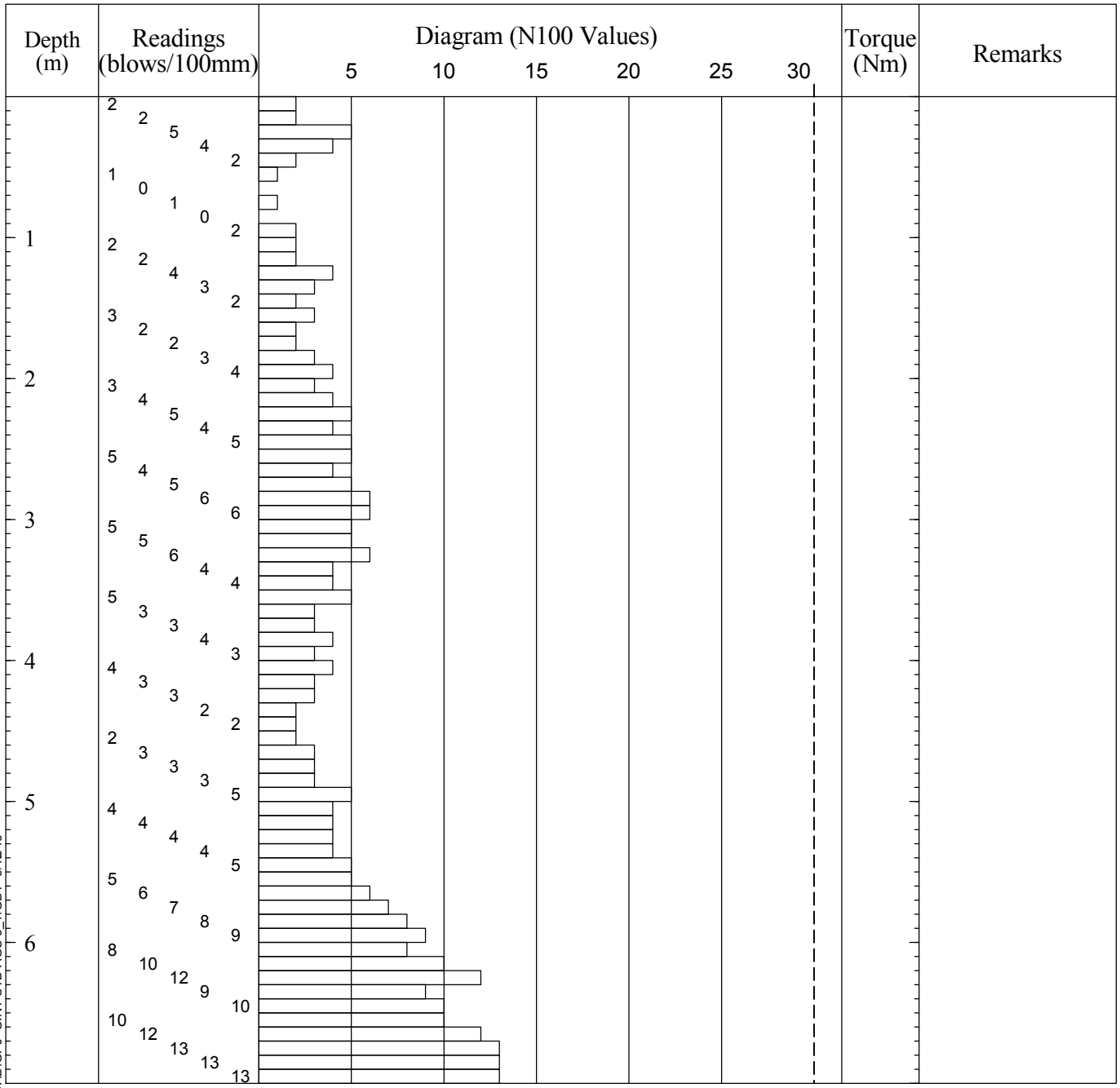
ROBSON LIDDLE WS 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## DYNAMIC PROBE LOG

| Project: | | | | PROBE No |
|---|---|---|---|---|
| Lytham Road | | | | **DP1** |
| Job No: 12-12-16-1-1163 | Date: 15-10-15 15-10-15 | Ground Level (m) | Co-Ordinates () | |
| Client: Manchester City Council | | | | Sheet 1 of 1 |




| | |
|---|---|
| Hammer Wt (kg) | |
| Hammer Drop (mm) | |
| Cone Dia (mm) | |
| Cone Type | |
| Damper | |

GENERAL REMARKS

| All dimensions in metres Scale 1:43.75 | Contractor: Spektral | Method/ Plant Used: Windowless Sampling | Logged By: |
|---|---|---|---|

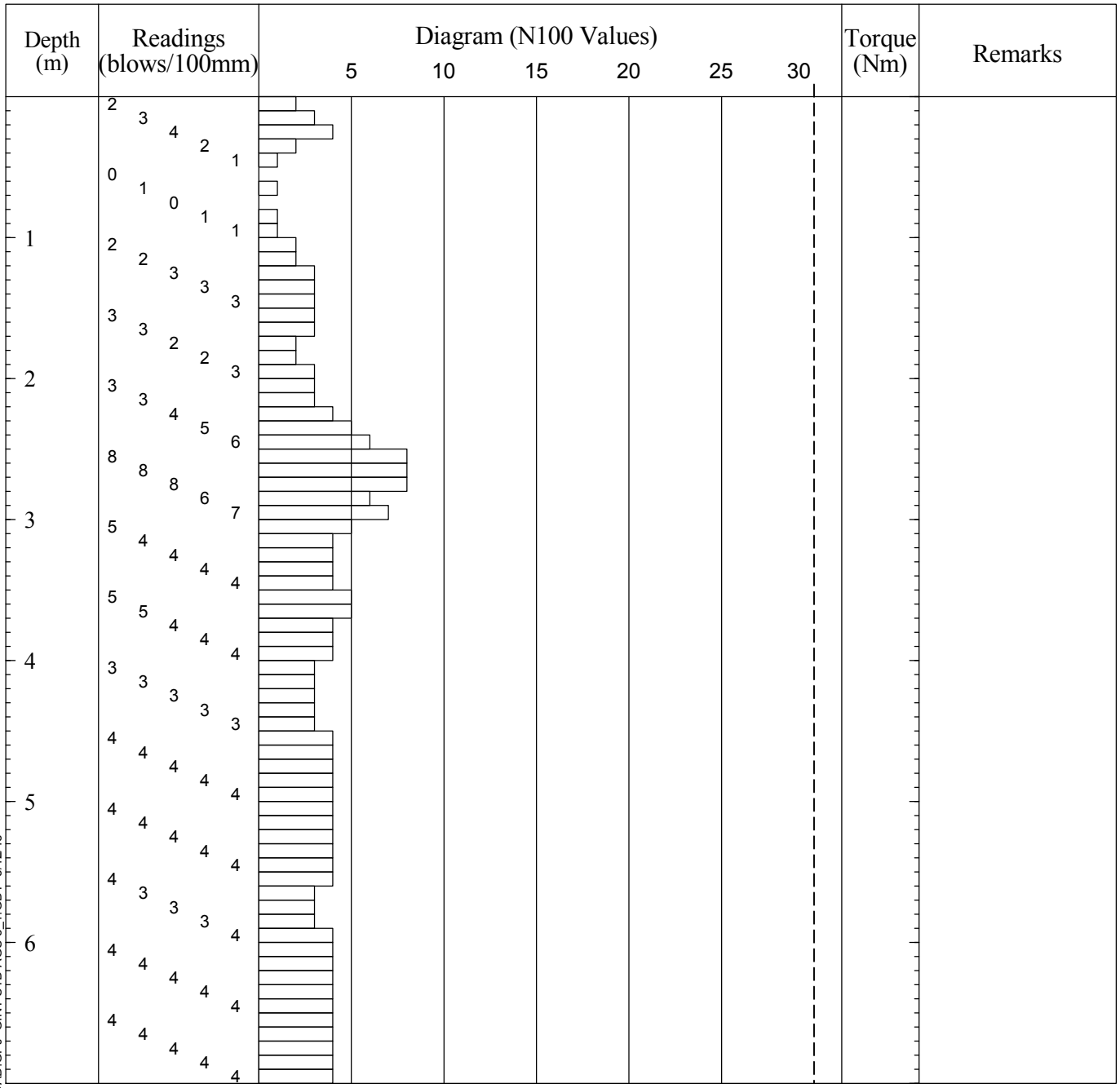
ROBSON LIDDLE DP 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## DYNAMIC PROBE LOG

| Project: | | | | PROBE No |
|---|---|---|---|---|
| Lytham Road | | | | **DP2** |
| Job No: 12-12-16-1-1163 | Date: 15-10-15 15-10-15 | Ground Level (m) | Co-Ordinates () | |
| Client: Manchester City Council | | | | Sheet 1 of 1 |




| | |
|---|---|
| Hammer Wt (kg) | |
| Hammer Drop (mm) | |
| Cone Dia (mm) | |
| Cone Type | |
| Damper | |

GENERAL REMARKS

| All dimensions in metres Scale 1:43.75 | Contractor: Spektral | Method/ Plant Used: Windowless Sampling | Logged By: |
|---|---|---|---|

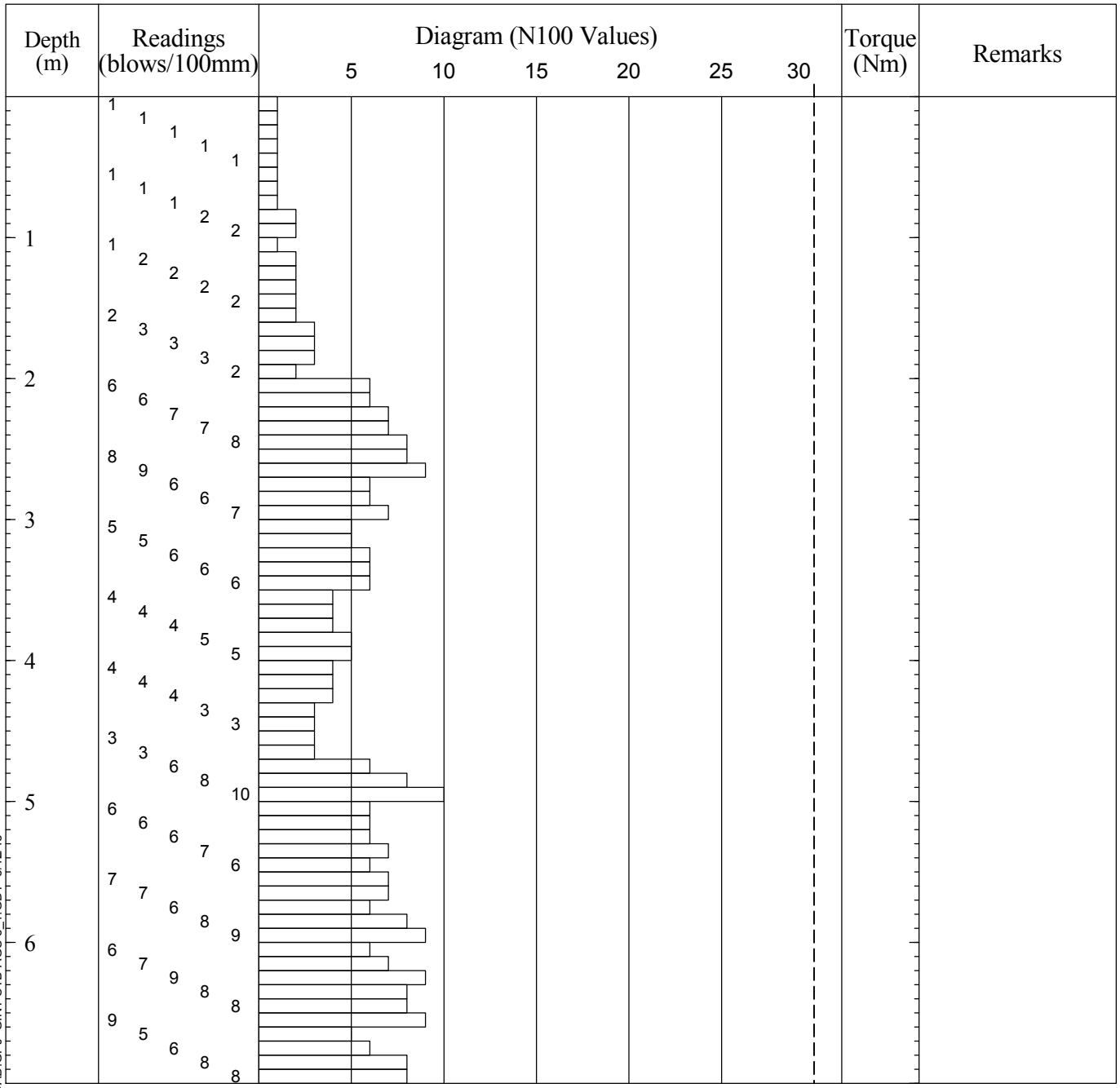
ROBSON LIDDLE DP 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## DYNAMIC PROBE LOG

| Project: | | | | PROBE No |
|---|---|---|---|---|
| Lytham Road | | | | DP3 |
| Job No: 12-12-16-1-1163 | Date: 16-10-15 16-10-15 | Ground Level (m) | Co-Ordinates () | |
| Client: Manchester City Council | | | | Sheet 1 of 1 |




| | |
|---|---|
| Hammer Wt (kg) | |
| Hammer Drop (mm) | |
| Cone Dia (mm) | |
| Cone Type | |
| Damper | |

GENERAL REMARKS

| All dimensions in metres Scale 1:43.75 | Contractor: Spektral | Method/ Plant Used: Windowless Sampling | Logged By: |
|---|---|---|---|

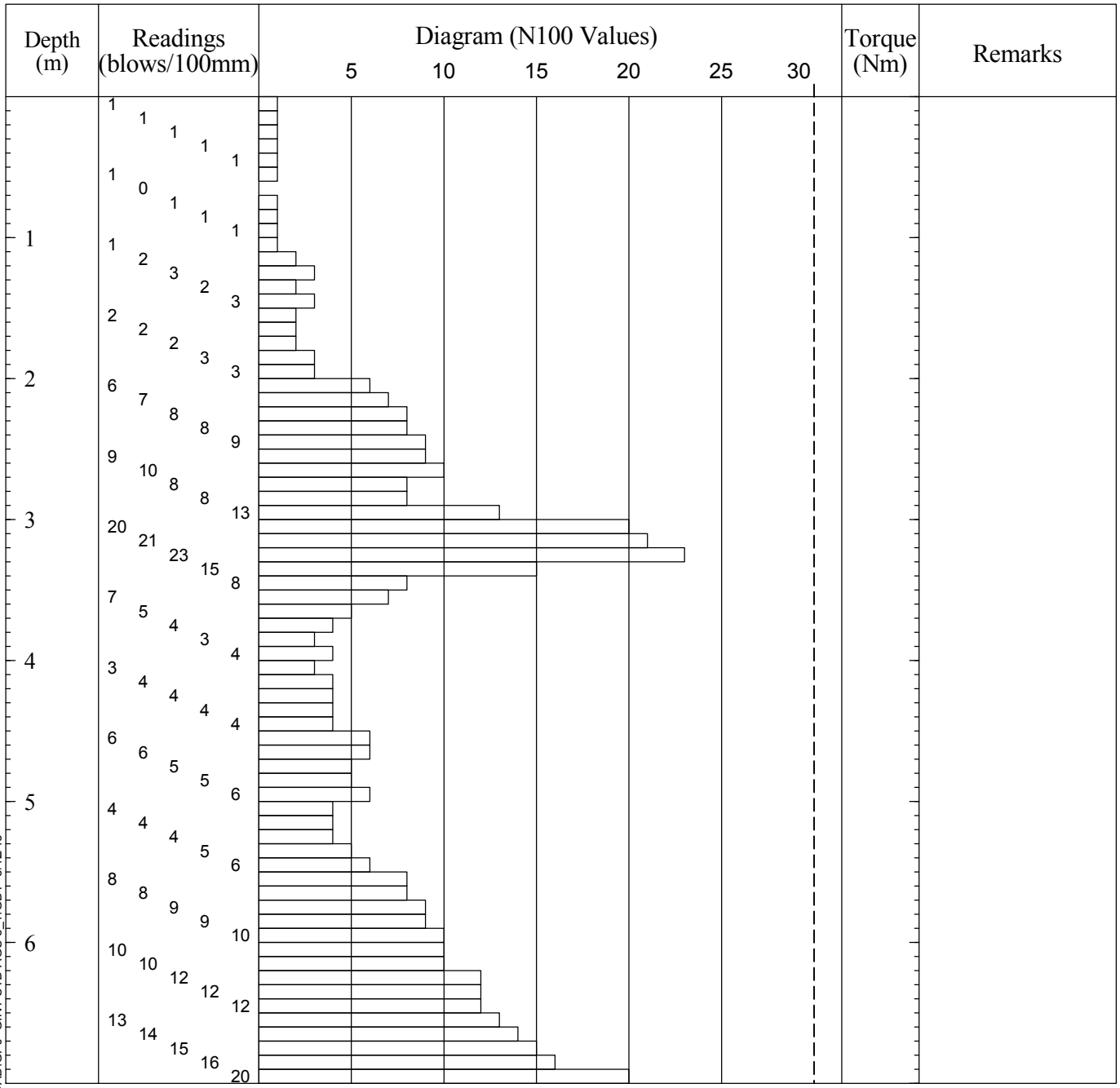
ROBSON LIDDLE DP 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## DYNAMIC PROBE LOG

| Project: | | | | PROBE No |
|---|---|---|---|---|
| Lytham Road | | | | DP4 |
| Job No: 12-12-16-1-1163 | Date: 15-10-15 15-10-15 | Ground Level (m) | Co-Ordinates () | |
| Client: Manchester City Council | | | | Sheet 1 of 1 |




| | |
|---|---|
| Hammer Wt (kg) | |
| Hammer Drop (mm) | |
| Cone Dia (mm) | |
| Cone Type | |
| Damper | |

GENERAL REMARKS

| All dimensions in metres Scale 1:43.75 | Contractor: Spektral | Method/ Plant Used: Windowless Sampling | Logged By: |
|---|---|---|---|

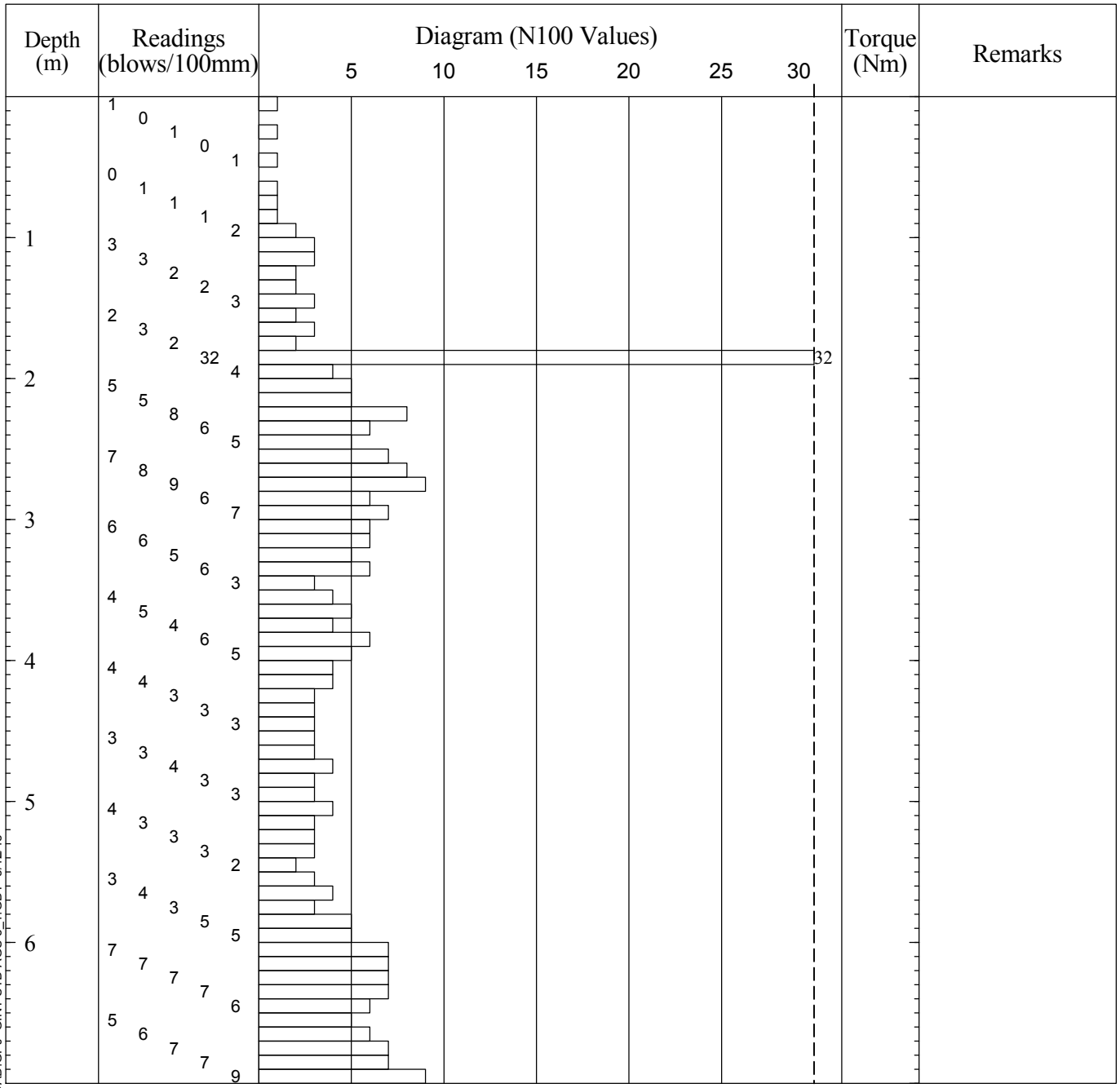
ROBSON LIDDLE DP 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## DYNAMIC PROBE LOG

| Project: | | | | PROBE No |
|---|---|---|---|---|
| Lytham Road | | | | **DP5** |
| Job No: 12-12-16-1-1163 | Date: 15-10-15 15-10-15 | Ground Level (m) | Co-Ordinates () | |
| Client: Manchester City Council | | | | Sheet 1 of 1 |




| | |
|---|---|
| Hammer Wt (kg) | |
| Hammer Drop (mm) | |
| Cone Dia (mm) | |
| Cone Type | |
| Damper | |

GENERAL REMARKS

| All dimensions in metres Scale 1:43.75 | Contractor: Spektral | Method/ Plant Used: Windowless Sampling | Logged By: |
|---|---|---|---|

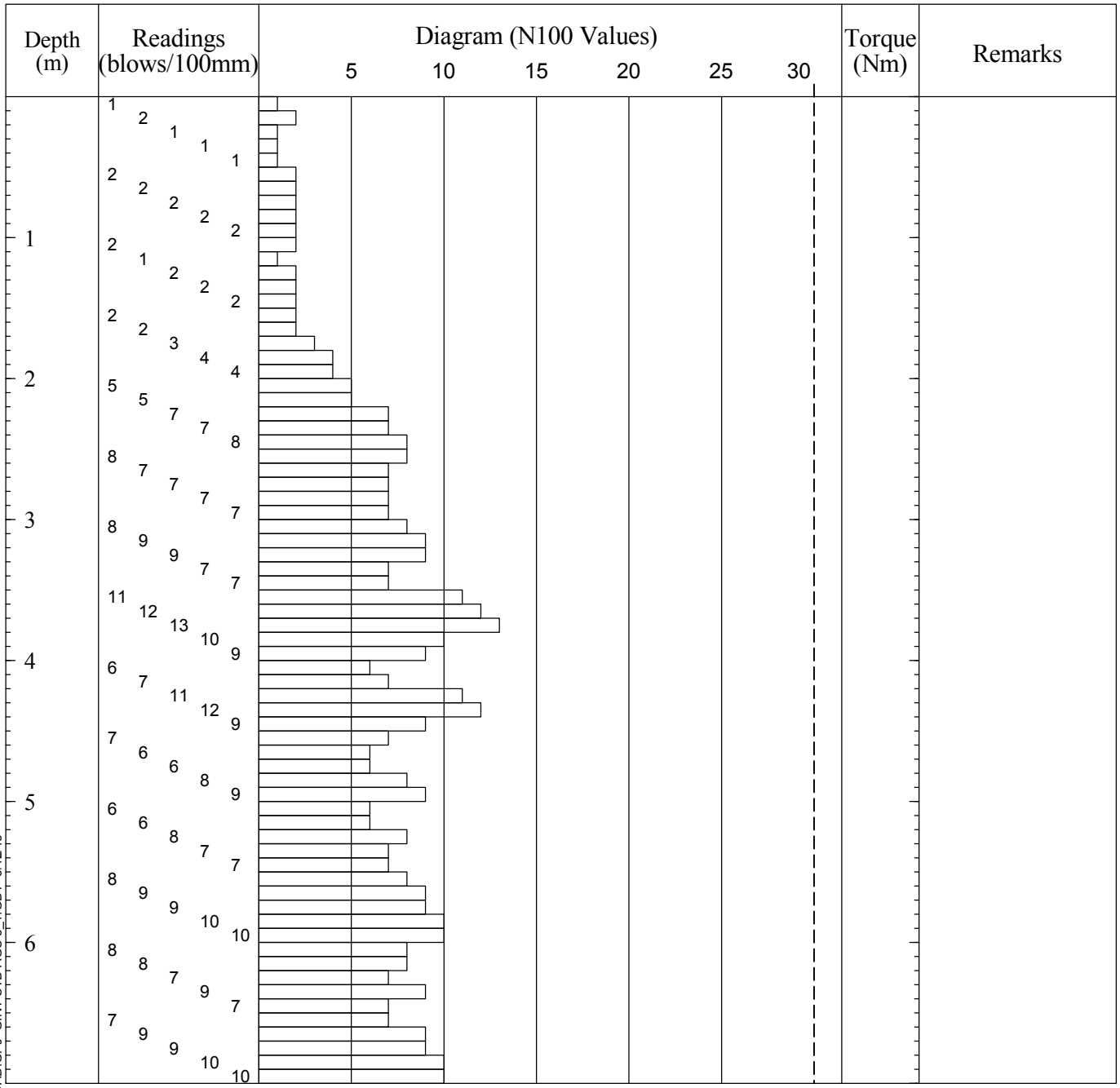
ROBSON LIDDLE DP 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## DYNAMIC PROBE LOG

| Project: | | | | PROBE No |
|---|---|---|---|---|
| Lytham Road | | | | **DP6** |
| Job No: 12-12-16-1-1163 | Date: 16-10-15 16-10-15 | Ground Level (m) | Co-Ordinates () | |
| Client: Manchester City Council | | | | Sheet 1 of 1 |




| | |
|---|---|
| Hammer Wt (kg) | |
| Hammer Drop (mm) | |
| Cone Dia (mm) | |
| Cone Type | |
| Damper | |

GENERAL REMARKS

| All dimensions in metres Scale 1:43.75 | Contractor: Spektral | Method/ Plant Used: Windowless Sampling | Logged By: |
|---|---|---|---|

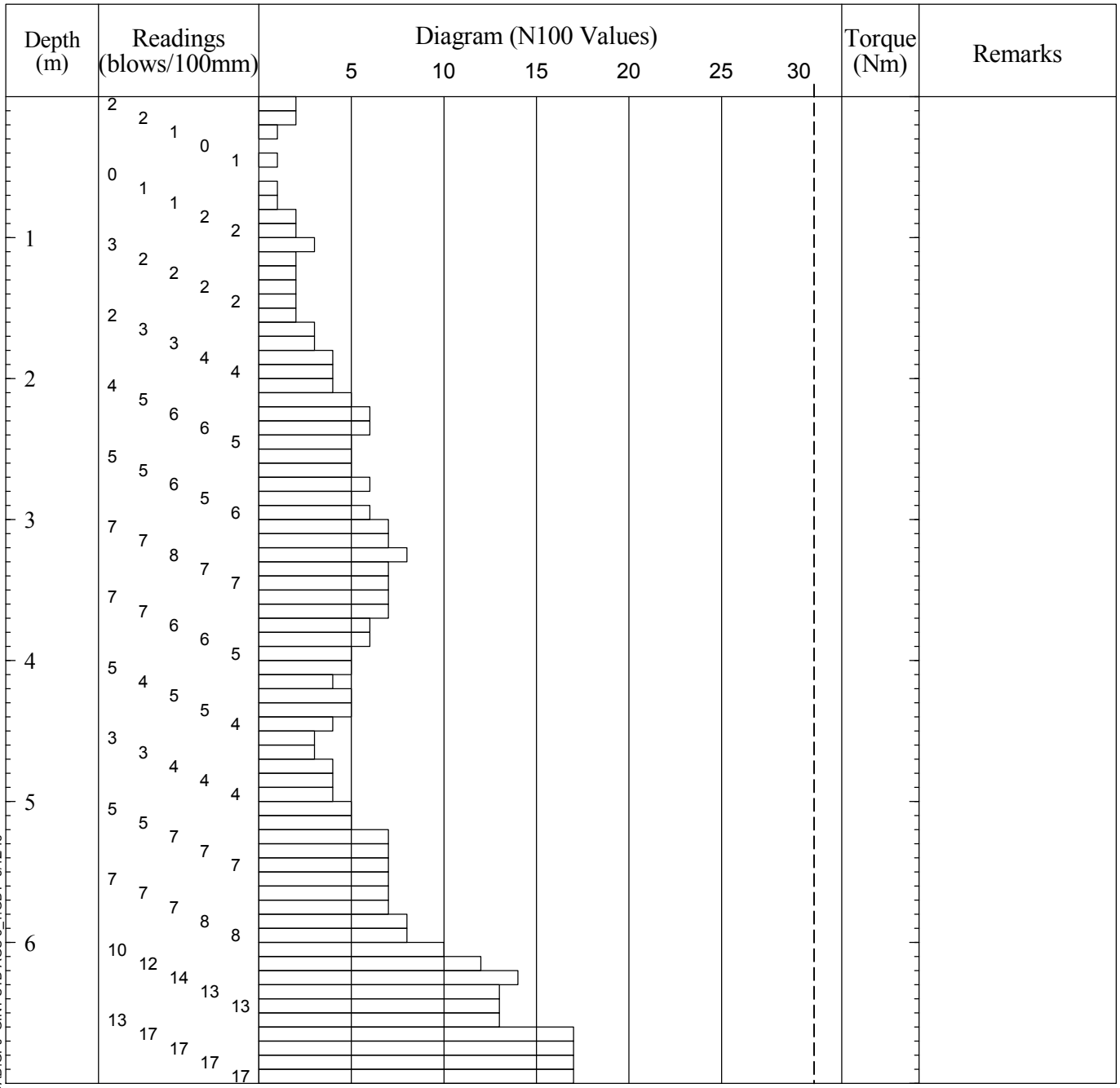
ROBSON LIDDLE DP 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## DYNAMIC PROBE LOG

| Project: Lytham Road | | | PROBE No DP7 |
|---|---|---|---|
| Job No: 12-12-16-1-1163 | Date: 16-10-15 16-10-15 | Ground Level (m) | Co-Ordinates () |
| Client: Manchester City Council | | | Sheet 1 of 1 |




| | |
|---|---|
| Hammer Wt (kg) | |
| Hammer Drop (mm) | |
| Cone Dia (mm) | |
| Cone Type | |
| Damper | |

GENERAL REMARKS

| All dimensions in metres Scale 1:43.75 | Contractor: Spektral | Method/ Plant Used: Windowless Sampling | Logged By: |
|---|---|---|---|

ROBSON LIDDLE DP 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## DYNAMIC PROBE LOG

| Project: | | | | PROBE No |
|---|---|---|---|---|
| Lytham Road | | | | **DP8** |
| Job No: 12-12-16-1-1163 | Date: 16-10-15 16-10-15 | Ground Level (m) | Co-Ordinates () | |
| Client: Manchester City Council | | | | Sheet 1 of 1 |

| Depth (m) | Readings (blows/100mm) | Diagram (N100 Values) 5 10 15 20 25 30 | Torque (Nm) | Remarks |
|---|---|---|---|---|
| 0 | 1 1 2 | | | |
| 1 | 2 3 3 | | | |
| 2 | 2 2 3 | | | |
| 3 | 2 3 4 | | | |
| 4 | 5 6 6 | | | |
| 5 | 6 7 7 | | | |
| 6 | 5 7 7 | | | |
| 7 | 6 6 6 | | | |
| 8 | 5 8 8 | | | |
| 9 | 3 4 8 | | | |
| 10 | 6 6 6 | | | |
| 11 | 3 4 4 | | | |
| 12 | 4 4 4 | | | |
| 13 | 4 4 4 | | | |
| 14 | 3 4 4 | | | |
| 15 | 4 8 6 | | | |
| 16 | 6 6 7 | | | |
| 17 | 6 6 6 | | | |
| 18 | 8 8 8 | | | |
| 19 | 5 7 8 | | | |
| 20 | 8 7 | | | |

| | |
|---|---|
| Hammer Wt (kg) | |
| Hammer Drop (mm) | |
| Cone Dia (mm) | |
| Cone Type | |
| Damper | |

GENERAL REMARKS

| All dimensions in metres Scale 1:43.75 | Contractor: Spektral | Method/ Plant Used: Windowless Sampling | Logged By: |
|---|---|---|---|

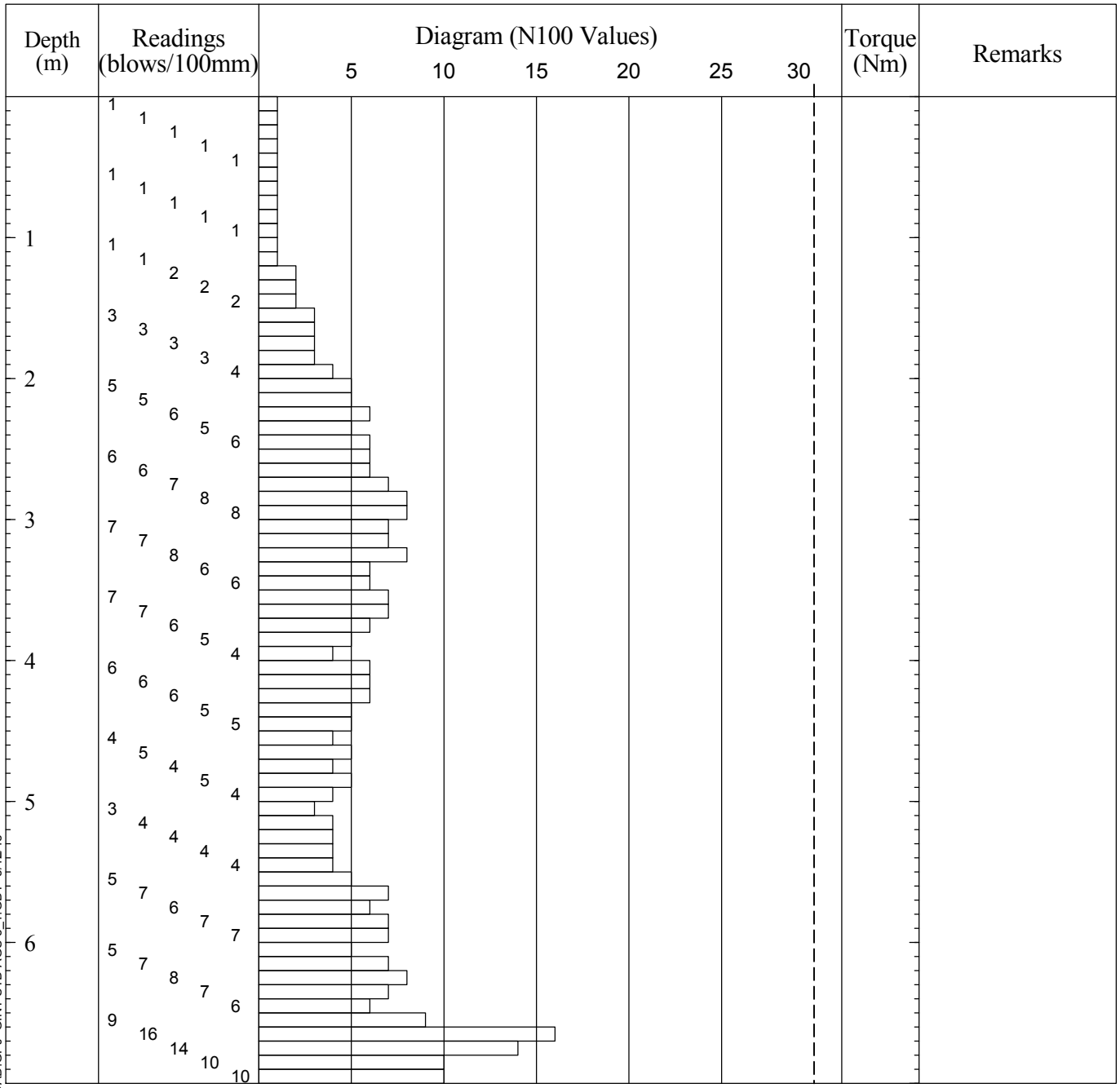
ROBSON LIDDLE DP 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## DYNAMIC PROBE LOG

| Project: | | | | PROBE No |
|---|---|---|---|---|
| Lytham Road | | | | **DP9** |
| Job No: 12-12-16-1-1163 | Date: 16-10-15 16-10-15 | Ground Level (m) | Co-Ordinates () | |
| Client: Manchester City Council | | | | Sheet 1 of 1 |




| | | GENERAL REMARKS |
|---|---|---|
| Hammer Wt (kg) | | |
| Hammer Drop (mm) | | |
| Cone Dia (mm) | | |
| Cone Type | | |
| Damper | | |

| All dimensions in metres Scale 1:43.75 | Contractor: Spektral | Method/ Plant Used: Windowless Sampling | Logged By: |
|---|---|---|---|

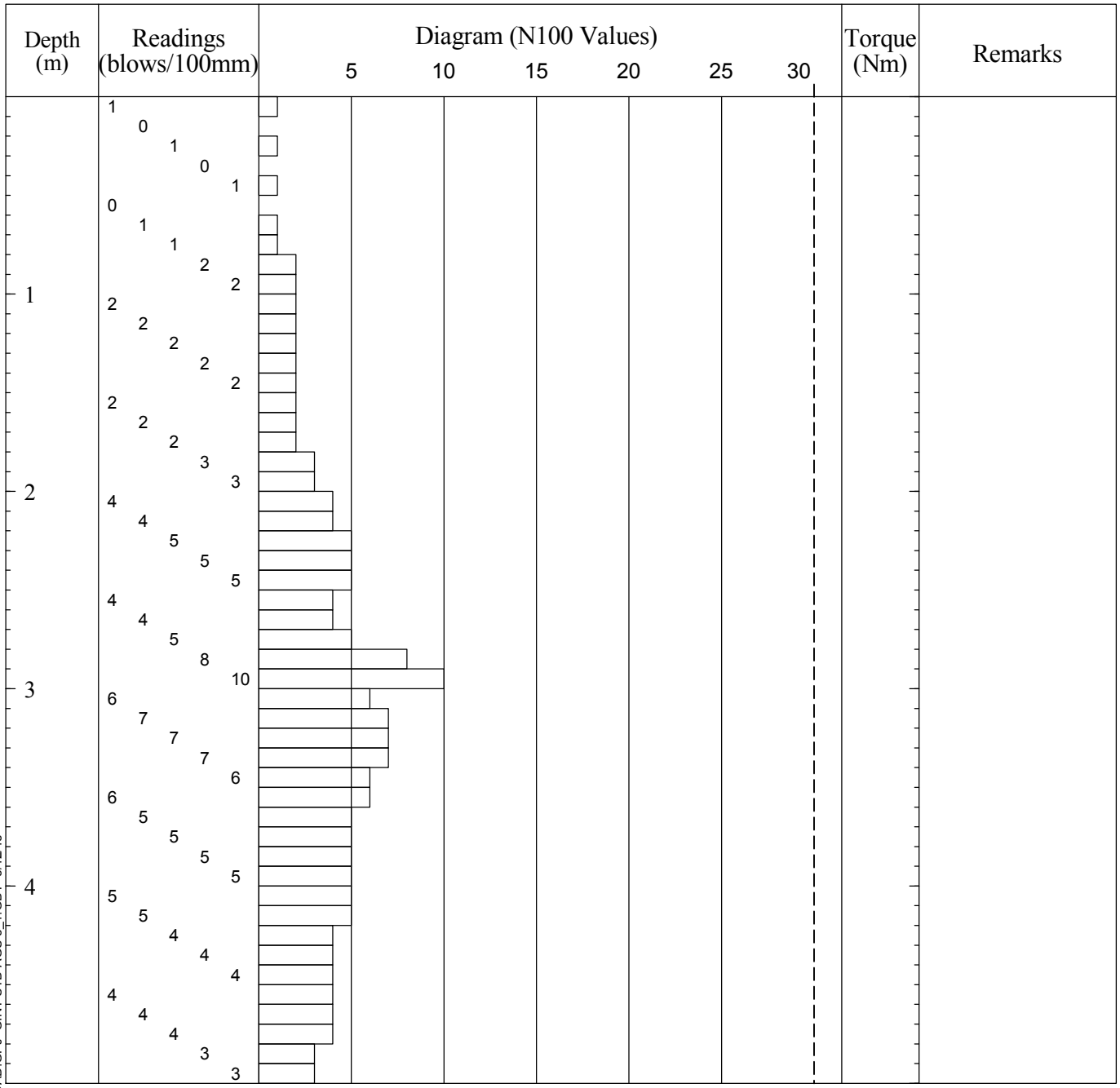
ROBSON LIDDLE DP 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## DYNAMIC PROBE LOG

| Project: Lytham Road | | | PROBE No DP10 |
|---|---|---|---|
| Job No: 12-12-16-1-1163 | Date: 16-10-15 16-10-15 | Ground Level (m) | Co-Ordinates () |
| Client: Manchester City Council | | | Sheet 1 of 2 |




| | |
|---|---|
| Hammer Wt (kg) | |
| Hammer Drop (mm) | |
| Cone Dia (mm) | |
| Cone Type | |
| Damper | |

GENERAL REMARKS

| All dimensions in metres Scale 1:31.25 | Contractor: Spektral | Method/ Plant Used: | Logged By: |
|---|---|---|---|

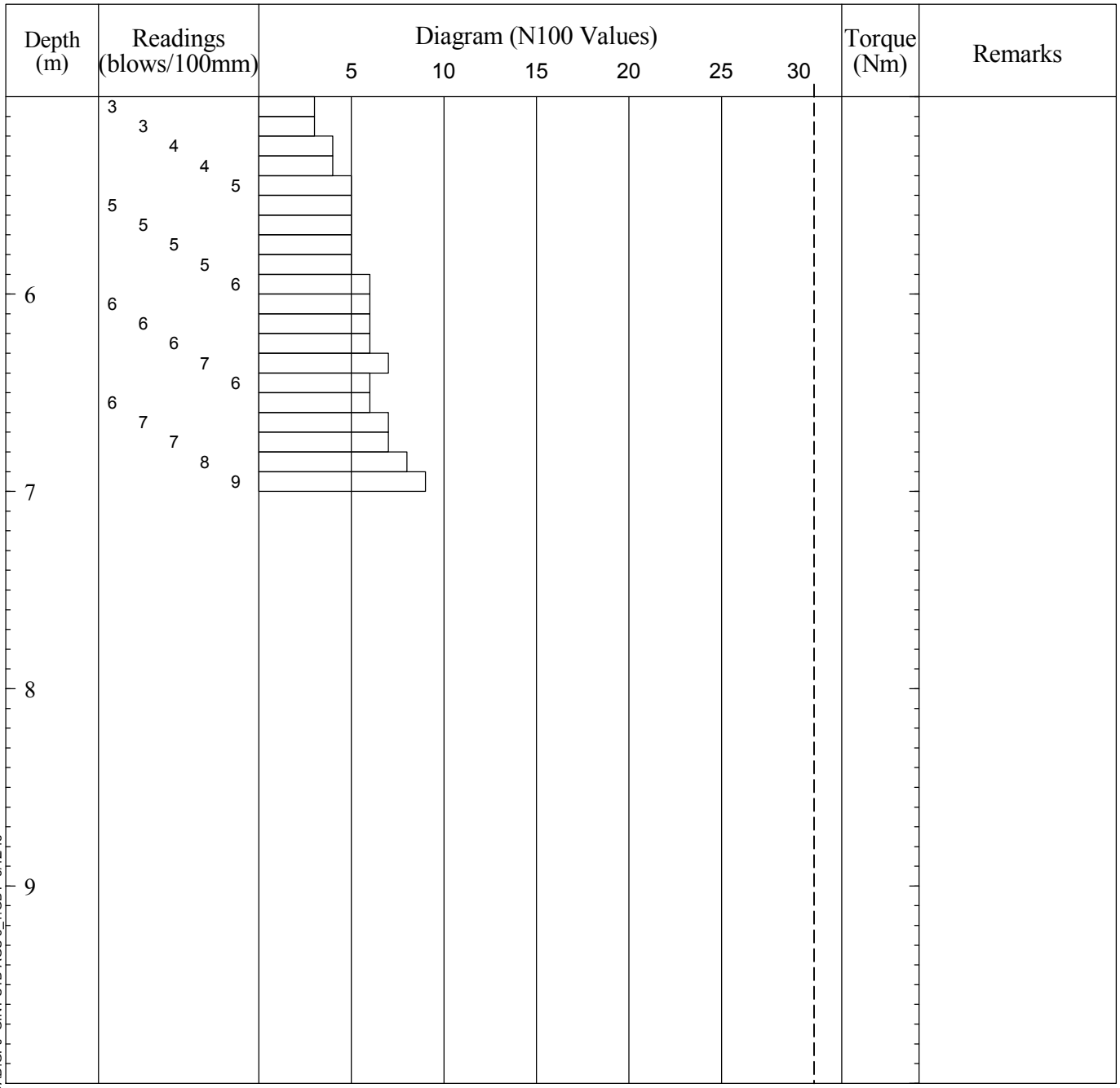
ROBSON LIDDLE DP 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# Robson Liddle Geotechnical

NPS Property Consultants

## DYNAMIC PROBE LOG

| Project: | | | | PROBE No |
|---|---|---|---|---|
| Lytham Road | | | | **DP10** |
| Job No: 12-12-16-1-1163 | Date: 16-10-15 16-10-15 | Ground Level (m) | Co-Ordinates () | |
| Client: Manchester City Council | | | | Sheet 2 of 2 |




| | |
|---|---|
| Hammer Wt (kg) | |
| Hammer Drop (mm) | |
| Cone Dia (mm) | |
| Cone Type | |
| Damper | |

GENERAL REMARKS

| All dimensions in metres Scale 1:31.25 | Contractor: Spektral | Method/ Plant Used: | Logged By: |
|---|---|---|---|

ROBSON LIDDLE DP 12-12-16-1-1163 LYTHAM ROAD.GPJ GINT STD AGS 3_1.GDT 3/12/15

# SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

**Testconsult Limited**
**Ruby House**
**40A Hardwick Grange**
**Warrington**
**Cheshire**
**WA1 4RF**

| | |
|---|---|
| SPT Hammer Ref: | SPK002 |
| Test Date: | 09/07/2014 |
| Report Date: | 16/07/2014 |
| File Name: | SPK002Banalysed.spt |
| Test Operator: | TS |

UKAS TESTING 0955

## Instrumented Rod Data

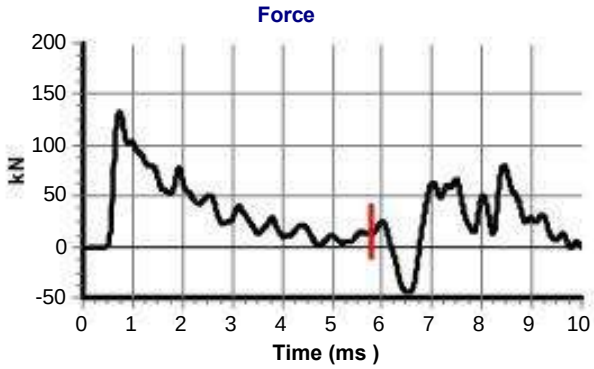
| | |
|---|---|
| Diameter $d_r$ (mm): | 54 |
| Wall Thickness $t_r$ (mm): | 6.6 |
| Assumed Modulus $E_a$ (GPa): | 208 |
| Accelerometer No.1: | 5632 |
| Accelerometer No.2: | 5719 |

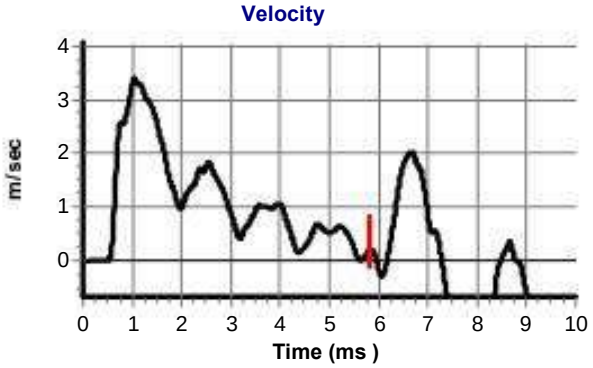
## SPT Hammer Information

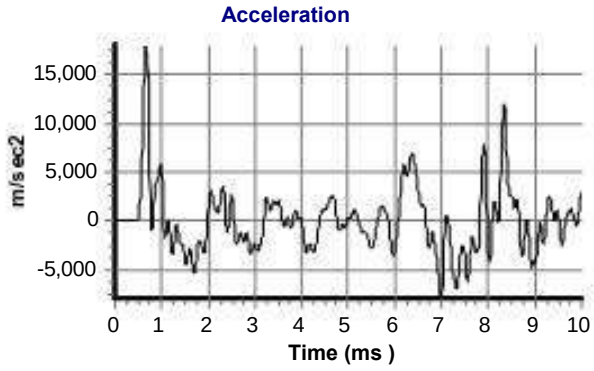
| | |
|---|---|
| Hammer Mass m (kg): | 63.5 |
| Falling Height h (mm): | 760 |
| SPT String Length L (m): | 14.0 |

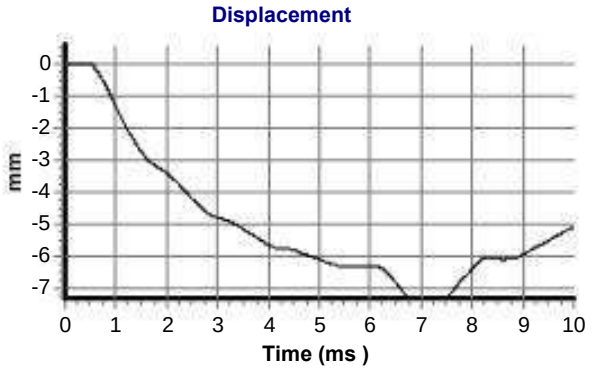
## Comments / Location

Client: Spektral Ltd
Location: Tesconsult Laboratory
Type: Competitor 150




## Calculations

| | |
|---|---|
| Area of Rod A (mm2): | 983 |
| Theoretical Energy $E_{theor}$ (J): | 473 |
| Measured Energy $E_{meas}$ (J): | 360 |

**Energy Ratio $E_r$ (%):** **76**

Signed: Huw Williams
Title: Director

TESTCONSULT LIMITED TESTING SERVICE

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# Appendix D

# Infiltration Test Results

# *IN SITU TESTING - Soakaway Test*

Robson Liddle

Project: **Lytham Road, Manchester**
Project No: **12-12-16-1-1163**
Client: **Manchester City Council**

Test Location : **TP1**
Test No : **1**
Date : **14/10/15**

| ELAPSED TIME (minutes) | DEPTH to water below ground level (m) | HEAD (m) | HEAD (% effective depth) |
|---|---|---|---|
| 0 | 0.99 | 0.71 | 100.0 |
| 1 | 0.99 | 0.71 | 100.0 |
| 2 | 0.99 | 0.71 | 100.0 |
| 3 | 0.99 | 0.71 | 100.0 |
| 4 | 0.99 | 0.71 | 100.0 |
| 5 | 0.99 | 0.71 | 100.0 |
| 6 | 0.99 | 0.71 | 100.0 |
| 7 | 0.99 | 0.71 | 100.0 |
| 8 | 0.99 | 0.71 | 100.0 |
| 9 | 0.99 | 0.71 | 100.0 |
| 10 | 0.99 | 0.71 | 100.0 |
| 20 | 0.99 | 0.71 | 100.0 |
| 50 | 0.99 | 0.71 | 100.0 |
| 110 | 0.99 | 0.71 | 100.0 |
| 170 | 0.99 | 0.71 | 100.0 |
| | | | |
| | | | |
| | | | |
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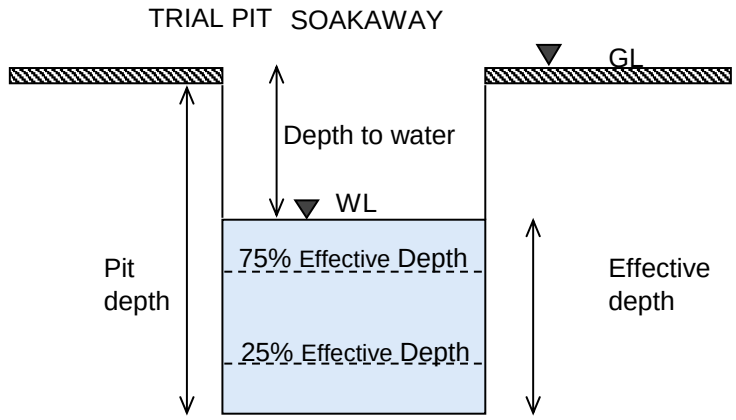
| | | | |
| | | | |



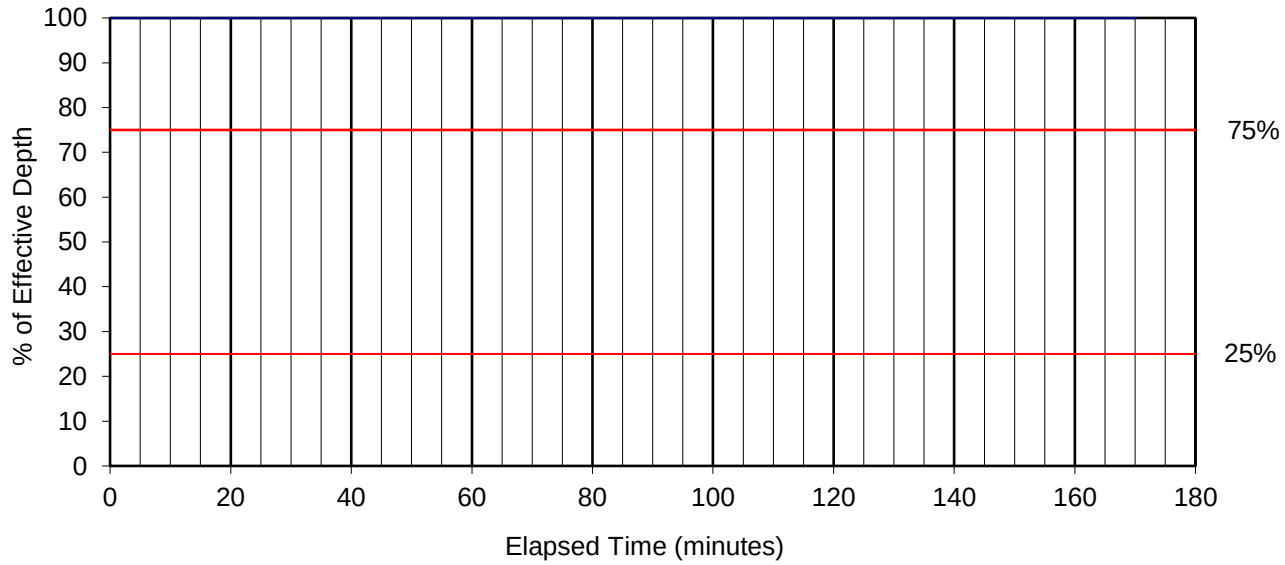

| | | | |
|---|---|---|---|
| Trial Pit Length | = | 3.00 | m |
| Trial Pit Width | = | 0.60 | m |
| Trial Pit Depth | = | 1.70 | m |
| Effective depth (Head of Water) | = | 0.71 | m |

| | % of effective depth 75% | 25% | |
|---|---|---|---|
| Depth | 1.17 | 1.52 | m bgl |
| Head | 0.53 | 0.18 | m |
| Time | - | - | minutes |

| | | | |
|---|---|---|---|
| $V_{p75-25}$ | = | 0.64 | $m^3$ |
| $a_{p50}$ | = | 4.36 | $m^2$ |
| $t_{p75-25}$ | = | 0 | min |

| | | | |
|---|---|---|---|
| $t_{p75}$ | = | - | minutes |
| $t_{p25}$ | = | - | minutes |

**Soil Infiltration rate, *f*** **=** **-** **m/sec**
**0 mm/hr**




Remarks:
Test failed

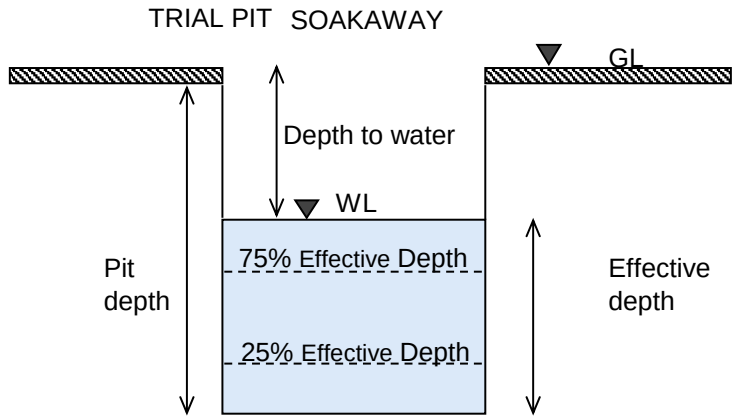
# *IN SITU TESTING - Soakaway Test*

**Robson Liddle**

Project: **Lytham Road, Manchester**
Project No: **12-12-16-1-1163**
Client: **Manchester City Council**

Test Location : **TP7**
Test No : **1**
Date : **14/10/15**

| ELAPSED TIME (minutes) | DEPTH to water below ground level (m) | HEAD (m) | HEAD (% effective depth) |
|---|---|---|---|
| 0 | 1.12 | 0.58 | 100.0 |
| 1 | 1.13 | 0.57 | 98.3 |
| 2 | 1.13 | 0.57 | 98.3 |
| 3 | 1.13 | 0.57 | 98.3 |
| 4 | 1.13 | 0.57 | 98.3 |
| 5 | 1.13 | 0.57 | 98.3 |
| 6 | 1.13 | 0.57 | 98.3 |
| 7 | 1.13 | 0.57 | 98.3 |
| 8 | 1.13 | 0.57 | 98.3 |
| 9 | 1.13 | 0.57 | 98.3 |
| 10 | 1.13 | 0.57 | 98.3 |
| 11 | 1.13 | 0.57 | 98.3 |
| 12 | 1.13 | 0.57 | 98.3 |
| 13 | 1.13 | 0.57 | 98.3 |
| 59 | 1.13 | 0.57 | 98.3 |
| 120 | 1.13 | 0.57 | 98.3 |
| 180 | 1.13 | 0.57 | 98.3 |
| 240 | 1.13 | 0.57 | 98.3 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |



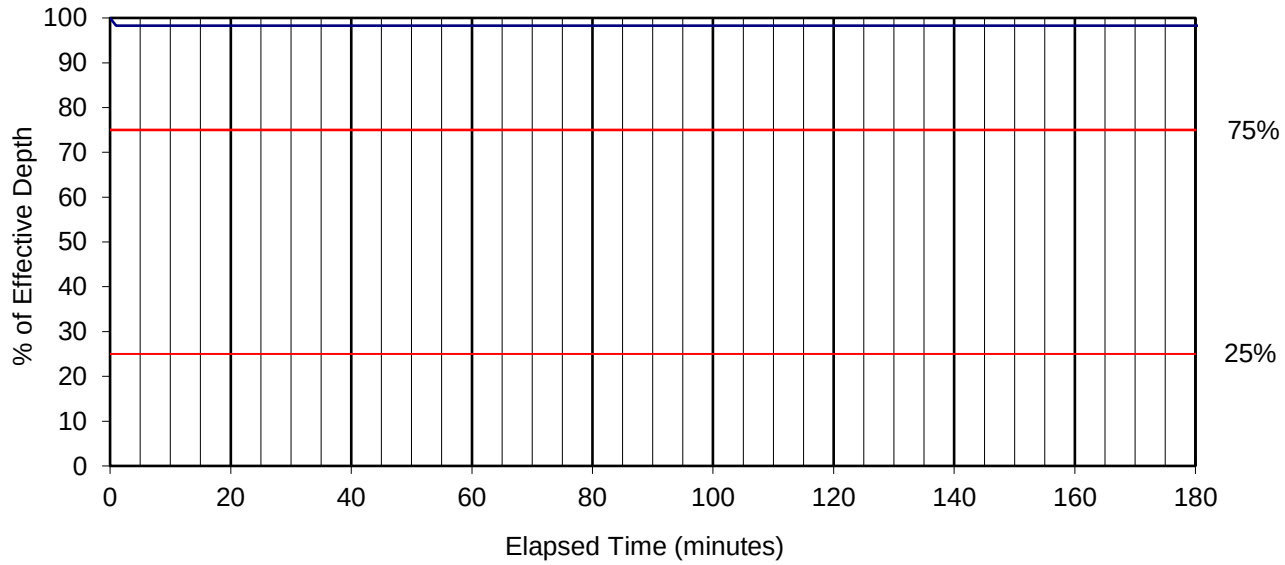

| | | | |
|---|---|---|---|
| Trial Pit Length | = | 3.60 | m |
| Trial Pit Width | = | 0.65 | m |
| Trial Pit Depth | = | 1.70 | m |
| Effective depth (Head of Water) | = | 0.58 | m |

| | % of effective depth 75% | 25% | |
|---|---|---|---|
| Depth | 1.27 | 1.56 | m bgl |
| Head | 0.44 | 0.15 | m |
| Time | - | - | minutes |

| | | | |
|---|---|---|---|
| $V_{p75-25}$ | = | 0.68 | $m^3$ |
| $a_{p50}$ | = | 4.81 | $m^2$ |
| $t_{p75-25}$ | = | 0 | min |

| | | | |
|---|---|---|---|
| $t_{p75}$ | = | - | minutes |
| $t_{p25}$ | = | - | minutes |

**Soil Infiltration rate, *f*** **=** **-** **m/sec**
**0 mm/hr**




Remarks:
Test failed

# Appendix E

# Geotechnical Test Certificates

# SUMMARY OF LABORATORY SOIL TEST RESULTS

| BH / TP / WS Number | Sample Type | Depth From (m) | Depth To (m) | Moisture Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Shear Strength ($kN/m^2$) | Liquid Limit (%) | Plastic Limit (%) | Plasticity Index (%) | Passing 0.425mm (%) | Soil Classification | UKAS accredited test (Y/N) | Description / Test Method<br>Samples described in accordance with BS EN ISO 14688-2 2004 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TP1 | D | 1.10 | 1.10 | 17 | - | - | - | 36 | 16 | 20 | 93 | CI | Y | Brownish grey slightly sandy slightly gravelly sily CLAY. (BS1377Pt2:3.2,4.4,5) |
| TP2 | D | 1.20 | 1.20 | 15 | - | - | - | 35 | 15 | 20 | 94 | CL / CI | Y | Brownish grey slightly sandy slightly gravelly sily CLAY. (BS1377Pt2:3.2,4.4,5) |
| TP2 | D | 2.10 | 2.10 | 14 | - | - | - | 34 | 15 | 19 | 89 | CL | Y | Brownish grey slightly sandy slightly gravelly sily CLAY. (BS1377Pt2:3.2,4.4,5) |
| TP3 | D | 2.15 | 2.15 | 11 | - | - | - | - | - | - | - | NP | Y | Brown silty slightly gravelly fine to medium grained SAND with occasional pocket of clay. (BS1377Pt2:3.2,4.4,5) |
| TP4 | D | 1.50 | 1.50 | 15 | - | - | - | 37 | 17 | 20 | 95 | CI | Y | Brownish grey slightly sandy slightly gravelly sily CLAY. (BS1377Pt2:3.2,4.4,5) |
| TP6 | D | 0.70 | 0.70 | 19 | - | - | - | 40 | 18 | 22 | 97 | CI | Y | Brownish grey slightly sandy slightly gravelly sily CLAY. (BS1377Pt2:3.2,4.4,5) |
| TP8 | D | 1.10 | 1.10 | 18 | - | - | - | 36 | 16 | 20 | 94 | CI | Y | Brownish grey slightly sandy slightly gravelly sily CLAY. (BS1377Pt2:3.2,4.4,5) |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

SITE: LYTHAM ROAD, FALLOWFIELDS (CCG-C-15-8540)

CLIENT: ROBSON LIDDLE

DATE: 19.11.15

SHEET: 1 of 1

UKAS TESTING 4514

Key:- BD = Bulk Disturbed; SD = Small Disturbed; U100 = Undisturbed 100mm; WS = Window Sample
CL = Low Plasticity; CI = Intermediate; CH = High; CV = Very high; CE = Extremely high; NP = Non-plastic
(* Denotes Hand Shear Vane test result)
Sample description not accredited by UKAS

# SUMMARY OF LABORATORY SOIL TEST RESULTS

| BH / TP / WS Number | Sample Type | Depth From (m) | Depth To (m) | Moisture Content (%) | Bulk Density ($Mg/m^3$) | Dry Density ($Mg/m^3$) | Shear Strength ($kN/m^2$) | Liquid Limit (%) | Plastic Limit (%) | Plasticity Index (%) | Passing 0.425mm (%) | Soil Classification | UKAS accredited test (Y/N) | Description / Test Method<br>Samples described in accordance with BS EN ISO 14688-2 2004 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WS1 | D | 0.80 | 0.80 | 30 | - | - | - | 50 | 20 | 30 | 97 | CI / CH | Y | Light brown slightly sandy slightly gravelly silty CLAY. (BS1377Pt2:3.2,4.4,5) |
| WS1 | D | 1.60 | 1.60 | 15 | - | - | - | 31 | 15 | 16 | 91 | CL | Y | Brownish grey slightly sandy slightly gravelly silty CLAY. (BS1377Pt2:3.2,4.4,5) |
| WS4 | D | 0.90 | 0.90 | 19 | - | - | - | 33 | 16 | 17 | 93 | CL | Y | Brownish grey slightly sandy slightly gravelly silty CLAY. (BS1377Pt2:3.2,4.4,5) |
| WS4 | D | 1.50 | 1.50 | 16 | - | - | - | 30 | 14 | 16 | 90 | CL | Y | Brownish grey slightly sandy slightly gravelly silty CLAY. (BS1377Pt2:3.2,4.4,5) |
| WS5 | D | 1.10 | 1.10 | 18 | - | - | - | 31 | 15 | 16 | 93 | CL | Y | Brownish grey slightly sandy slightly gravelly silty CLAY. (BS1377Pt2:3.2,4.4,5) |
| WS9 | D | 1.00 | 1.00 | 19 | - | - | - | 35 | 18 | 17 | 94 | CL / CI | Y | Brownish grey slightly sandy slightly gravelly silty CLAY. (BS1377Pt2:3.2,4.4,5) |
| WS9 | D | 2.00 | 2.00 | 15 | - | - | - | 34 | 16 | 18 | 95 | CL | Y | Brownish grey slightly sandy slightly gravelly silty CLAY. (BS1377Pt2:3.2,4.4,5) |
| WS10 | D | 0.60 | 0.60 | 21 | - | - | - | 31 | 16 | 15 | 97 | CL | Y | Brown slightly sandy slightly gravelly silty CLAY with frequent rootlets. (BS1377Pt2:3.2,4.4,5) |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

SITE: LYTHAM ROAD, FALLOWFIELDS (CCG-C-15-8540) DATE: 19.11.15

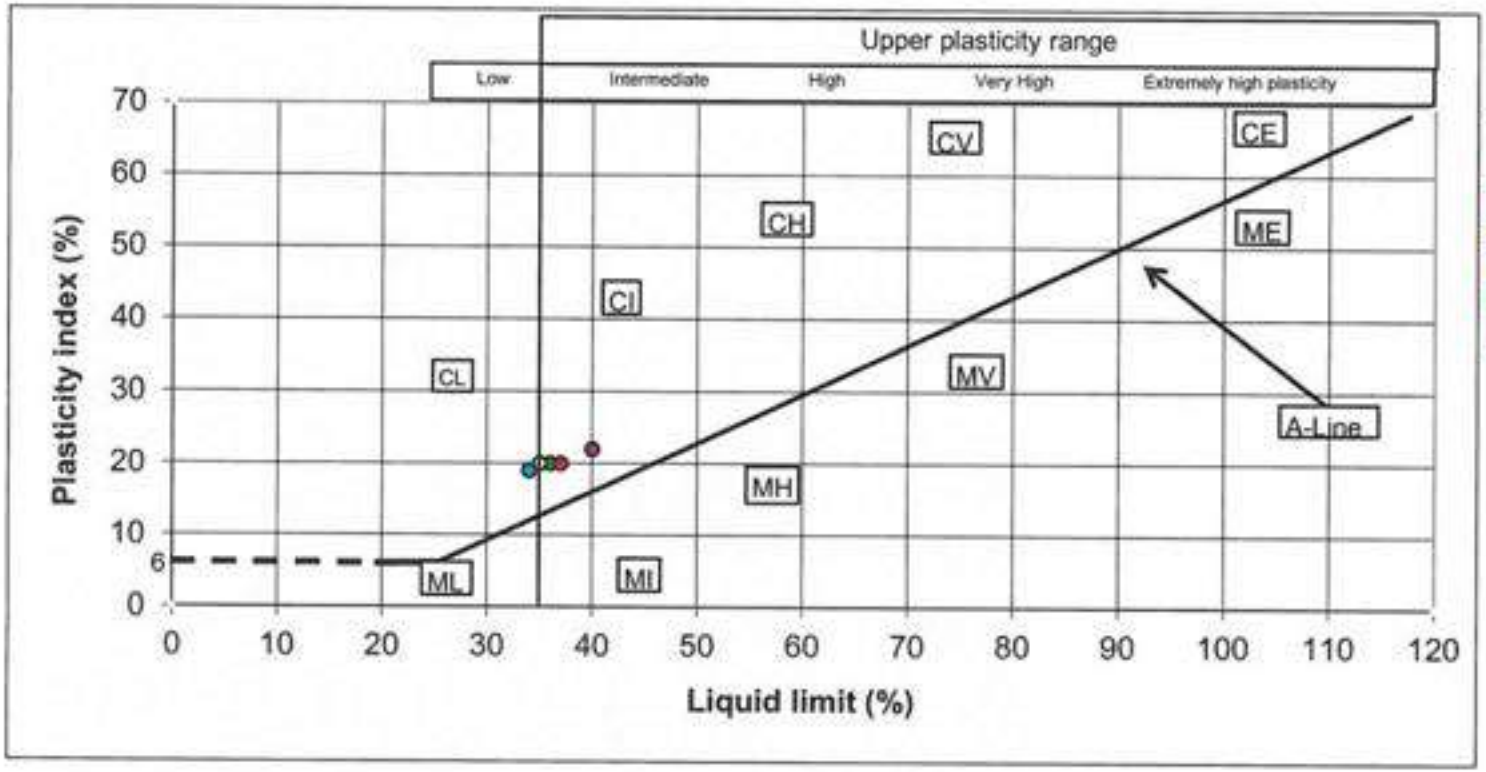
CLIENT: ROBSON LIDDLE SHEET: 1 of 1

UKAS TESTING 4514

Key:- BD = Bulk Disturbed; SD = Small Disturbed; U100 = Undisturbed 100mm; WS = Window Sample
CL = Low Plasticity; CI = Intermediate; CH = High; CV = Very high; CE = Extremely high; NP = Non-plastic
(* Denotes Hand Shear Vane test result)
Sample description not accredited by UKAS

**ATTERBERG TEST RESULT SHEET**
BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



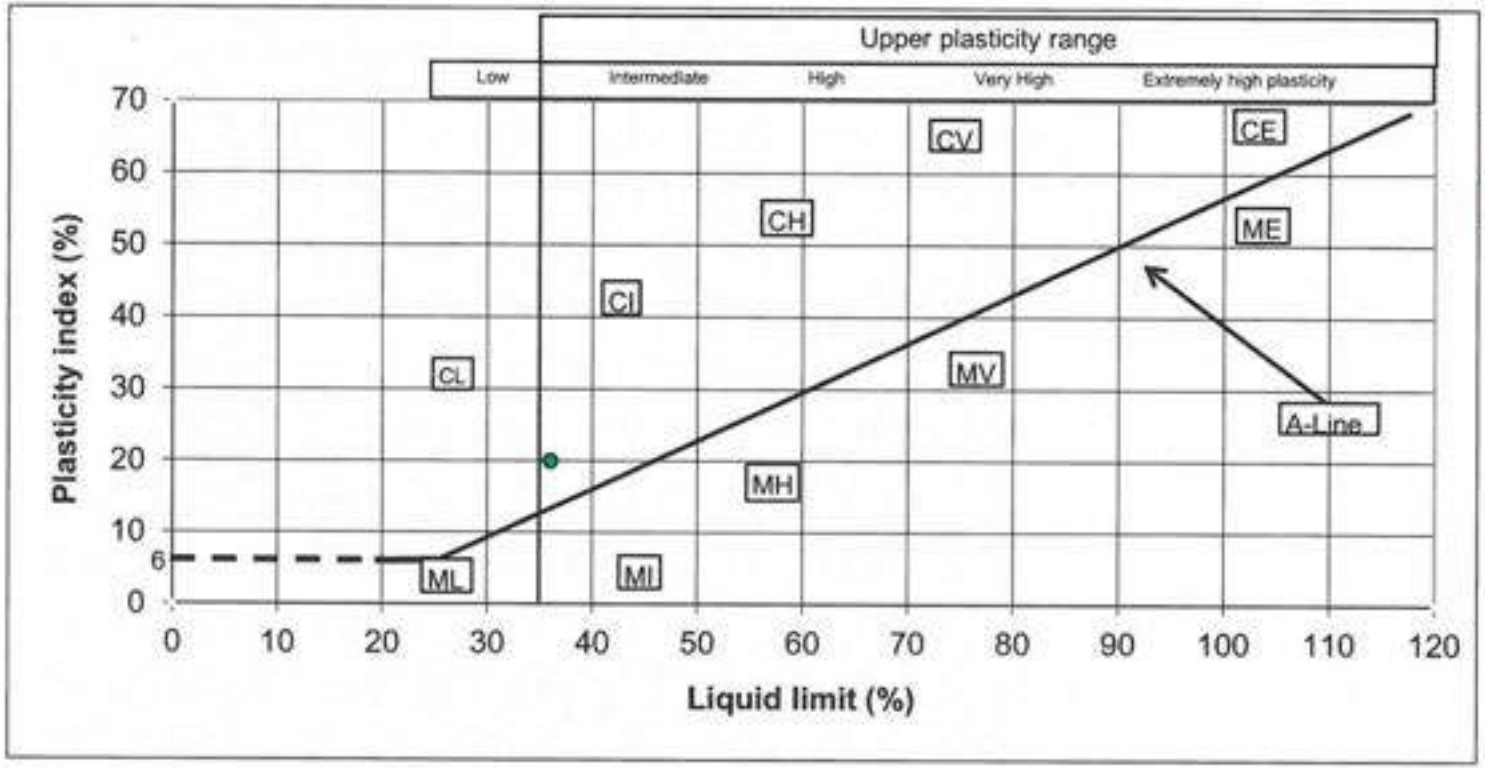

| BH | Sample Depth | Liquid limit | Plasticity index |
|---|---|---|---|
| TP1 | 1.10 | 38.0 | 20.0 |
| TP2 | 1.20 | 35.0 | 20.0 |
| TP2 | 2.10 | 34.0 | 19.0 |
| TP4 | 1.50 | 37.0 | 20.0 |
| TP6 | 0.70 | 40.0 | 22.0 |

UKAS TESTING
4514

| CLIENT: ROBSON LIDDLE | SITE: LYTHAM RD, FALLOWFIELDS (CCG-C-15-8540) |
|---|---|

**ATTERBERG TEST RESULT SHEET**
BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



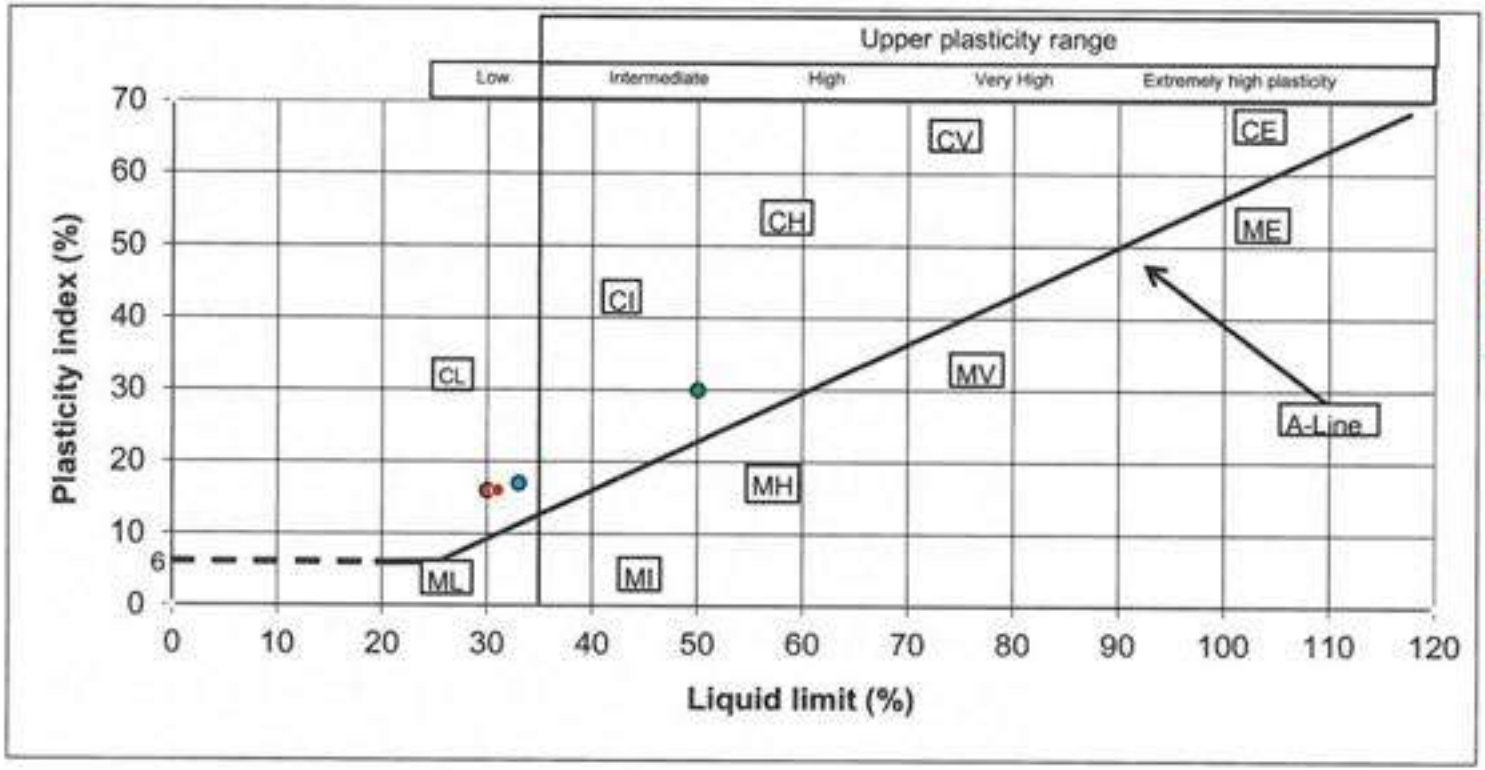

| BH | Sample Depth | Liquid limit | Plasticity index |
|---|---|---|---|
| TP3 | 1.00 | 32.0 | 20.0 |

UKAS TESTING
4514

| CLIENT: ROBSON LIDDLE | SITE: LYTHAM RD, FALLOWFIELDS (CCG-C-15-8540) |
|---|---|

**ATTERBERG TEST RESULT SHEET**
BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



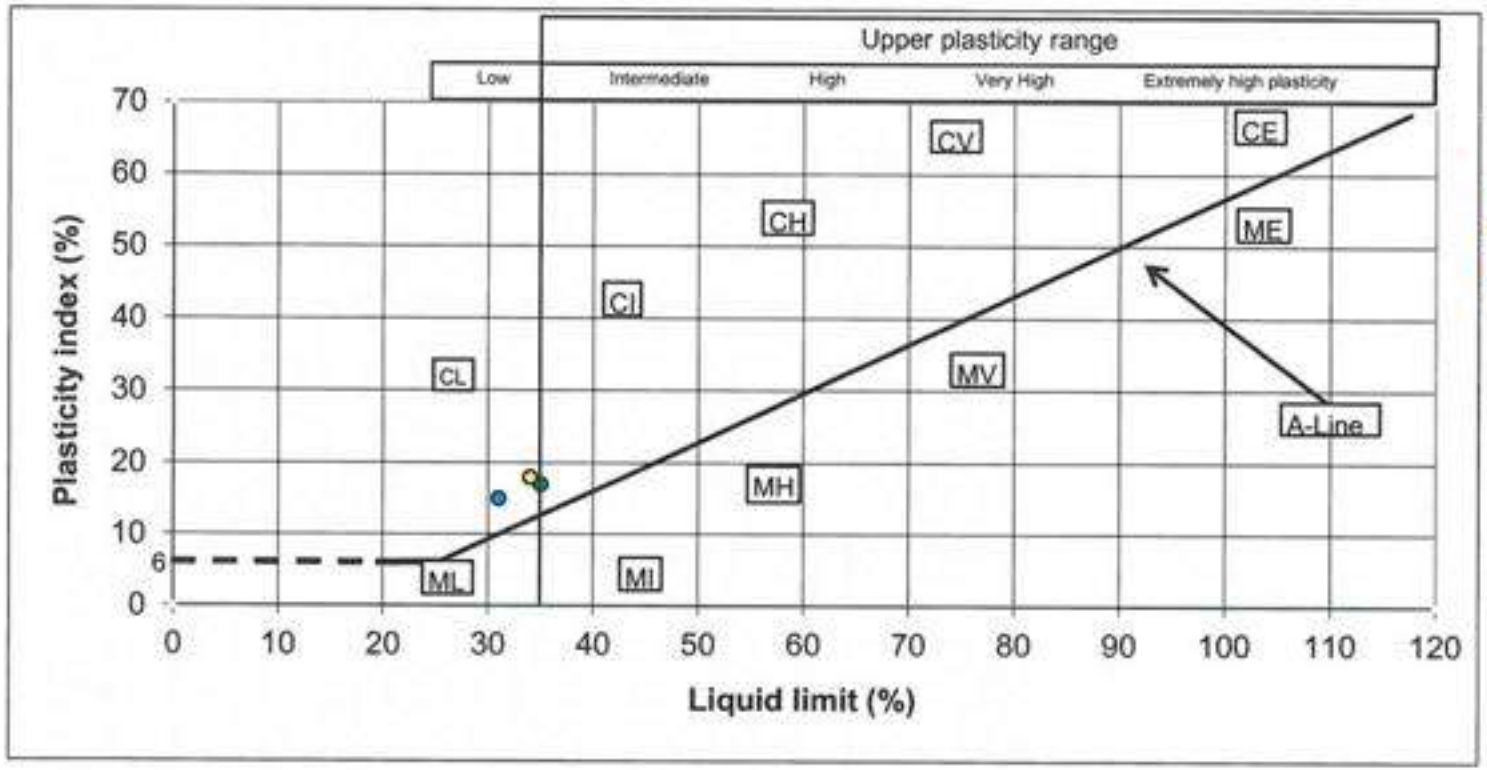

| BH | Sample Depth | Liquid limit | Plasticity index |
|---|---|---|---|
| WS1 | 0.80 | 30.0 | 14.0 |
| WS1 | 1.60 | 31.0 | 16.0 |
| WS4 | 0.90 | 33.0 | 17.0 |
| WS4 | 1.50 | 30.0 | 16.0 |
| WS5 | 1.10 | 31.0 | 16.0 |

UKAS TESTING
4514

| CLIENT: ROBSON LIDDLE | SITE: LYTHAM RD, FALLOWFIELDS (CCG-C-15-8540) |
|---|---|

**ATTERBERG TEST RESULT SHEET**
BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.




| BH | Sample Depth | Liquid limit | Plasticity index |
|---|---|---|---|
| WS9 | 0.00 | 35.0 | 17.0 |
| WS9 | 2.00 | 34.0 | 18.0 |
| WS10 | 0.80 | 31.0 | 15.0 |

UKAS TESTING
4514

CLIENT: ROBSON LIDDLE
SITE: LYTHAM RD, FALLOWFIELDS (CCG-C-15-8540)

# Appendix F

# Chemical Test Certificates

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# Analytical Report Number : 15-80970

| | | | |
|---|---|---|---|
| **Project / Site name:** | Lytham Road Manchester | **Samples received on:** | 21/10/2015 |
| **Your job number:** | 12-12-16-1-1163 | **Samples instructed on:** | 21/10/2015 |
| **Your order number:** | | **Analysis completed by:** | 30/10/2015 |
| **Report Issue Number:** | 1 | **Report issued on:** | 30/10/2015 |
| **Samples Analysed:** | 24 soil samples | | |

**Signed:**

Rexona Rahman
Reporting Manager
**For & on behalf of i2 Analytical Ltd.**

**Signed:**

Dr Irma Doyle
Assistant Quality Manager
**For & on behalf of i2 Analytical Ltd.**

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

| | |
|---|---|
| soils | - 4 weeks from reporting |
| leachates | - 2 weeks from reporting |
| waters | - 2 weeks from reporting |
| asbestos | - 6 months from reporting |

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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 15-80970**

**Project / Site name: Lytham Road Manchester**

| **Lab Sample Number** | | | | 497933 | 497934 | 497935 | 497936 | 497937 | 497938 |
|---|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP1 | TP2 | TP3 | TP3 | TP4 | TP5 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.30 | 0.30 | 0.10 | 0.70 | 0.15 | 1.10 |
| **Date Sampled** | | | | 14/10/2015 | 14/10/2015 | 14/10/2015 | 14/10/2015 | 14/10/2015 | 14/10/2015 |
| **Time Taken** | | | | 0941 | 1033 | 1123 | 1128 | 1211 | 1321 |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | | |
| Stone Content | % | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Moisture Content | % | N/A | NONE | 20 | 7.2 | 21 | 17 | 22 | 43 |
| Total mass of sample received | kg | 0.001 | NONE | 0.50 | 0.81 | 0.48 | 1.2 | 0.42 | 1.2 |
| Asbestos in Soil | Type | N/A | ISO 17025 | - | Not-detected | - | - | - | Not-detected |
| **General Inorganics** | | | | | | | | | |
| pH | pH Units | N/A | MCERTS | 5.3 | 6.7 | 6.0 | 5.9 | 5.4 | 7.8 |
| Total Sulphate as $SO_4$ | mg/kg | 50 | MCERTS | - | - | - | - | - | - |
| Water Soluble Sulphate (Soil Equivalent) | g/kg | 0.0025 | MCERTS | - | - | - | - | - | - |
| Water Soluble SO4 (BRE SD 2:1 Leach Equivalent) | g/l | 0.00125 | MCERTS | - | - | - | - | - | - |
| Water Soluble Chloride (2:1) | mg/kg | 1 | MCERTS | - | - | - | - | - | - |
| Total Sulphur | mg/kg | 50 | NONE | - | - | - | - | - | - |
| Ammonium as $NH_4$ | mg/kg | 0.5 | MCERTS | - | - | - | - | - | - |
| Total Organic Carbon (TOC) | % | 0.1 | MCERTS | 2.0 | < 0.1 | 2.3 | 0.4 | 3.0 | 1.8 |
| Water Soluble Nitrate (2:1) as N | mg/kg | 2 | NONE | - | - | - | - | - | - |
| **Total Phenols** | | | | | | | | | |
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| **Speciated PAHs** | | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | 2.7 | < 0.05 | 3.1 | < 0.05 | 1.8 | 0.52 |
| Acenaphthylene | mg/kg | 0.1 | MCERTS | 1.1 | < 0.10 | 1.2 | < 0.10 | 0.75 | < 0.10 |
| Acenaphthene | mg/kg | 0.1 | MCERTS | 5.3 | < 0.10 | 7.9 | < 0.10 | 3.6 | 1.1 |
| Fluorene | mg/kg | 0.1 | MCERTS | 4.1 | < 0.10 | 5.6 | < 0.10 | 2.7 | 1.1 |
| Phenanthrene | mg/kg | 0.1 | MCERTS | 32 | 1.2 | 55 | 1.1 | 31 | 8.7 |
| Anthracene | mg/kg | 0.1 | MCERTS | 6.6 | 0.24 | 11 | 0.20 | 6.7 | 2.1 |
| Fluoranthene | mg/kg | 0.1 | MCERTS | 39 | 1.8 | 72 | 1.3 | 44 | 8.5 |
| Pyrene | mg/kg | 0.1 | MCERTS | 35 | 1.8 | 68 | 1.2 | 40 | 8.9 |
| Benzo(a)anthracene | mg/kg | 0.1 | MCERTS | 22 | 0.87 | 43 | 0.53 | 23 | 5.9 |
| Chrysene | mg/kg | 0.05 | MCERTS | 19 | 0.84 | 33 | 0.61 | 21 | 5.2 |
| Benzo(b)fluoranthene | mg/kg | 0.1 | MCERTS | 26 | 1.1 | 32 | 0.46 | 22 | 4.2 |
| Benzo(k)fluoranthene | mg/kg | 0.1 | MCERTS | 8.3 | 0.50 | 29 | 0.36 | 13 | 3.5 |
| Benzo(a)pyrene | mg/kg | 0.1 | MCERTS | 19 | 0.81 | 36 | 0.50 | 20 | 4.5 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.1 | MCERTS | 8.2 | 0.41 | 15 | 0.22 | 8.5 | 1.8 |
| Dibenz(a,h)anthracene | mg/kg | 0.1 | MCERTS | 2.0 | < 0.10 | 3.9 | < 0.10 | 2.3 | 0.55 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | 8.2 | 0.46 | 15 | 0.24 | 8.9 | 1.9 |
| **Total PAH** | | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 1.6 | MCERTS | 239 | 10.0 | 432 | 6.60 | 249 | 58.5 |
| **Heavy Metals / Metalloids** | | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 17 | 20 | 18 | 5.6 | 31 | 120 |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | 0.6 | 0.3 | 0.5 | 0.4 | 0.3 | 0.8 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Chromium (hexavalent) | mg/kg | 4 | MCERTS | < 4.0 | < 4.0 | < 4.0 | < 4.0 | < 4.0 | < 4.0 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 19 | 17 | 20 | 23 | 21 | 26 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 95 | 180 | 67 | 15 | 200 | 360 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 260 | 40 | 150 | 14 | 320 | 740 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | 0.4 | < 0.3 | 0.6 | 0.7 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 22 | 20 | 22 | 18 | 29 | 92 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 97 | 220 | 93 | 36 | 130 | 370 |



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 15-80970**

**Project / Site name: Lytham Road Manchester**

| Lab Sample Number | | | | 497933 | 497934 | 497935 | 497936 | 497937 | 497938 |
|---|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP1 | TP2 | TP3 | TP3 | TP4 | TP5 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.30 | 0.30 | 0.10 | 0.70 | 0.15 | 1.10 |
| **Date Sampled** | | | | 14/10/2015 | 14/10/2015 | 14/10/2015 | 14/10/2015 | 14/10/2015 | 14/10/2015 |
| **Time Taken** | | | | 0941 | 1033 | 1123 | 1128 | 1211 | 1321 |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | | |
| **Monoaromatics** | | | | | | | | | |
| Benzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| p & m-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| **Petroleum Hydrocarbons** | | | | | | | | | |
| TPH-CWG - Aliphatic >EC5 - EC6 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC6 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH-CWG - Aliphatic >EC12 - EC16 | mg/kg | 2 | MCERTS | 4.8 | < 2.0 | 4.1 | < 2.0 | < 2.0 | < 2.0 |
| TPH-CWG - Aliphatic >EC16 - EC21 | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | 9.9 | < 8.0 | 9.7 | < 8.0 |
| TPH-CWG - Aliphatic >EC21 - EC35 | mg/kg | 8 | MCERTS | 16 | < 8.0 | 18 | < 8.0 | 12 | 11 |
| TPH-CWG - Aliphatic > EC35 - EC44 | mg/kg | 8.4 | NONE | < 8.4 | < 8.4 | < 8.4 | < 8.4 | < 8.4 | < 8.4 |
| **TPH-CWG - Aliphatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | 21 | < 10 | 32 | < 10 | 22 | 11 |
| **TPH-CWG - Aliphatic (EC5 - EC44)** | mg/kg | 10 | NONE | 21 | < 10 | 32 | < 10 | 22 | 11 |
| TPH-CWG - Aromatic >EC5 - EC7 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aromatic >EC7 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aromatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aromatic >EC10 - EC12 | mg/kg | 1 | MCERTS | 3.4 | < 1.0 | 5.2 | < 1.0 | 2.7 | < 1.0 |
| TPH-CWG - Aromatic >EC12 - EC16 | mg/kg | 2 | MCERTS | 54 | < 2.0 | 100 | 2.9 | 61 | 17 |
| TPH-CWG - Aromatic >EC16 - EC21 | mg/kg | 10 | MCERTS | 260 | < 10 | 400 | 15 | 400 | 110 |
| TPH-CWG - Aromatic >EC21 - EC35 | mg/kg | 10 | MCERTS | 350 | < 10 | 780 | < 10 | 570 | 240 |
| TPH-CWG - Aromatic > EC35 - EC44 | mg/kg | 8.4 | NONE | < 8.4 | < 8.4 | 25 | < 8.4 | 25 | 14 |
| **TPH-CWG - Aromatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | 670 | < 10 | 1300 | 18 | 1000 | 360 |
| **TPH-CWG - Aromatic (EC5 - EC44)** | mg/kg | 10 | NONE | 670 | < 10 | 1300 | 18 | 1100 | 370 |



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 15-80970**

**Project / Site name: Lytham Road Manchester**

| Lab Sample Number | | | | 497939 | 497940 | 497941 | 497942 | 497943 | 497944 |
|---|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP5A | TP5A | TP8 | WS1 | WS1 | WS2 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.20 | 1.10 | 0.10 | 0.40 | 0.70 | 0.15 |
| **Date Sampled** | | | | 14/10/2015 | 14/10/2015 | 14/10/2015 | 15/10/2015 | 15/10/2015 | 15/10/2015 |
| **Time Taken** | | | | 1336 | 1344 | 1242 | 1134 | 1136 | 1305 |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | | |
| Stone Content | % | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Moisture Content | % | N/A | NONE | 22 | 18 | 24 | 12 | 20 | 16 |
| Total mass of sample received | kg | 0.001 | NONE | 0.91 | 0.54 | 0.45 | 0.90 | 0.51 | 0.32 |
| Asbestos in Soil | Type | N/A | ISO 17025 | - | - | - | Not-detected | - | - |
| **General Inorganics** | | | | | | | | | |
| pH | pH Units | N/A | MCERTS | 5.9 | 6.9 | 4.3 | 6.7 | 5.4 | 7.4 |
| Total Sulphate as $SO_4$ | mg/kg | 50 | MCERTS | - | - | - | - | - | 1300 |
| Water Soluble Sulphate (Soil Equivalent) | g/kg | 0.0025 | MCERTS | - | - | - | - | - | 0.12 |
| Water Soluble SO4 (BRE SD 2:1 Leach Equivalent) | g/l | 0.00125 | MCERTS | - | - | - | - | - | 0.060 |
| Water Soluble Chloride (2:1) | mg/kg | 1 | MCERTS | - | - | - | - | - | 15 |
| Total Sulphur | mg/kg | 50 | NONE | - | - | - | - | - | 960 |
| Ammonium as $NH_4$ | mg/kg | 0.5 | MCERTS | - | - | - | - | - | < 0.5 |
| Total Organic Carbon (TOC) | % | 0.1 | MCERTS | 2.1 | < 0.1 | 2.2 | 0.7 | 1.6 | - |
| Water Soluble Nitrate (2:1) as N | mg/kg | 2 | NONE | - | - | - | - | - | < 2.0 |
| **Total Phenols** | | | | | | | | | |
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | 1.4 | < 1.0 | < 1.0 | - |
| **Speciated PAHs** | | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | 3.1 | < 0.05 | 0.83 | < 0.05 | < 0.05 | - |
| Acenaphthylene | mg/kg | 0.1 | MCERTS | 2.3 | < 0.10 | 0.76 | < 0.10 | < 0.10 | - |
| Acenaphthene | mg/kg | 0.1 | MCERTS | 5.9 | < 0.10 | 2.7 | 0.34 | < 0.10 | - |
| Fluorene | mg/kg | 0.1 | MCERTS | 5.0 | < 0.10 | 2.2 | < 0.10 | < 0.10 | - |
| Phenanthrene | mg/kg | 0.1 | MCERTS | 48 | < 0.10 | 21 | 3.0 | 0.86 | - |
| Anthracene | mg/kg | 0.1 | MCERTS | 11 | < 0.10 | 5.2 | 0.84 | 0.19 | - |
| Fluoranthene | mg/kg | 0.1 | MCERTS | 62 | < 0.10 | 28 | 6.0 | 1.0 | - |
| Pyrene | mg/kg | 0.1 | MCERTS | 57 | < 0.10 | 27 | 5.2 | 1.1 | - |
| Benzo(a)anthracene | mg/kg | 0.1 | MCERTS | 35 | < 0.10 | 16 | 4.6 | 0.61 | - |
| Chrysene | mg/kg | 0.05 | MCERTS | 31 | < 0.05 | 13 | 3.0 | 0.49 | - |
| Benzo(b)fluoranthene | mg/kg | 0.1 | MCERTS | 38 | < 0.10 | 13 | 4.5 | 0.46 | - |
| Benzo(k)fluoranthene | mg/kg | 0.1 | MCERTS | 17 | < 0.10 | 10 | 2.2 | 0.36 | - |
| Benzo(a)pyrene | mg/kg | 0.1 | MCERTS | 32 | < 0.10 | 14 | 3.2 | 0.48 | - |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.1 | MCERTS | 14 | < 0.10 | 6.2 | 1.4 | < 0.10 | - |
| Dibenz(a,h)anthracene | mg/kg | 0.1 | MCERTS | 3.6 | < 0.10 | 1.5 | 0.40 | < 0.10 | - |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | 14 | < 0.05 | 6.3 | 1.5 | < 0.05 | - |
| **Total PAH** | | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 1.6 | MCERTS | 378 | < 1.60 | 169 | 36.1 | 5.58 | - |
| **Heavy Metals / Metalloids** | | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 75 | 5.4 | 19 | 28 | 2.8 | - |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | 0.6 | 1.4 | 0.7 | < 0.2 | 0.7 | - |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 | - |
| Chromium (hexavalent) | mg/kg | 4 | MCERTS | < 4.0 | < 4.0 | < 4.0 | < 4.0 | < 4.0 | - |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 28 | 28 | 21 | 21 | 20 | - |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 260 | 18 | 72 | 100 | 19 | - |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 730 | 14 | 140 | 49 | 20 | - |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | 1.5 | < 0.3 | < 0.3 | < 0.3 | < 0.3 | - |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 58 | 43 | 17 | 57 | 16 | - |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | - |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 270 | 56 | 51 | 78 | 37 | - |



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 15-80970**

**Project / Site name: Lytham Road Manchester**

| Lab Sample Number | | | | 497939 | 497940 | 497941 | 497942 | 497943 | 497944 |
|---|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | TP5A | TP5A | TP8 | WS1 | WS1 | WS2 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 0.20 | 1.10 | 0.10 | 0.40 | 0.70 | 0.15 |
| Date Sampled | | | | 14/10/2015 | 14/10/2015 | 14/10/2015 | 15/10/2015 | 15/10/2015 | 15/10/2015 |
| Time Taken | | | | 1336 | 1344 | 1242 | 1134 | 1136 | 1305 |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | | |
| **Monoaromatics** | | | | | | | | | |
| Benzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | - |
| Toluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | - |
| Ethylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | - |
| p & m-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | - |
| o-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | - |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | - |

**Petroleum Hydrocarbons**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TPH-CWG - Aliphatic >EC5 - EC6 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | - |
| TPH-CWG - Aliphatic >EC6 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | - |
| TPH-CWG - Aliphatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | - |
| TPH-CWG - Aliphatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | - |
| TPH-CWG - Aliphatic >EC12 - EC16 | mg/kg | 2 | MCERTS | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | - |
| TPH-CWG - Aliphatic >EC16 - EC21 | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | < 8.0 | < 8.0 | - |
| TPH-CWG - Aliphatic >EC21 - EC35 | mg/kg | 8 | MCERTS | 25 | < 8.0 | < 8.0 | < 8.0 | < 8.0 | - |
| TPH-CWG - Aliphatic > EC35 - EC44 | mg/kg | 8.4 | NONE | < 8.4 | < 8.4 | < 8.4 | < 8.4 | < 8.4 | - |
| **TPH-CWG - Aliphatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | 25 | < 10 | < 10 | < 10 | < 10 | - |
| **TPH-CWG - Aliphatic (EC5 - EC44)** | mg/kg | 10 | NONE | 25 | < 10 | < 10 | < 10 | < 10 | - |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TPH-CWG - Aromatic >EC5 - EC7 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | - |
| TPH-CWG - Aromatic >EC7 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | - |
| TPH-CWG - Aromatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | - |
| TPH-CWG - Aromatic >EC10 - EC12 | mg/kg | 1 | MCERTS | 3.5 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | - |
| TPH-CWG - Aromatic >EC12 - EC16 | mg/kg | 2 | MCERTS | 61 | < 2.0 | 20 | < 2.0 | < 2.0 | - |
| TPH-CWG - Aromatic >EC16 - EC21 | mg/kg | 10 | MCERTS | 390 | < 10 | 140 | 17 | < 10 | - |
| TPH-CWG - Aromatic >EC21 - EC35 | mg/kg | 10 | MCERTS | 630 | < 10 | 190 | 24 | < 10 | - |
| TPH-CWG - Aromatic > EC35 - EC44 | mg/kg | 8.4 | NONE | 28 | < 8.4 | < 8.4 | < 8.4 | < 8.4 | - |
| **TPH-CWG - Aromatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | 1100 | < 10 | 360 | 41 | < 10 | - |
| **TPH-CWG - Aromatic (EC5 - EC44)** | mg/kg | 10 | NONE | 1100 | < 10 | 360 | 41 | < 10 | - |



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 15-80970**

**Project / Site name: Lytham Road Manchester**

| **Lab Sample Number** | | | | 497945 | 497946 | 497947 | 497948 | 497949 | 497950 |
|---|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | WS4 | WS4 | WS5 | WS5 | WS5 | WS3 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.10 | 0.70 | 0.20 | 0.40 | 1.20 | 0.20 |
| **Date Sampled** | | | | 15/10/2015 | 15/10/2015 | 15/10/2015 | 15/10/2015 | 15/10/2015 | 16/10/2015 |
| **Time Taken** | | | | 1344 | 1346 | 1513 | 1514 | 1527 | 1414 |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | | |
| Stone Content | % | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Moisture Content | % | N/A | NONE | 24 | 16 | 23 | 17 | 13 | 16 |
| Total mass of sample received | kg | 0.001 | NONE | 0.45 | 0.53 | 0.45 | 0.50 | 0.60 | 0.41 |
| Asbestos in Soil | Type | N/A | ISO 17025 | - | - | - | - | - | - |
| **General Inorganics** | | | | | | | | | |
| pH | pH Units | N/A | MCERTS | 4.9 | 5.8 | 4.8 | 5.6 | 7.1 | 4.7 |
| Total Sulphate as $SO_4$ | mg/kg | 50 | MCERTS | - | 170 | - | - | 170 | - |
| Water Soluble Sulphate (Soil Equivalent) | g/kg | 0.0025 | MCERTS | - | 0.046 | - | - | 0.029 | - |
| Water Soluble SO4 (BRE SD 2:1 Leach Equivalent) | g/l | 0.00125 | MCERTS | - | 0.023 | - | - | 0.015 | - |
| Water Soluble Chloride (2:1) | mg/kg | 1 | MCERTS | - | 14 | - | - | 12 | - |
| Total Sulphur | mg/kg | 50 | NONE | - | 110 | - | - | 110 | - |
| Ammonium as $NH_4$ | mg/kg | 0.5 | MCERTS | - | < 0.5 | - | - | < 0.5 | - |
| Total Organic Carbon (TOC) | % | 0.1 | MCERTS | 3.0 | - | 2.2 | 0.7 | - | 2.5 |
| Water Soluble Nitrate (2:1) as N | mg/kg | 2 | NONE | - | < 2.0 | - | - | < 2.0 | - |
| **Total Phenols** | | | | | | | | | |
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | 1.4 | - | 1.1 | < 1.0 | - | 1.3 |
| **Speciated PAHs** | | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | 0.96 | - | 1.3 | < 0.05 | - | 0.83 |
| Acenaphthylene | mg/kg | 0.1 | MCERTS | 0.48 | - | 1.4 | < 0.10 | - | 0.66 |
| Acenaphthene | mg/kg | 0.1 | MCERTS | 2.2 | - | 2.4 | < 0.10 | - | 2.0 |
| Fluorene | mg/kg | 0.1 | MCERTS | 1.5 | - | 2.7 | < 0.10 | - | 1.8 |
| Phenanthrene | mg/kg | 0.1 | MCERTS | 14 | - | 24 | 0.44 | - | 17 |
| Anthracene | mg/kg | 0.1 | MCERTS | 3.0 | - | 5.5 | < 0.10 | - | 3.8 |
| Fluoranthene | mg/kg | 0.1 | MCERTS | 19 | - | 31 | 0.53 | - | 21 |
| Pyrene | mg/kg | 0.1 | MCERTS | 18 | - | 31 | 0.55 | - | 20 |
| Benzo(a)anthracene | mg/kg | 0.1 | MCERTS | 11 | - | 19 | 0.29 | - | 12 |
| Chrysene | mg/kg | 0.05 | MCERTS | 8.7 | - | 15 | 0.26 | - | 9.3 |
| Benzo(b)fluoranthene | mg/kg | 0.1 | MCERTS | 13 | - | 20 | < 0.10 | - | 14 |
| Benzo(k)fluoranthene | mg/kg | 0.1 | MCERTS | 4.9 | - | 7.7 | < 0.10 | - | 4.5 |
| Benzo(a)pyrene | mg/kg | 0.1 | MCERTS | 9.4 | - | 16 | 0.25 | - | 10 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.1 | MCERTS | 4.2 | - | 6.5 | < 0.10 | - | 4.5 |
| Dibenz(a,h)anthracene | mg/kg | 0.1 | MCERTS | 0.91 | - | 1.4 | < 0.10 | - | 1.1 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | 4.3 | - | 7.1 | < 0.05 | - | 4.7 |
| **Total PAH** | | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 1.6 | MCERTS | 115 | - | 193 | 2.32 | - | 127 |
| **Heavy Metals / Metalloids** | | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 20 | - | 15 | 2.2 | - | 20 |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | 0.5 | - | 0.6 | 0.6 | - | 0.4 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | < 0.2 | - | < 0.2 | < 0.2 | - | < 0.2 |
| Chromium (hexavalent) | mg/kg | 4 | MCERTS | < 4.0 | - | < 4.0 | < 4.0 | - | < 4.0 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 19 | - | 19 | 19 | - | 19 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 51 | - | 79 | 12 | - | 57 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 120 | - | 140 | 13 | - | 160 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | < 0.3 | - | 0.7 | < 0.3 | - | < 0.3 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 16 | - | 20 | 14 | - | 20 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | - | < 1.0 | < 1.0 | - | < 1.0 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 49 | - | 66 | 28 | - | 58 |



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 15-80970**

**Project / Site name: Lytham Road Manchester**

| Lab Sample Number | | | | 497945 | 497946 | 497947 | 497948 | 497949 | 497950 |
|---|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | WS4 | WS4 | WS5 | WS5 | WS5 | WS3 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.10 | 0.70 | 0.20 | 0.40 | 1.20 | 0.20 |
| **Date Sampled** | | | | 15/10/2015 | 15/10/2015 | 15/10/2015 | 15/10/2015 | 15/10/2015 | 16/10/2015 |
| **Time Taken** | | | | 1344 | 1346 | 1513 | 1514 | 1527 | 1414 |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | | |
| **Monoaromatics** | | | | | | | | | |
| Benzene | µg/kg | 1 | MCERTS | < 1.0 | - | < 1.0 | < 1.0 | - | < 1.0 |
| Toluene | µg/kg | 1 | MCERTS | < 1.0 | - | < 1.0 | < 1.0 | - | < 1.0 |
| Ethylbenzene | µg/kg | 1 | MCERTS | < 1.0 | - | < 1.0 | < 1.0 | - | < 1.0 |
| p & m-xylene | µg/kg | 1 | MCERTS | < 1.0 | - | < 1.0 | < 1.0 | - | < 1.0 |
| o-xylene | µg/kg | 1 | MCERTS | < 1.0 | - | < 1.0 | < 1.0 | - | < 1.0 |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | - | < 1.0 | < 1.0 | - | < 1.0 |

**Petroleum Hydrocarbons**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TPH-CWG - Aliphatic >EC5 - EC6 | mg/kg | 0.1 | MCERTS | < 0.1 | - | < 0.1 | < 0.1 | - | < 0.1 |
| TPH-CWG - Aliphatic >EC6 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | - | < 0.1 | < 0.1 | - | < 0.1 |
| TPH-CWG - Aliphatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | - | < 0.1 | < 0.1 | - | < 0.1 |
| TPH-CWG - Aliphatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | - | < 1.0 | < 1.0 | - | < 1.0 |
| TPH-CWG - Aliphatic >EC12 - EC16 | mg/kg | 2 | MCERTS | < 2.0 | - | < 2.0 | < 2.0 | - | < 2.0 |
| TPH-CWG - Aliphatic >EC16 - EC21 | mg/kg | 8 | MCERTS | < 8.0 | - | < 8.0 | < 8.0 | - | < 8.0 |
| TPH-CWG - Aliphatic >EC21 - EC35 | mg/kg | 8 | MCERTS | 12 | - | 8.8 | < 8.0 | - | 12 |
| TPH-CWG - Aliphatic > EC35 - EC44 | mg/kg | 8.4 | NONE | < 8.4 | - | < 8.4 | < 8.4 | - | < 8.4 |
| **TPH-CWG - Aliphatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | 12 | - | < 10 | < 10 | - | 12 |
| **TPH-CWG - Aliphatic (EC5 - EC44)** | mg/kg | 10 | NONE | 12 | - | < 10 | < 10 | - | 12 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TPH-CWG - Aromatic >EC5 - EC7 | mg/kg | 0.1 | MCERTS | < 0.1 | - | < 0.1 | < 0.1 | - | < 0.1 |
| TPH-CWG - Aromatic >EC7 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | - | < 0.1 | < 0.1 | - | < 0.1 |
| TPH-CWG - Aromatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | - | < 0.1 | < 0.1 | - | < 0.1 |
| TPH-CWG - Aromatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | - | 1.7 | < 1.0 | - | 1.2 |
| TPH-CWG - Aromatic >EC12 - EC16 | mg/kg | 2 | MCERTS | 21 | - | 31 | < 2.0 | - | 21 |
| TPH-CWG - Aromatic >EC16 - EC21 | mg/kg | 10 | MCERTS | 120 | - | 190 | < 10 | - | 120 |
| TPH-CWG - Aromatic >EC21 - EC35 | mg/kg | 10 | MCERTS | 180 | - | 260 | < 10 | - | 200 |
| TPH-CWG - Aromatic > EC35 - EC44 | mg/kg | 8.4 | NONE | < 8.4 | - | 9.9 | < 8.4 | - | 9.7 |
| **TPH-CWG - Aromatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | 320 | - | 480 | < 10 | - | 350 |
| **TPH-CWG - Aromatic (EC5 - EC44)** | mg/kg | 10 | NONE | 320 | - | 490 | < 10 | - | 360 |



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 15-80970**

**Project / Site name: Lytham Road Manchester**

| Lab Sample Number | | | | 497951 | 497952 | 497953 | 497954 | 497955 | 497956 |
|---|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | WS6 | WS6 | WS7 | WS7 | WS9 | WS9 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 0.15 | 1.00 | 0.20 | 0.50 | 0.40 | 0.90 |
| Date Sampled | | | | 16/10/2015 | 16/10/2015 | 16/10/2015 | 16/10/2015 | 16/10/2015 | 16/10/2015 |
| Time Taken | | | | 0851 | 0855 | 1015 | 1016 | 1150 | 1155 |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | | |
| Stone Content | % | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Moisture Content | % | N/A | NONE | 22 | 13 | 19 | 15 | 21 | 15 |
| Total mass of sample received | kg | 0.001 | NONE | 0.49 | 0.72 | 0.90 | 1.2 | 0.88 | 0.80 |
| Asbestos in Soil | Type | N/A | ISO 17025 | - | - | - | Not-detected | Not-detected | - |
| **General Inorganics** | | | | | | | | | |
| pH | pH Units | N/A | MCERTS | 4.4 | 6.8 | 4.5 | 5.9 | 5.4 | 7.0 |
| Total Sulphate as $SO_4$ | mg/kg | 50 | MCERTS | - | 140 | - | - | - | - |
| Water Soluble Sulphate (Soil Equivalent) | g/kg | 0.0025 | MCERTS | - | 0.031 | - | - | - | - |
| Water Soluble SO4 (BRE SD 2:1 Leach Equivalent) | g/l | 0.00125 | MCERTS | - | 0.015 | - | - | - | - |
| Water Soluble Chloride (2:1) | mg/kg | 1 | MCERTS | - | 8.4 | - | - | - | - |
| Total Sulphur | mg/kg | 50 | NONE | - | 92 | - | - | - | - |
| Ammonium as $NH_4$ | mg/kg | 0.5 | MCERTS | - | < 0.5 | - | - | - | - |
| Total Organic Carbon (TOC) | % | 0.1 | MCERTS | 2.9 | - | 2.2 | 0.8 | 1.5 | 0.8 |
| Water Soluble Nitrate (2:1) as N | mg/kg | 2 | NONE | - | < 2.0 | - | - | - | - |
| **Total Phenols** | | | | | | | | | |
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | - | 2.0 | < 1.0 | < 1.0 | < 1.0 |
| **Speciated PAHs** | | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | 2.9 | - | 3.3 | < 0.05 | 0.80 | < 0.05 |
| Acenaphthylene | mg/kg | 0.1 | MCERTS | 1.2 | - | 1.4 | < 0.10 | 0.40 | < 0.10 |
| Acenaphthene | mg/kg | 0.1 | MCERTS | 4.0 | - | 6.3 | < 0.10 | 2.2 | < 0.10 |
| Fluorene | mg/kg | 0.1 | MCERTS | 3.5 | - | 5.0 | < 0.10 | 1.4 | < 0.10 |
| Phenanthrene | mg/kg | 0.1 | MCERTS | 29 | - | 41 | < 0.10 | 16 | < 0.10 |
| Anthracene | mg/kg | 0.1 | MCERTS | 6.2 | - | 7.6 | < 0.10 | 3.9 | < 0.10 |
| Fluoranthene | mg/kg | 0.1 | MCERTS | 32 | - | 40 | < 0.10 | 23 | < 0.10 |
| Pyrene | mg/kg | 0.1 | MCERTS | 30 | - | 39 | < 0.10 | 22 | < 0.10 |
| Benzo(a)anthracene | mg/kg | 0.1 | MCERTS | 19 | - | 24 | < 0.10 | 13 | < 0.10 |
| Chrysene | mg/kg | 0.05 | MCERTS | 14 | - | 19 | < 0.05 | 9.6 | < 0.05 |
| Benzo(b)fluoranthene | mg/kg | 0.1 | MCERTS | 20 | - | 25 | < 0.10 | 16 | < 0.10 |
| Benzo(k)fluoranthene | mg/kg | 0.1 | MCERTS | 8.1 | - | 11 | < 0.10 | 5.2 | < 0.10 |
| Benzo(a)pyrene | mg/kg | 0.1 | MCERTS | 16 | - | 19 | < 0.10 | 9.8 | < 0.10 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.1 | MCERTS | 6.6 | - | 7.5 | < 0.10 | 4.9 | < 0.10 |
| Dibenz(a,h)anthracene | mg/kg | 0.1 | MCERTS | 1.8 | - | 2.0 | < 0.10 | 1.1 | < 0.10 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | 7.1 | - | 7.8 | < 0.05 | 5.1 | < 0.05 |
| **Total PAH** | | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 1.6 | MCERTS | 201 | - | 258 | < 1.60 | 134 | < 1.60 |
| **Heavy Metals / Metalloids** | | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 23 | - | 24 | 3.7 | 14 | 6.2 |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | < 0.2 | - | 0.4 | < 0.2 | 0.3 | 0.3 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | < 0.2 | - | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Chromium (hexavalent) | mg/kg | 4 | MCERTS | < 4.0 | - | < 4.0 | < 4.0 | < 4.0 | < 4.0 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 21 | - | 20 | 22 | 21 | 30 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 56 | - | 77 | 14 | 83 | 21 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 170 | - | 200 | 12 | 64 | 11 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | 0.6 | - | 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 18 | - | 23 | 20 | 27 | 34 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | - | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 57 | - | 79 | 45 | 71 | 52 |



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 15-80970**

**Project / Site name: Lytham Road Manchester**

| Lab Sample Number | | | | 497951 | 497952 | 497953 | 497954 | 497955 | 497956 |
|---|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | WS6 | WS6 | WS7 | WS7 | WS9 | WS9 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 0.15 | 1.00 | 0.20 | 0.50 | 0.40 | 0.90 |
| Date Sampled | | | | 16/10/2015 | 16/10/2015 | 16/10/2015 | 16/10/2015 | 16/10/2015 | 16/10/2015 |
| Time Taken | | | | 0851 | 0855 | 1015 | 1016 | 1150 | 1155 |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | | |
| **Monoaromatics** | | | | | | | | | |
| Benzene | µg/kg | 1 | MCERTS | < 1.0 | - | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | µg/kg | 1 | MCERTS | < 1.0 | - | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | µg/kg | 1 | MCERTS | < 1.0 | - | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| p & m-xylene | µg/kg | 1 | MCERTS | < 1.0 | - | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-xylene | µg/kg | 1 | MCERTS | < 1.0 | - | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | - | < 1.0 | < 1.0 | < 1.0 | < 1.0 |

**Petroleum Hydrocarbons**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TPH-CWG - Aliphatic >EC5 - EC6 | mg/kg | 0.1 | MCERTS | < 0.1 | - | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC6 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | - | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | - | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | - | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH-CWG - Aliphatic >EC12 - EC16 | mg/kg | 2 | MCERTS | < 2.0 | - | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| TPH-CWG - Aliphatic >EC16 - EC21 | mg/kg | 8 | MCERTS | < 8.0 | - | < 8.0 | < 8.0 | < 8.0 | < 8.0 |
| TPH-CWG - Aliphatic >EC21 - EC35 | mg/kg | 8 | MCERTS | 14 | - | 8.5 | < 8.0 | < 8.0 | < 8.0 |
| TPH-CWG - Aliphatic > EC35 - EC44 | mg/kg | 8.4 | NONE | < 8.4 | - | < 8.4 | < 8.4 | < 8.4 | < 8.4 |
| **TPH-CWG - Aliphatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | 14 | - | < 10 | < 10 | < 10 | < 10 |
| **TPH-CWG - Aliphatic (EC5 - EC44)** | mg/kg | 10 | NONE | 14 | - | < 10 | < 10 | < 10 | < 10 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TPH-CWG - Aromatic >EC5 - EC7 | mg/kg | 0.1 | MCERTS | < 0.1 | - | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aromatic >EC7 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | - | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aromatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | - | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aromatic >EC10 - EC12 | mg/kg | 1 | MCERTS | 3.2 | - | 3.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH-CWG - Aromatic >EC12 - EC16 | mg/kg | 2 | MCERTS | 31 | - | 40 | < 2.0 | 12 | < 2.0 |
| TPH-CWG - Aromatic >EC16 - EC21 | mg/kg | 10 | MCERTS | 190 | - | 200 | < 10 | 100 | < 10 |
| TPH-CWG - Aromatic >EC21 - EC35 | mg/kg | 10 | MCERTS | 250 | - | 270 | < 10 | 180 | < 10 |
| TPH-CWG - Aromatic > EC35 - EC44 | mg/kg | 8.4 | NONE | < 8.4 | - | < 8.4 | < 8.4 | < 8.4 | < 8.4 |
| **TPH-CWG - Aromatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | 480 | - | 510 | < 10 | 300 | < 10 |
| **TPH-CWG - Aromatic (EC5 - EC44)** | mg/kg | 10 | NONE | 480 | - | 510 | < 10 | 300 | < 10 |



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**Analytical Report Number : 15-80970**

**Project / Site name: Lytham Road Manchester**

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

| Lab Sample Number | Sample Reference | Sample Number | Depth (m) | Sample Description * |
|---|---|---|---|---|
| 497933 | TP1 | None Supplied | 0.30 | Brown loam and clay with gravel. |
| 497934 | TP2 | None Supplied | 0.30 | Brown loam and sand with gravel. |
| 497935 | TP3 | None Supplied | 0.10 | Brown loam and sand with gravel. |
| 497936 | TP3 | None Supplied | 0.70 | Light brown clay and sand with vegetation. |
| 497937 | TP4 | None Supplied | 0.15 | Brown loam and sand with gravel. |
| 497938 | TP5 | None Supplied | 1.10 | Brown gravelly sand. |
| 497939 | TP5A | None Supplied | 0.20 | Brown loam and sand with gravel. |
| 497940 | TP5A | None Supplied | 1.10 | Brown clay and sand. |
| 497941 | TP8 | None Supplied | 0.10 | Brown loam and sand with gravel. |
| 497942 | WS1 | None Supplied | 0.40 | Brown loam and clay. |
| 497943 | WS1 | None Supplied | 0.70 | Brown clay and sand with vegetation. |
| 497944 | WS2 | None Supplied | 0.15 | Brown loam and sand with gravel and brick. |
| 497945 | WS4 | None Supplied | 0.10 | Brown loam and clay with vegetation. |
| 497946 | WS4 | None Supplied | 0.70 | Light brown clay and sand with vegetation. |
| 497947 | WS5 | None Supplied | 0.20 | Brown loam and clay with vegetation. |
| 497948 | WS5 | None Supplied | 0.40 | Brown clay and sand with vegetation. |
| 497949 | WS5 | None Supplied | 1.20 | Brown clay and sand with vegetation. |
| 497950 | WS3 | None Supplied | 0.20 | Brown sandy loam with gravel and vegetation. |
| 497951 | WS6 | None Supplied | 0.15 | Brown loam and sand with gravel and vegetation. |
| 497952 | WS6 | None Supplied | 1.00 | Brown clay and sand. |
| 497953 | WS7 | None Supplied | 0.20 | Brown loam and clay with gravel and vegetation. |
| 497954 | WS7 | None Supplied | 0.50 | Brown clay and sand. |
| 497955 | WS9 | None Supplied | 0.40 | Brown loam and clay with vegetation. |
| 497956 | WS9 | None Supplied | 0.90 | Brown clay and sand. |



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**Analytical Report Number : 15-80970**

**Project / Site name: Lytham Road Manchester**

**Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| Ammonium as NH4 in soil | Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L082-PL | W | MCERTS |
| Asbestos identification in soil | Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques. | In house method based on HSG 248 | A001-PL | D | ISO 17025 |
| Boron, water soluble, in soil | Determination of water soluble boron in soil by hot water extract followed by ICP-OES. | In-house method based on Second Site Properties version 3 | L038-PL | D | MCERTS |
| BTEX and MTBE in soil | Determination of BTEX in soil by headspace GC-MS. | In-house method based on USEPA8260 | L073S-PL | W | MCERTS |
| Chloride, water soluble, in soil | Determination of Chloride colorimetrically by discrete analyser. | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests. 2:1 extraction. | L082-PL | D | MCERTS |
| Hexavalent chromium in soil | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry. | In-house method | L080-PL | W | MCERTS |
| Metals in soil by ICP-OES | Determination of metals in soil by aqua-regia digestion followed by ICP-OES. | In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil. | L038-PL | D | MCERTS |
| Moisture Content | Moisture content, determined gravimetrically. | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests | L019-UK/PL | W | NONE |
| Monohydric phenols in soil | Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar) | L080-PL | W | MCERTS |
| pH in soil (automated) | Determination of pH in soil by addition of water followed by electrometric measurement. | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests | L099-PL | D | MCERTS |
| Speciated EPA-16 PAHs in soil | Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards. | In-house method based on USEPA 8270 | L064-PL | D | MCERTS |
| Stones content of soil | Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight. | In-house method based on British Standard Methods and MCERTS requirements. | L019-UK/PL | D | NONE |
| Sulphate, water soluble, in soil | Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent). | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES. | L038-PL | D | MCERTS |
| Total organic carbon in soil | Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate. | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests | L023-PL | D | MCERTS |
| Total sulphate (as SO4 in soil) | Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES. | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests | L038-PL | D | MCERTS |
| Total Sulphur in soil | Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES. | In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil | L038-PL | D | NONE |
| TPH in (Soil) | Determination of TPH bands by GC-MS/GC-FID | In-house method, TPH with carbon banding. | L064/076PL | D | NONE |



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**Analytical Report Number : 15-80970**

**Project / Site name: Lytham Road Manchester**

**Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| TPHCWG (Soil) | Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID. | In-house method | L076-PL | W | MCERTS |
| Water Soluble Nitrate (2:1) as N in soil | Determination of nitrate by reaction with sodium salicylate and colorimetry. | In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction. | L078-PL | D | NONE |

**For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.**
**For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.**
**Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.**



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# Analytical Report Number : 15-81842

| | | | |
|---|---|---|---|
| **Project / Site name:** | Lythan Road Manchester | **Samples received on:** | 21/10/2015 |
| **Your job number:** | 12-12-16-1-1163 | **Samples instructed on:** | 04/11/2015 |
| **Your order number:** | | **Analysis completed by:** | 12/11/2015 |
| **Report Issue Number:** | 1 | **Report issued on:** | 12/11/2015 |
| **Samples Analysed:** | 3 leachate samples | | |

**Signed:**

Rexona Rahman
Reporting Manager
**For & on behalf of i2 Analytical Ltd.**

**Signed:**

Emma Winter
Assistant Reporting Manager
**For & on behalf of i2 Analytical Ltd.**

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

| | |
|---|---|
| soils | - 4 weeks from reporting |
| leachates | - 2 weeks from reporting |
| waters | - 2 weeks from reporting |
| asbestos | - 6 months from reporting |

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**Analytical Report Number: 15-81842**

**Project / Site name: Lythan Road Manchester**

| Lab Sample Number | | | | 502950 | 502951 | 502952 | | |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | TP3 | TP3 | TP5 | | |
| Sample Number | | | | 497935 | 497936 | 497938 | | |
| Depth (m) | | | | 0.10 | 0.70 | 0.10 | | |
| Date Sampled | | | | 14/10/2015 | 14/10/2015 | 14/10/2015 | | |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | | |
| **Analytical Parameter (Leachate Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **General Inorganics** | | | | | | | | |
| pH | pH Units | N/A | ISO 17025 | 7.7 | 7.8 | 7.4 | | |
| Total Organic Carbon (TOC) | mg/l | 0.1 | NONE | 6.65 | 4.53 | 2.59 | | |
| **Total Phenols** | | | | | | | | |
| Total Phenols (monohydric) | µg/l | 10 | ISO 17025 | < 10 | < 10 | < 10 | | |
| **Speciated PAHs** | | | | | | | | |
| Naphthalene | µg/l | 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | | |
| Acenaphthylene | µg/l | 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | | |
| Acenaphthene | µg/l | 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | | |
| Fluorene | µg/l | 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | | |
| Phenanthrene | µg/l | 0.01 | NONE | 1.4 | < 0.01 | < 0.01 | | |
| Anthracene | µg/l | 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | | |
| Fluoranthene | µg/l | 0.01 | NONE | 2.1 | < 0.01 | < 0.01 | | |
| Pyrene | µg/l | 0.01 | NONE | 2.2 | < 0.01 | < 0.01 | | |
| Benzo(a)anthracene | µg/l | 0.01 | NONE | 0.78 | < 0.01 | < 0.01 | | |
| Chrysene | µg/l | 0.01 | NONE | 1.3 | < 0.01 | < 0.01 | | |
| Benzo(b)fluoranthene | µg/l | 0.01 | NONE | 0.72 | < 0.01 | < 0.01 | | |
| Benzo(k)fluoranthene | µg/l | 0.01 | NONE | 0.42 | < 0.01 | < 0.01 | | |
| Benzo(a)pyrene | µg/l | 0.01 | NONE | 0.50 | < 0.01 | < 0.01 | | |
| Indeno(1,2,3-cd)pyrene | µg/l | 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | | |
| Dibenz(a,h)anthracene | µg/l | 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | | |
| Benzo(ghi)perylene | µg/l | 0.01 | NONE | < 0.01 | < 0.01 | < 0.01 | | |
| **Total PAH** | | | | | | | | |
| Total EPA-16 PAHs | µg/l | 0.2 | NONE | 9.4 | < 0.2 | < 0.2 | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (dissolved) | µg/l | 1.1 | ISO 17025 | < 1.1 | < 1.1 | 15 | | |
| Boron (dissolved) | µg/l | 10 | ISO 17025 | 11 | < 10 | 16 | | |
| Cadmium (dissolved) | µg/l | 0.08 | ISO 17025 | < 0.08 | < 0.08 | < 0.08 | | |
| Chromium (hexavalent) | µg/l | 5 | NONE | < 5.0 | < 5.0 | < 5.0 | | |
| Chromium (dissolved) | µg/l | 0.4 | ISO 17025 | 1.3 | 3.1 | 1.9 | | |
| Copper (dissolved) | µg/l | 0.7 | ISO 17025 | 16 | 4.0 | 11 | | |
| Lead (dissolved) | µg/l | 1 | ISO 17025 | 3.3 | < 1.0 | 10 | | |
| Mercury (dissolved) | µg/l | 0.5 | ISO 17025 | < 0.5 | < 0.5 | < 0.5 | | |
| Nickel (dissolved) | µg/l | 0.3 | ISO 17025 | 2.6 | 2.1 | 2.9 | | |
| Selenium (dissolved) | µg/l | 4 | ISO 17025 | < 4.0 | < 4.0 | < 4.0 | | |
| Zinc (dissolved) | µg/l | 0.4 | ISO 17025 | 8.9 | 8.0 | 15 | | |



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**Analytical Report Number: 15-81842**

**Project / Site name: Lythan Road Manchester**

| **Lab Sample Number** | | | | 502950 | 502951 | 502952 | | |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP3 | TP3 | TP5 | | |
| **Sample Number** | | | | 497935 | 497936 | 497938 | | |
| **Depth (m)** | | | | 0.10 | 0.70 | 0.10 | | |
| **Date Sampled** | | | | 14/10/2015 | 14/10/2015 | 14/10/2015 | | |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | | |
| **Analytical Parameter (Leachate Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **Monoaromatics** | | | | | | | | |
| Benzene | µg/l | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | | |
| Toluene | µg/l | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | | |
| Ethylbenzene | µg/l | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | | |
| p & m-xylene | µg/l | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | | |
| o-xylene | µg/l | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | | |
| MTBE (Methyl Tertiary Butyl Ether) | µg/l | 10 | NONE | < 10 | < 10 | < 10 | | |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPH-CWG - Aliphatic >C5 - C6 | µg/l | 10 | NONE | < 10 | < 10 | < 10 | | |
| TPH-CWG - Aliphatic >C6 - C8 | µg/l | 10 | NONE | < 10 | < 10 | < 10 | | |
| TPH-CWG - Aliphatic >C8 - C10 | µg/l | 10 | NONE | < 10 | < 10 | < 10 | | |
| TPH-CWG - Aliphatic >C10 - C12 | µg/l | 10 | NONE | < 10 | < 10 | < 10 | | |
| TPH-CWG - Aliphatic >C12 - C16 | µg/l | 10 | NONE | < 10 | < 10 | < 10 | | |
| TPH-CWG - Aliphatic >C16 - C21 | µg/l | 10 | NONE | < 10 | < 10 | < 10 | | |
| TPH-CWG - Aliphatic >C21 - C35 | µg/l | 10 | NONE | < 10 | < 10 | < 10 | | |
| TPH-CWG - Aliphatic (C5 - C35) | µg/l | 10 | NONE | < 10 | < 10 | < 10 | | |
| TPH-CWG - Aliphatic (C5 - C44) | mg/l | 10 | NONE | < 10 | < 10 | < 10 | | |
| TPH-CWG - Aromatic >C5 - C7 | µg/l | 10 | NONE | < 10 | < 10 | < 10 | | |
| TPH-CWG - Aromatic >C7 - C8 | µg/l | 10 | NONE | < 10 | < 10 | < 10 | | |
| TPH-CWG - Aromatic >C8 - C10 | µg/l | 10 | NONE | < 10 | < 10 | < 10 | | |
| TPH-CWG - Aromatic >C10 - C12 | µg/l | 10 | NONE | < 10 | < 10 | < 10 | | |
| TPH-CWG - Aromatic >C12 - C16 | µg/l | 10 | NONE | < 10 | < 10 | < 10 | | |
| TPH-CWG - Aromatic >C16 - C21 | µg/l | 10 | NONE | < 10 | < 10 | < 10 | | |
| TPH-CWG - Aromatic >C21 - C35 | µg/l | 10 | NONE | < 10 | < 10 | < 10 | | |
| TPH-CWG - Aromatic >C35 - C44 | µg/l | 10 | NONE | < 10 | < 10 | < 10 | | |
| TPH-CWG - Aromatic (C5 - C35) | µg/l | 10 | NONE | < 10 | < 10 | < 10 | | |
| TPH-CWG - Aromatic (C5 - C44) | mg/l | 10 | NONE | < 10 | < 10 | < 10 | | |



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**Analytical Report Number : 15-81842**

**Project / Site name: Lythan Road Manchester**

**Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| Boron in leachate | Determination of boron by acidification followed by ICP-OES. | In-house method based on MEWAM | L039-PL | W | ISO 17025 |
| BTEX and MTBE in leachates | Determination of BTEX and MTBE in leachates by headspace GC-MS. | In-house method based on USEPA8260 | L073W-PL | W | NONE |
| Hexavalent chromium in leachate | Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry. | In-house method | L080-PL | W | NONE |
| Metals by ICP-OES in leachate | Determination of metals in leachate by acidification followed by ICP-OES. | In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil. | L039-PL | W | ISO 17025 |
| Monohydric phenols in leachate | Determination of phenols in leachate by distillation followed by colorimetry. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar) | L080-PL | W | ISO 17025 |
| pH in leachate | Determination of pH in leachate by electrometric measurement. | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests | L005-PL | W | ISO 17025 |
| Speciated EPA-16 PAHs in leachate | Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. | In-house method based on USEPA 8270 | L070-PL | W | NONE |
| Total organic carbon in leachate | Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L037-PL | W | NONE |
| TPH in (Leachate) | Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS. | In-house method, TPH with carbon banding. | L070-PL | W | NONE |
| TPH7 (Leachates) | Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS. | In-house method | L070-PL | W | NONE |

**For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.**
**For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.**
**Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.**



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The results included within the report are representative of the samples submitted for analysis.

# Appendix G

# Statistical Analysis - Inputs and Outputs

| | |
|---|---|
| Client/client ref | NPS North West |
| Project ref | 12-12-16-1-1163 |
| Site ref | Lytham Road Manchester |
| Data description | Preliminary Site Investigation |
| Contaminant(s) | Metals and BTEX |
| Test scenario | Planning: is true mean lower than critical concentration (μ < Cc)? |
| Date | 29 November 2015 |
| User details | C Riley |

Statistics Calculator (Version 2)

# Input data

This spreadsheet has been produced based on the document 'Guidance on Comparing Soil Contamination Data with a Critical Concentration (CIEH/CL:AIRE, 2008)'. Users of this spreadsheet should always refer to this guidance, the User Manual and to relevant guidance on UK legislation and policy, in order to understand how the procedure should be applied in an appropriate context.

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Go to summary | Project details | Select all filters | Deselect all filters | Paste Values

| Easting | Northing | Depth (m) | User-defined 1 | User-defined 2 | User-defined 3 | Sample ID | Arsenic | Boron (water soluble) | Cadmium | Chromium | Chromium (hexavalent) | Copper | Lead | Mercury | Nickel | Selenium | Zinc | Benzene | Toluene | Ethylbenzene | p & m-xylene | o-xylene | MTBE (Methyl Tertiary Butyl Ether) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.3 | | | | TP1 | 17 | 0.6 | < 0.2 | 19 | < 4.0 | 95 | 260 | < 0.3 | 22 | < 1.0 | 97 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |
| | | 0.3 | | | | TP2 | 20 | 0.3 | < 0.2 | 17 | < 4.0 | 180 | 40 | < 0.3 | 20 | < 1.0 | 220 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |
| | | 0.1 | | | | TP3 | 18 | 0.5 | < 0.2 | 20 | < 4.0 | 67 | 150 | 0.4 | 22 | < 1.0 | 93 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |
| | | 0.7 | | | | TP3 | 5.6 | 0.4 | < 0.2 | 23 | < 4.0 | 15 | 14 | < 0.3 | 18 | < 1.0 | 36 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |
| | | 0.15 | | | | TP4 | 31 | 0.3 | < 0.2 | 21 | < 4.0 | 200 | 320 | 0.6 | 29 | < 1.0 | 130 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |
| | | 1.1 | | | | TP5 | 120 | 0.8 | < 0.2 | 26 | < 4.0 | 360 | 740 | 0.7 | 92 | < 1.0 | 370 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |
| | | 0.2 | | | | TP5A | 75 | 0.6 | < 0.2 | 28 | < 4.0 | 260 | 730 | 1.5 | 58 | < 1.0 | 270 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |
| | | 1.1 | | | | TP5A | 5.4 | 1.4 | < 0.2 | 28 | < 4.0 | 18 | 14 | < 0.3 | 43 | < 1.0 | 56 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |
| | | 0.1 | | | | TP8 | 19 | 0.7 | < 0.2 | 21 | < 4.0 | 72 | 140 | < 0.3 | 17 | < 1.0 | 51 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |
| | | 0.4 | | | | WS1 | 28 | < 0.2 | < 0.2 | 21 | < 4.0 | 100 | 49 | < 0.3 | 57 | < 1.0 | 78 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |
| | | 0.7 | | | | WS1 | 2.8 | 0.7 | < 0.2 | 20 | < 4.0 | 19 | 20 | < 0.3 | 16 | < 1.0 | 37 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |
| | | 0.1 | | | | WS4 | 20 | 0.5 | < 0.2 | 19 | < 4.0 | 51 | 120 | < 0.3 | 16 | < 1.0 | 49 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |
| | | 0.2 | | | | WS5 | 15 | 0.6 | < 0.2 | 19 | < 4.0 | 79 | 140 | 0.7 | 20 | < 1.0 | 66 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |
| | | 0.4 | | | | WS5 | 2.2 | 0.6 | < 0.2 | 19 | < 4.0 | 12 | 13 | < 0.3 | 14 | < 1.0 | 28 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |
| | | 0.2 | | | | WS3 | 20 | 0.4 | < 0.2 | 19 | < 4.0 | 57 | 160 | < 0.3 | 20 | < 1.0 | 58 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |
| | | 0.15 | | | | WS6 | 23 | < 0.2 | < 0.2 | 21 | < 4.0 | 56 | 170 | 0.6 | 18 | < 1.0 | 57 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |
| | | 0.2 | | | | WS7 | 24 | 0.4 | < 0.2 | 20 | < 4.0 | 77 | 200 | 0.3 | 23 | < 1.0 | 79 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |
| | | 0.5 | | | | WS7 | 3.7 | < 0.2 | < 0.2 | 22 | < 4.0 | 14 | 12 | < 0.3 | 20 | < 1.0 | 45 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |
| | | 0.4 | | | | WS9 | 14 | 0.3 | < 0.2 | 21 | < 4.0 | 83 | 64 | < 0.3 | 27 | < 1.0 | 71 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |
| | | 0.9 | | | | WS9 | 6.2 | 0.3 | < 0.2 | 30 | < 4.0 | 21 | 11 | < 0.3 | 34 | < 1.0 | 52 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | | | |

Client/client ref: NPS North West
Project ref: 12-12-16-1-1163
Site ref: Lytham Road Manchester
Data description: Preliminary Site Investigation
Contaminant(s): Metals and BTEX
Test scenario: Planning
Date: 29 November 2015
User details: C Riley

| | Arsenic | Boron (water soluble) | Cadmium | Chromium | Chromium (hexavalent) | Copper | Lead | Mercury | Nickel | Selenium | Zinc | Benzene | Toluene | Ethylbenzene | p & m-xylene | o-xylene | MTBE (Methyl Tertiary Butyl Ether) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Critical concentration, $C_c$** | **79** | **21000** | **120** | **1500** | **7.7** | **12000** | **630** | **16** | **230** | **1100** | **81000** | **72** | **56000** | **24000** | **41000** | **41000** | | | | |
| **Notes** | LQM POS Resi | LQM POS Resi | LQM POS Resi | LQM POS Resi | LQM POS Resi | LQM POS Resi | C4SL POS Resi | LQM POS Resi | LQM POS Resi | LQM POS Resi | LQM POS Resi | LQM POS Resi | LQM POS Resi | LQM POS Resi | LQM POS Resi | LQM POS Resi | LQM POS Resi | | | |
| **Full dataset size** | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 0 | 0 | 0 |
| **Outliers present?** | Yes | Yes | No | No | No | Yes | Yes | Yes | Yes | No | Yes | No | No | No | No | No | No | | | |
| **Number of outliers temporarily excluded** | 0 | | | | | | | | | | | | | | | | | | | |
| **Number removed by filter** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sample size, n** | **20** | **20** | **20** | **20** | **20** | **20** | **20** | **20** | **20** | **20** | **20** | **20** | **20** | **20** | **20** | **20** | **20** | **0** | **0** | **0** |
| **Sample mean, $\bar{x}$** | 23.495 | 0.485 | 0.1 | 21.7 | 2 | 91.8 | 168.35 | 0.3375 | 29.3 | 0.5 | 97.15 | 0.0005 | 0.0005 | 0.0005 | 0.0005 | 0.0005 | 0.0005 | No Data | No Data | No Data |
| **Standard deviation, s** | 27.677684 | 0.2978431 | 1.424E-17 | 3.5407403 | 0 | 91.619695 | 213.19481 | 0.3413884 | 19.499258 | 0 | 88.569494 | 2.225E-19 | 2.225E-19 | 2.225E-19 | 2.225E-19 | 2.225E-19 | 2.225E-19 | | | |
| **Number of non-detects** | 0 | **3** | **20** | 0 | **20** | 0 | 0 | **13** | 0 | **20** | 0 | **20** | **20** | **20** | **20** | **20** | **20** | 0 | 0 | 0 |
| **Set non-detect values to:** | | | | | | | | | | | | | | | | | | | | |
| **Distribution** | Non-normal | Non-normal | Non-normal | Non-normal | Single value | Non-normal | Non-normal | Non-normal | Non-normal | Single value | Non-normal | Non-normal | Non-normal | Non-normal | Non-normal | Non-normal | Non-normal | | | |
| **Statistical approach** | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Test scenario:** | | | | | **Evidence level required:** | | **95%** | | | | | | | | | | | | | |
| **t statistic, $t_0$ (or $k_0$)** | -8.968449361 | -315309.2303 | -3.76596E+19 | -1867.168434 | N/A | -581.262464 | -9.683920165 | -205.176349 | -46.0303514 | N/A | -4085.024404 | -1.44732E+21 | -1.1257E+24 | -4.82445E+23 | -8.24177E+23 | -8.24177E+23 | | | | |
| **Upper confidence limit** (on true mean concentration, μ) | 50.471869 | 0.7753016 | 0.1 | 25.151087 | 2 | 181.09983 | 376.1466 | 0.6702443 | 48.305526 | 0.5 | 183.47686 | 0.0005 | 0.0005 | 0.0005 | 0.0005 | 0.0005 | 0.0005 | | | |
| **Evidence level** | **99%** | **100%** | **100%** | **100%** | **100%** | **100%** | **99%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | | | | |
| **Base decision on:** | | | | | | | | | | | | | | | | | | | | |
| **Result** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | | | | |
| **Select dataset** | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**Back to data** | **Go to outlier test** | **Go to normality test** | **Show individual summary**

| | |
|---|---|
| Client/client ref | NPS North West |
| Project ref | 12-12-16-1-1163 |
| Site ref | Lytham Road Manchester |
| Data description | Preliminary Site Investigation |
| Contaminant(s) | PAH |
| Test scenario | Planning: is true mean lower than critical concentration (μ < Cc)? |
| Date | 29 November 2015 |
| User details | C Riley |

Statistics Calculator (Version 2)

# Input data

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Go to summary | Project details | Select all filters | Deselect all filters | Paste Values

| Easting | Northing | Depth (m) | User-defined 1 | User-defined 2 | User-defined 3 | Sample ID | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(ghi)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.3 | Topsoil | | | TP1 | 5.3 | 1.1 | 6.6 | 22 | 19 | 26 | 8.2 | 8.3 | 19 | 2 | 39 | 4.1 | 8.2 | 2.7 | 32 | 35 | | | | |
| | | 0.3 | MG | | | TP2 | | | | | | | | | | | | | | | | | | | | |
| | | 0.1 | Topsoil | | | TP3 | 7.9 | 1.2 | 11 | 43 | 36 | 32 | 15 | 29 | 33 | 3.9 | 72 | 5.6 | 15 | 3.1 | 55 | 68 | | | | |
| | | 0.7 | Clay | | | TP3 | | | | | | | | | | | | | | | | | | | | |
| | | 0.15 | Topsoil | | | TP4 | 3.6 | 0.75 | 6.7 | 23 | 20 | 22 | 8.9 | 13 | 21 | 2.3 | 44 | 2.7 | 8.5 | 1.8 | 31 | 40 | | | | |
| | | 1.1 | MG | | | TP5 | | | | | | | | | | | | | | | | | | | | |
| | | 0.2 | Topsoil | | | TP5A | 5.9 | 2.3 | 11 | 35 | 32 | 38 | 14 | 17 | 31 | 3.6 | 62 | 5 | 14 | 3.1 | 48 | 57 | | | | |
| | | 1.1 | clay | | | TP5A | | | | | | | | | | | | | | | | | | | | |
| | | 0.1 | Topsoil | | | TP8 | 2.7 | 0.76 | 5.2 | 16 | 14 | 13 | 6.3 | 10 | 13 | 1.5 | 28 | 2.2 | 6.2 | 0.83 | 21 | 27 | | | | |
| | | 0.4 | MG | | | WS1 | | | | | | | | | | | | | | | | | | | | |
| | | 0.7 | Clay | | | WS1 | | | | | | | | | | | | | | | | | | | | |
| | | 0.1 | Topsoil | | | WS4 | 2.2 | 0.48 | 3 | 11 | 9.4 | 13 | 4.3 | 4.9 | 8.7 | 0.91 | 19 | 1.5 | 4.2 | 0.96 | 14 | 18 | | | | |
| | | 0.2 | Topsoil | | | WS5 | 2.4 | 1.4 | 5.5 | 19 | 16 | 20 | 7.1 | 7.7 | 15 | 1.4 | 31 | 2.7 | 6.5 | 1.3 | 24 | 31 | | | | |
| | | 0.4 | Clay | | | WS5 | | | | | | | | | | | | | | | | | | | | |
| | | 0.2 | Topsoil | | | WS3 | 2 | 0.66 | 3.8 | 12 | 10 | 14 | 4.7 | 4.5 | 9.3 | 1.1 | 21 | 1.8 | 4.5 | 0.83 | 17 | 20 | | | | |
| | | 0.15 | Topsoil | | | WS6 | 4 | 1.2 | 6.2 | 19 | 16 | 20 | 7.1 | 8.1 | 14 | 1.8 | 32 | 3.5 | 6.6 | 2.9 | 29 | 30 | | | | |
| | | 0.2 | Topsoil | | | WS7 | 6.3 | 1.4 | 7.6 | 24 | 19 | 25 | 7.8 | 11 | 19 | 2 | 40 | 5 | 7.5 | 3.3 | 41 | 39 | | | | |
| | | 0.5 | Clay | | | WS7 | | | | | | | | | | | | | | | | | | | | |
| | | 0.4 | MG | | | WS9 | | | | | | | | | | | | | | | | | | | | |
| | | 0.9 | Clay | | | WS9 | | | | | | | | | | | | | | | | | | | | |

Client/client ref: NPS North West
Project ref: 12-12-16-1-1163
Site ref: Lytham Road Manchester
Data description: Preliminary Site Investigation
Contaminant(s): PAH
Test scenario: Planning
Date: 29 November 2015
User details: C Riley

| | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(ghi)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Critical concentration, $C_c$** | **15000** | **15000** | **74000** | **29** | **5.7** | **7.2** | **640** | **190** | **57** | **0.57** | **3100** | **9900** | **82** | **4900** | **3100** | **7400** | | | | |
| **Notes** | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | | | | |
| **Full dataset size** | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 0 | 0 | 0 | 0 |
| **Outliers present?** | No | Yes | No | No | No | No | No | Yes | No | No | No | No | No | No | No | No | | | | |
| **Number of outliers temporarily excluded** | 0 | | | | | | | | | | | | | | | | | | | |
| **Number removed by filter** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sample size, n** | **10** | **10** | **10** | **10** | **10** | **10** | **10** | **10** | **10** | **10** | **10** | **10** | **10** | **10** | **10** | **10** | **0** | **0** | **0** | **0** |
| **Sample mean, $\bar{x}$** | 4.23 | 1.125 | 6.66 | 22.4 | 19.14 | 22.3 | 8.34 | 11.35 | 18.3 | 2.051 | 38.8 | 3.41 | 8.12 | 2.082 | 31.2 | 36.5 | No Data | No Data | No Data | No Data |
| **Standard deviation, s** | 2.0254218 | 0.5217332 | 2.6629975 | 9.9353466 | 8.6600231 | 8.260347 | 3.5562777 | 7.225149 | 8.2749958 | 0.9934278 | 17.001961 | 1.4548387 | 3.6444173 | 1.0377411 | 13.348325 | 15.671985 | | | | |
| **Number of non-detects** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Set non-detect values to:** | | | | | | | | | | | | | | | | | | | | |
| **Distribution** | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Non-normal | Normal | Normal | Normal | Normal | Normal | Non-normal | Normal | Normal | | | | |
| **Statistical approach** | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Test scenario:** | | | | | Evidence level required: | | 95% | | | | | | | | | | | | | |
| **t statistic, $t_0$ (or $k_0$)** | -23412.7969 | -90909.69347 | -87866.20649 | -2.100684908 | 4.90772499 | 5.780676332 | -561.678382 | -78.19090037 | -14.78914894 | 4.714316419 | -569.3675312 | -21511.50235 | -64.10601517 | -14925.27965 | -727.0123969 | -1485.799768 | | | | |
| **Upper confidence limit** (on true mean concentration, μ) | 5.4040989 | 1.4274389 | 8.2036896 | 28.159334 | 24.160053 | 27.088368 | 10.401507 | 21.309181 | 23.09686 | 2.6268715 | 48.655717 | 4.2533426 | 10.2326 | 3.5124274 | 38.937773 | 45.584755 | | | | |
| **Evidence level** | **100%** | **100%** | **100%** | **97%** | **0%** | **0%** | **100%** | **100%** | **100%** | **0%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | | | | |
| **Base decision on:** | | | | | | | | | | | | | | | | | | | | |
| **Result** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ ≥ Cc** | **μ ≥ Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ ≥ Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | | | | |
| **Select dataset** | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**Back to data** | **Go to outlier test** | **Go to normality test** | **Show individual summary**

| | |
|---|---|
| Client/client ref | NPS North West |
| Project ref | 12-12-16-1-1163 |
| Site ref | Lytham Road Manchester |
| Data description | Preliminary Site Investigation |
| Contaminant(s) | PAH |
| Test scenario | Planning: is true mean lower than critical concentration (μ < Cc)? |
| Date | 29 November 2015 |
| User details | C Riley |

Statistics Calculator (Version 2)

# Input data

This spreadsheet has been produced based on the document 'Guidance on Comparing Soil Contamination Data with a Critical Concentration (CIEH/CL:AIRE, 2008)'. Users of this spreadsheet should always refer to this guidance, the User Manual and to relevant guidance on UK legislation and policy, in order to understand how the procedure should be applied in an appropriate context.

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Go to summary | Project details | Select all filters | Deselect all filters | Paste Values

| Easting | Northing | Depth (m) | User-defined 1 | User-defined 2 | User-defined 3 | Sample ID | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(ghi)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Filter | Filter | Filter | Filter | Filter | Filter | Filter | Filter | Filter | Filter | Filter | Filter | Filter | Filter | Filter | Filter | Filter | Filter | Filter | Filter |
| | | 0.3 | Topsoil | | | TP1 | | | | | | | | | | | | | | | | | | | | |
| | | 0.3 | MG | | | TP2 | < 0.10 | < 0.10 | 0.24 | 0.87 | 0.81 | 1.1 | 0.46 | 0.5 | 0.84 | < 0.10 | 1.8 | < 0.10 | 0.41 | < 0.05 | 1.2 | 1.8 | | | | |
| | | 0.1 | Topsoil | | | TP3 | | | | | | | | | | | | | | | | | | | | |
| | | 0.7 | Clay | | | TP3 | | | | | | | | | | | | | | | | | | | | |
| | | 0.15 | Topsoil | | | TP4 | | | | | | | | | | | | | | | | | | | | |
| | | 1.1 | MG | | | TP5 | 1.1 | < 0.10 | 2.1 | 5.9 | 4.5 | 4.2 | 1.9 | 3.5 | 5.2 | 0.55 | 8.5 | 1.1 | 1.8 | 0.52 | 8.7 | 8.9 | | | | |
| | | 0.2 | Topsoil | | | TP5A | | | | | | | | | | | | | | | | | | | | |
| | | 1.1 | clay | | | TP5A | | | | | | | | | | | | | | | | | | | | |
| | | 0.1 | Topsoil | | | TP8 | | | | | | | | | | | | | | | | | | | | |
| | | 0.4 | MG | | | WS1 | 0.34 | < 0.10 | 0.84 | 4.6 | 3.2 | 4.5 | 1.5 | 2.2 | 3 | 0.4 | 6 | < 0.10 | 1.4 | < 0.05 | 3 | 5.2 | | | | |
| | | 0.7 | Clay | | | WS1 | | | | | | | | | | | | | | | | | | | | |
| | | 0.1 | Topsoil | | | WS4 | | | | | | | | | | | | | | | | | | | | |
| | | 0.2 | Topsoil | | | WS5 | | | | | | | | | | | | | | | | | | | | |
| | | 0.4 | Clay | | | WS5 | | | | | | | | | | | | | | | | | | | | |
| | | 0.2 | Topsoil | | | WS3 | | | | | | | | | | | | | | | | | | | | |
| | | 0.15 | Topsoil | | | WS6 | | | | | | | | | | | | | | | | | | | | |
| | | 0.2 | Topsoil | | | WS7 | | | | | | | | | | | | | | | | | | | | |
| | | 0.5 | Clay | | | WS7 | | | | | | | | | | | | | | | | | | | | |
| | | 0.4 | MG | | | WS9 | 2.2 | 0.4 | 3.9 | 13 | 9.8 | 16 | 5.1 | 5.2 | 9.6 | 1.1 | 23 | 1.4 | 4.9 | 0.8 | 16 | 22 | | | | |
| | | 0.9 | Clay | | | WS9 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |

Client/client ref: NPS North West
Project ref: 12-12-16-1-1163
Site ref: Lytham Road Manchester
Data description: Preliminary Site Investigation
Contaminant(s): PAH
Test scenario: Planning
Date: 29 November 2015
User details: C Riley

| | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(ghi)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Critical concentration, $C_c$** | **15000** | **15000** | **74000** | **29** | **5.7** | **7.2** | **640** | **190** | **57** | **0.57** | **3100** | **9900** | **82** | **4900** | **3100** | **7400** | | | | |
| **Notes** | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | | | | |
| **Full dataset size** | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 0 | 0 | 0 | 0 |
| **Outliers present?** | No | Yes | No | No | No | No | No | No | No | No | No | No | No | No | No | No | | | | |
| **Number of outliers temporarily excluded** | 0 | | | | | | | | | | | | | | | | | | | |
| **Number removed by filter** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sample size, n** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **0** | **0** | **0** | **0** |
| **Sample mean, $\bar{x}$** | 0.9225 | 0.1375 | 1.77 | 6.0925 | 4.5775 | 6.45 | 2.24 | 2.85 | 4.66 | 0.525 | 9.825 | 0.65 | 2.1275 | 0.3425 | 7.225 | 9.475 | No Data | No Data | No Data | No Data |
| **Standard deviation, s** | 0.9598741 | 0.175 | 1.6177763 | 5.0745336 | 3.8022833 | 6.5495547 | 2.0009331 | 1.9908122 | 3.7435812 | 0.4368447 | 9.2081033 | 0.7035624 | 1.9384766 | 0.3840247 | 6.6665208 | 8.8390705 | | | | |
| **Number of non-detects** | **1** | **3** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **2** | 0 | **2** | 0 | 0 | 0 | 0 | 0 | 0 |
| **Set non-detect values to:** | | | | | | | | | | | | | | | | | | | | |
| **Distribution** | Normal | Non-normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | | | | |
| **Statistical approach** | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Test scenario:** | | | | | **Evidence level required:** | | **95%** | | | | | | | | | | | | | |
| **t statistic, $t_0$ (or $k_0$)** | -31252.17595 | -171427 | -91481.4146 | -9.02841586 | -0.590434699 | -0.229023204 | -637.4625868 | -188.0137134 | -27.96252977 | -0.20602285 | -671.1859965 | -28140.64682 | -82.40749312 | -25517.40555 | -927.852797 | -1672.240318 | | | | |
| **Upper confidence limit** (on true mean concentration, μ) | 2.0519663 | 0.5189037 | 3.6736077 | 12.063611 | 9.0515772 | 14.156741 | 4.5944614 | 5.1925524 | 9.0650035 | 1.0390272 | 20.660007 | 1.477869 | 4.40847 | 0.7943749 | 15.069373 | 19.875773 | | | | |
| **Evidence level** | **100%** | **100%** | **100%** | **100%** | **70%** | **58%** | **100%** | **100%** | **100%** | **58%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | | | | |
| **Base decision on:** | | | | | | | | | | | | | | | | | | | | |
| **Result** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ ≈≥ Cc** | **μ ≈≥ Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ ≈≥ Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | | | | |
| **Select dataset** | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**Back to data** | **Go to outlier test** | **Go to normality test** | **Show individual summary**

| | |
|---|---|
| Client/client ref | NPS North West |
| Project ref | 12-12-16-1-1163 |
| Site ref | Lytham Road Manchester |
| Data description | Preliminary Site Investigation |
| Contaminant(s) | PAH |
| Test scenario | Planning: is true mean lower than critical concentration (μ < Cc)? |
| Date | 29 November 2015 |
| User details | C Riley |

Statistics Calculator (Version 2)

# Input data

This spreadsheet has been produced based on the document 'Guidance on Comparing Soil Contamination Data with a Critical Concentration (CIEH/CL:AIRE, 2008)'. Users of this spreadsheet should always refer to this guidance, the User Manual and to relevant guidance on UK legislation and policy, in order to understand how the procedure should be applied in an appropriate context.

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Go to summary | Project details | Select all filters | Deselect all filters | Paste Values

| Easting | Northing | Depth (m) | User-defined 1 | User-defined 2 | User-defined 3 | Sample ID | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(ghi)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.3 | Topsoil | | | TP1 | | | | | | | | | | | | | | | | | | | | |
| | | 0.3 | MG | | | TP2 | | | | | | | | | | | | | | | | | | | | |
| | | 0.1 | Topsoil | | | TP3 | | | | | | | | | | | | | | | | | | | | |
| | | 0.7 | Clay | | | TP3 | < 0.10 | < 0.10 | 0.2 | 0.53 | 0.5 | 0.46 | 0.24 | 0.36 | 0.61 | < 0.10 | 1.3 | < 0.10 | 0.22 | < 0.05 | 1.1 | 1.2 | | | | |
| | | 0.15 | Topsoil | | | TP4 | | | | | | | | | | | | | | | | | | | | |
| | | 1.1 | MG | | | TP5 | | | | | | | | | | | | | | | | | | | | |
| | | 0.2 | Topsoil | | | TP5A | | | | | | | | | | | | | | | | | | | | |
| | | 1.1 | clay | | | TP5A | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.05 | < 0.10 | < 0.05 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.05 | < 0.10 | < 0.10 | | | | |
| | | 0.1 | Topsoil | | | TP8 | | | | | | | | | | | | | | | | | | | | |
| | | 0.4 | MG | | | WS1 | | | | | | | | | | | | | | | | | | | | |
| | | 0.7 | Clay | | | WS1 | < 0.10 | < 0.10 | 0.19 | 0.61 | 0.48 | 0.46 | < 0.05 | 0.36 | 0.49 | < 0.10 | 1 | < 0.10 | < 0.10 | < 0.05 | 0.86 | 1.1 | | | | |
| | | 0.1 | Topsoil | | | WS4 | | | | | | | | | | | | | | | | | | | | |
| | | 0.2 | Topsoil | | | WS5 | | | | | | | | | | | | | | | | | | | | |
| | | 0.4 | Clay | | | WS5 | < 0.10 | < 0.10 | < 0.10 | 0.29 | 0.25 | < 0.10 | < 0.05 | < 0.10 | 0.26 | < 0.10 | 0.53 | < 0.10 | < 0.10 | < 0.05 | 0.44 | 0.55 | | | | |
| | | 0.2 | Topsoil | | | WS3 | | | | | | | | | | | | | | | | | | | | |
| | | 0.15 | Topsoil | | | WS6 | | | | | | | | | | | | | | | | | | | | |
| | | 0.2 | Topsoil | | | WS7 | | | | | | | | | | | | | | | | | | | | |
| | | 0.5 | Clay | | | WS7 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.05 | < 0.10 | < 0.05 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.05 | < 0.10 | < 0.10 | | | | |
| | | 0.4 | MG | | | WS9 | | | | | | | | | | | | | | | | | | | | |
| | | 0.9 | Clay | | | WS9 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.05 | < 0.10 | < 0.05 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.05 | < 0.10 | < 0.10 | | | | |

Client/client ref: NPS North West
Project ref: 12-12-16-1-1163
Site ref: Lytham Road Manchester
Data description: Preliminary Site Investigation
Contaminant(s): PAH
Test scenario: Planning
Date: 29 November 2015
User details: C Riley

| | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(ghi)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Critical concentration, $C_c$** | **15000** | **15000** | **74000** | **29** | **5.7** | **7.2** | **640** | **190** | **57** | **0.57** | **3100** | **9900** | **82** | **4900** | **3100** | **7400** | | | | |
| **Notes** | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | LQM 2.5% SOM POS resi | | | | |
| **Full dataset size** | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 0 | 0 | 0 | 0 |
| **Outliers present?** | No | No | No | No | No | No | Yes | No | No | No | No | No | Yes | No | No | No | | | | |
| **Number of outliers temporarily excluded** | 0 | | | | | | | | | | | | | | | | | | | |
| **Number removed by filter** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sample size, n** | **6** | **6** | **6** | **6** | **6** | **6** | **6** | **6** | **6** | **6** | **6** | **6** | **6** | **6** | **6** | **6** | **0** | **0** | **0** | **0** |
| **Sample mean, $\bar{x}$** | 0.05 | 0.05 | 0.0983333 | 0.2633333 | 0.23 | 0.1866667 | 0.0608333 | 0.1533333 | 0.2391667 | 0.05 | 0.4966667 | 0.05 | 0.0783333 | 0.025 | 0.425 | 0.5 | No Data | No Data | No Data | No Data |
| **Standard deviation, s** | 7.601E-18 | 7.601E-18 | 0.0749444 | 0.2563331 | 0.2158703 | 0.2117231 | 0.0877734 | 0.1600833 | 0.260181 | 7.601E-18 | 0.5474182 | 7.601E-18 | 0.0694022 | 3.801E-18 | 0.4619416 | 0.5403702 | | | | |
| **Number of non-detects** | **6** | **6** | **4** | **3** | **3** | **4** | **5** | **4** | **3** | **6** | **3** | **6** | **5** | **6** | **3** | **3** | 0 | 0 | 0 | 0 |
| **Set non-detect values to:** | | | | | | | | | | | | | | | | | | | | |
| **Distribution** | Non-normal | Non-normal | Non-normal | Normal | Non-normal | Non-normal | Non-normal | Non-normal | Normal | Non-normal | Normal | Non-normal | Non-normal | Non-normal | Normal | Normal | | | | |
| **Statistical approach** | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Test scenario:** | | | | | **Evidence level required:** | | **95%** | | | | | | | | | | | | | |
| **t statistic, $t_0$ (or $k_0$)** | -4.83375E+21 | -4.83375E+21 | -2418618.902 | -274.6042773 | -62.06832038 | -81.13941704 | -17858.76744 | -2904.909062 | -534.3782396 | -1.67571E+17 | -13869.1075 | -3.19027E+21 | -2891.352941 | -3.15805E+21 | -16435.79603 | -33541.81614 | | | | |
| **Upper confidence limit** (on true mean concentration, μ) | 0.05 | 0.05 | 0.2316979 | 0.4742032 | 0.6141441 | 0.5634307 | 0.2170272 | 0.4382037 | 0.453202 | 0.05 | 0.9469948 | 0.05 | 0.2018355 | 0.025 | 0.8050116 | 0.9445302 | | | | |
| **Evidence level** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | | | | |
| **Base decision on:** | | | | | | | | | | | | | | | | | | | | |
| **Result** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | **μ < Cc** | | | | |
| **Select dataset** | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**Back to data** | **Go to outlier test** | **Go to normality test** | **Show individual summary**

| | |
|---|---|
| Client/client ref | NPS North West |
| Project ref | 12-12-16-1-1163 |
| Site ref | Lytham Road Manchester |
| Data description | Preliminary Site Investigation |
| Contaminant(s) | TPH |
| Test scenario | Planning: is true mean lower than critical concentration (μ < Cc)? |
| Date | 29 November 2015 |
| User details | C Riley |

Statistics Calculator (Version 2)

# Input data

This spreadsheet has been produced based on the document 'Guidance on Comparing Soil Contamination Data with a Critical Concentration (CIEH/CL:AIRE, 2008)'. Users of this spreadsheet should always refer to this guidance, the User Manual and to relevant guidance on UK legislation and policy, in order to understand how the procedure should be applied in an appropriate context.

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Go to summary | Project details | Select all filters | Deselect all filters | Paste Values

| Easting | Northing | Depth (m) | User-defined 1 | User-defined 2 | User-defined 3 | Sample ID | TPH Aliphatic >EC5 - EC6 | TPH Aliphatic >EC6 - EC8 | TPH Aliphatic >EC8 - EC10 | TPH Aliphatic >EC10 - EC12 | TPH Aliphatic >EC12 - EC16 | TPH Aliphatic >EC16 - EC35 | TPH Aliphatic > EC35 - EC44 | | TPH Aromatic >EC5 - EC7 | TPH Aromatic >EC7 - EC8 | TPH Aromatic >EC8 - EC10 | TPH Aromatic >EC10 - EC12 | TPH Aromatic >EC12 - EC16 | TPH Aromatic >EC16 - EC21 | TPH Aromatic >EC21 - EC35 | TPH Aromatic > EC35 - EC44 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.3 | | | | TP1 | < 0.1 | < 0.1 | < 0.1 | < 1.0 | 4.8 | 16 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | 3.4 | 54 | 260 | 350 | < 8.4 | | | | |
| | | 0.3 | | | | TP2 | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | <8 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | < 10 | < 10 | < 8.4 | | | | |
| | | 0.1 | | | | TP3 | < 0.1 | < 0.1 | < 0.1 | < 1.0 | 4.1 | 27.9 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | 5.2 | 100 | 400 | 780 | 25 | | | | |
| | | 0.7 | | | | TP3 | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | <8.0 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | < 1.0 | 2.9 | 15 | < 10 | < 8.4 | | | | |
| | | 0.15 | | | | TP4 | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | 21.7 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | 2.7 | 61 | 400 | 570 | 25 | | | | |
| | | 1.1 | | | | TP5 | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | 11 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | < 1.0 | 17 | 110 | 240 | 14 | | | | |
| | | 0.2 | | | | TP5A | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | 25 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | 3.5 | 61 | 390 | 630 | 28 | | | | |
| | | 1.1 | | | | TP5A | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | <8.0 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | < 10 | < 10 | < 8.4 | | | | |
| | | 0.1 | | | | TP8 | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | <8.0 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | < 1.0 | 20 | 140 | 190 | < 8.4 | | | | |
| | | 0.4 | | | | WS1 | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | <8.0 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | 17 | 24 | < 8.4 | | | | |
| | | 0.7 | | | | WS1 | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | <8.0 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | < 10 | < 10 | < 8.4 | | | | |
| | | 0.1 | | | | WS4 | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | 12 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | < 1.0 | 21 | 120 | 180 | < 8.4 | | | | |
| | | 0.2 | | | | WS5 | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | 8.8 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | 1.7 | 31 | 190 | 260 | 9.9 | | | | |
| | | 0.4 | | | | WS5 | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | <8.0 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | < 10 | < 10 | < 8.4 | | | | |
| | | 0.2 | | | | WS3 | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | 12 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | 1.2 | 21 | 120 | 200 | 9.7 | | | | |
| | | 0.15 | | | | WS6 | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | 14 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | 3.2 | 31 | 190 | 250 | < 8.4 | | | | |
| | | 0.2 | | | | WS7 | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | 8.5 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | 3 | 40 | 200 | 270 | < 8.4 | | | | |
| | | 0.5 | | | | WS7 | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | <8.0 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | < 10 | < 10 | < 8.4 | | | | |
| | | 0.4 | | | | WS9 | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | <8.0 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | < 1.0 | 12 | 100 | 180 | < 8.4 | | | | |
| | | 0.9 | | | | WS9 | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | <8.0 | < 8.4 | | < 0.1 | < 0.1 | < 0.1 | < 1.0 | < 2.0 | < 10 | < 10 | < 8.4 | | | | |

Client/client ref: NPS North West
Project ref: 12-12-16-1-1163
Site ref: Lytham Road Manchester
Data description: Preliminary Site Investigation
Contaminant(s): TPH
Test scenario: Planning
Date: 29 November 2015
User details: C Riley

| | TPH Aliphatic >EC5 - EC6 | TPH Aliphatic >EC6 - EC8 | TPH Aliphatic >EC8 - EC10 | TPH Aliphatic >EC10 - EC12 | TPH Aliphatic >EC12 - EC16 | TPH Aliphatic >EC16 - EC35 | TPH Aliphatic > EC35 - EC44 | | TPH Aromatic >EC5 - EC7 | TPH Aromatic >EC7 - EC8 | TPH Aromatic >EC8 - EC10 | TPH Aromatic >EC10 - EC12 | TPH Aromatic >EC12 - EC16 | TPH Aromatic >EC16 - EC21 | TPH Aromatic >EC21 - EC35 | TPH Aromatic > EC35 - EC44 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Critical concentration, $C_c$** | **590000** | **610000** | **13000** | **13000** | **13000** | **250000** | **250000** | | **56000** | **56000** | **5000** | **5000** | **5100** | **3800** | **3800** | **3800** | | | | |
| **Notes** | LQM 2.5%SOM POS Resi | LQM 2.5%SOM POS Resi | LQM 2.5%SOM POS Resi | LQM 2.5%SOM POS Resi | LQM 2.5%SOM POS Resi | LQM 2.5%SOM POS Resi | LQM 2.5%SOM POS Resi | | LQM 2.5%SOM POS Resi | LQM 2.5%SOM POS Resi | LQM 2.5%SOM POS Resi | LQM 2.5%SOM POS Resi | LQM 2.5%SOM POS Resi | LQM 2.5%SOM POS Resi | LQM 2.5%SOM POS Resi | LQM 2.5%SOM POS Resi | | | | |
| **Full dataset size** | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 0 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 0 | 0 | 0 | 0 |
| **Outliers present?** | No | No | No | No | Yes | No | No | | No | No | No | No | Yes | No | No | No | | | | |
| **Number of outliers temporarily excluded** | 0 | | | | | | | | | | | | | | | | | | | |
| **Number removed by filter** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sample size, n** | **20** | **20** | **20** | **20** | **20** | **20** | **20** | **0** | **20** | **20** | **20** | **20** | **20** | **20** | **20** | **20** | **0** | **0** | **0** | **0** |
| **Sample mean, $\bar{x}$** | 0.05 | 0.05 | 0.05 | 0.5 | 1.345 | 9.845 | 4.2 | No Data | 0.05 | 0.05 | 0.05 | 1.495 | 23.945 | 134.1 | 207.95 | 8.52 | No Data | No Data | No Data | No Data |
| **Standard deviation, s** | 7.119E-18 | 7.119E-18 | 7.119E-18 | 0 | 1.0679419 | 7.6313395 | 9.113E-16 | | 7.119E-18 | 7.119E-18 | 7.119E-18 | 1.4511248 | 27.28326 | 138.29941 | 228.2758 | 8.0041174 | | | | |
| **Number of non-detects** | **20** | **20** | **20** | **20** | **18** | **10** | **20** | 0 | **20** | **20** | **20** | **12** | **7** | **6** | **7** | **14** | 0 | 0 | 0 | 0 |
| **Set non-detect values to:** | | | | | | | | | | | | | | | | | | | | |
| **Distribution** | Non-normal | Non-normal | Non-normal | Single value | Non-normal | Non-normal | Non-normal | | Non-normal | Non-normal | Non-normal | Non-normal | Non-normal | Non-normal | Non-normal | Non-normal | | | | |
| **Statistical approach** | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Test scenario:** | | | | | Evidence level required: | | 95% | | | | | | | | | | | | | |
| **t statistic, $t_0$ (or $k_0$)** | -3.70628E+23 | -3.83192E+23 | -8.16635E+21 | N/A | -54433.43864 | -146499.8333 | -1.2269E+21 | | -3.51782E+22 | -3.51782E+22 | -3.14089E+21 | -15404.59792 | -832.0416209 | -118.5428297 | -70.37161264 | -2118.411471 | | | | |
| **Upper confidence limit** (on true mean concentration, μ) | 0.05 | 0.05 | 0.05 | 0.5 | 2.3859011 | 17.28311 | 4.2 | | 0.05 | 0.05 | 0.05 | 2.9093815 | 50.537433 | 268.89759 | 430.44572 | 16.321449 | | | | |
| **Evidence level** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | | | | |
| **Base decision on:** | | | | | | | | | | | | | | | | | | | | |
| **Result** | μ < Cc | μ < Cc | μ < Cc | μ < Cc | μ < Cc | μ < Cc | μ < Cc | | μ < Cc | μ < Cc | μ < Cc | μ < Cc | μ < Cc | μ < Cc | μ < Cc | μ < Cc | | | | |
| **Select dataset** | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**Back to data** | **Go to outlier test** | **Go to normality test** | **Show individual summary**

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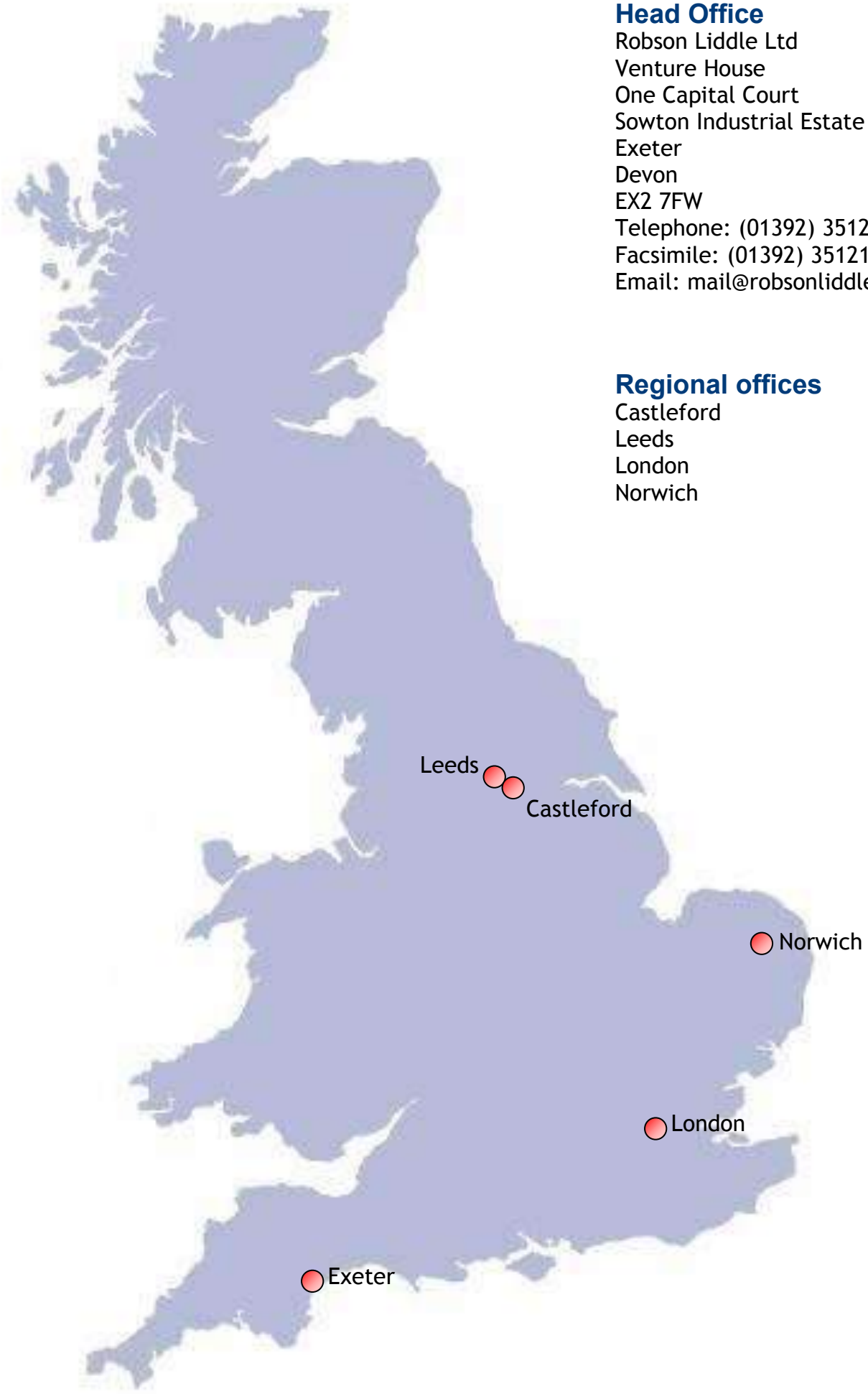

# APPENDIX E LEGISLATIVE CONTEXT AND GROUND CONTAMINATION ASSESSMENT METHODOLOGIES

RAMBOLL ENVIRON

Intended for

Project no.
**00000**

Date
**10 August 2015**

# LEGISLATIVE CONTEXT AND METHODOLOGIES

# GROUND CONTAMINATION

# 1. LEGISLATIVE CONTEXT

Environmental risks are assessed in accordance with Contaminated Land (England) (Amendment) Regulations 2012, Part IIA of the Environmental Protection Act 1990, and Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance, DEFRA 2012. Part IIA provides a statutory definition of contaminated land. To fall within this definition it is necessary that, as a result of the condition of the land, substances may be present on or under the land such that:

(a) Significant harm is being caused or there is a significant possibility of such harm being caused; or

(b) Significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused.

Risk from contamination is assessed by consideration of possible linkages between contaminant sources and potential receptors which could be harmed or polluted and the potential pathways between them. For a risk of pollution or environmental harm to occur as a result of ground contamination, all of the following elements must be present:

- A source - a substance that is capable of causing pollution or harm;
- A receptor - something which could be adversely affected by the contaminant; and
- A pathway - a route by which the contaminant can reach the receptor.

If one of these elements is absent there can be no significant risk. If all are present then the magnitude of the risk is a function of the magnitude and mobility of the source, the sensitivity of the receptor and the nature of the migration pathway.

The Environment Agency Contaminated Land Report CLR 11 Model Procedures for the Management of Land Contamination provides the technical framework for structured decision making about land contamination. CLR 11 advocates a phased approach to risk assessment comprising:

- Preliminary Risk Assessment (PRA) – desk study and qualitative assessment
- Generic Quantitative Risk Assessment (GQRA) – assessment of contaminant concentrations against generic assessment criteria.
- Detailed Quantitative Risk Assessment (DQRA) – detailed site specific risk assessment and development of site-specific assessment criteria.

Each of these phases follows the same basic steps buts adds site specific details and further certainty into the assessment as the stages progress. The basic steps are:

- Hazard identification and hazard assessment – development or refinement of the source-pathway-receptor conceptual model, and identification of potential pollutant linkages.
- Risk Estimation – qualitative risk estimation predicting magnitude and probability of potential consequences that may arise as a result of a hazard.
- Risk Evaluation – deciding whether a risk is unacceptable.

## 2. RISK ESTIMATION

An assessment of environmental risks is made for each potential pollutant linkage identified.

Risk estimation has been completed in accordance with the guidance provided in:

- NHBC and Environment Agency 2008. Guidance for the Safe Development of Housing on Land Affected by Contamination. R&D Publication 66: 2008.

The following is taken directly from NHBC/EA 2008. The key to the classification is that the designation of risk is based upon the consideration of both:

a) the magnitude of the potential consequence (*i.e.*, severity) [takes into account both the potential severity of the hazard and the sensitivity of the receptor];

b) the magnitude of probability (*i.e.*, likelihood) [takes into account both the presence of the hazard and receptor and the integrity of the pathway].

**Table 1: Classification of Consequence (after NHBC/EA 2008)**

| Category | Definition |
|---|---|
| Severe | Highly elevated concentrations **likely** to result in "significant harm" to human health as defined by the EPA 1990, Part 2A, if exposure occurs.<br><br>Equivalent to EA **Category 1** pollution incident including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce.<br><br>Major damage to aquatic or other ecosystems, which is likely to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long-term maintenance of the population.<br><br>Catastrophic damage to crops, buildings or property. |
| Medium | Elevated concentrations which could result in "significant harm" to human health as defined by the EPA 1990, Part 2A if exposure occurs.<br><br>Equivalent to **EA Category 2** pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce.<br><br>Significant damage to aquatic or other ecosystems, which may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long-term maintenance of the population.<br><br>Significant damage to crops, buildings or property. |
| Mild | Exposure to human health **unlikely** to lead to "significant harm".<br><br>Equivalent to **EA Category 3** pollution incident including minimal or short lived effect on water quality; marginal effect on amenity value, agriculture or commerce.<br><br>Minor or short lived damage to aquatic or other ecosystems, which is unlikely to result in a substantial adverse change in its functioning or harm to a species of special interest that would endanger the long-term maintenance of the population.<br><br>Minor damage to crops, buildings or property. |
| Minor | No measurable effect on humans.<br><br>Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems.<br><br>Repairable effects of damage to buildings, structures and services. |

* For these purposes, disease is to be taken to mean an unhealthy condition of the body or a part of it and can include, for example, cancer, liver dysfunction or extensive skin ailments. Mental dysfunction is included only insofar as it is attributable to the effects of a pollutant on the body of the person concerned.

The likelihood of an event (probability) takes into account both the presence of the hazard and target and the integrity of the pathway and has been assessed based on the categories given below.

**Table 2: Classification of Probability (after NHBC/EA 2008)**

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

The potential severity of the risk and the probability of the risk occurring have been combined in accordance with the following matrix in order to give a level of risk for each potential hazard.

**Table 3: The Classification of Risk (after NHBC/EA 2008)**

| | | Consequence | | | |
|---|---|---|---|---|---|
| | | **Severe** | **Medium** | **Mild** | **Minor** |
| **Probability** | **High Likelihood** | **Very high** | High | Moderate | Low |
| | **Likely** | High | Moderate | Moderate/ Low | Low |
| | **Low Likelihood** | Moderate | Moderate/ Low | Low | Very low |
| | **Unlikely** | Moderate/ Low | Low | Very low | Very low |

**Very high risk**

There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the site without remediation action OR there is evidence that severe harm to a designated receptor is already occurring. Realisation of that risk is likely to present a substantial liability to be site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in the short-term.

**High risk**

Harm is likely to arise to a designated receptor from an identified hazard at the site without remediation action. Realisation of the risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency to clarify the risk. Remediation works may be necessary in the short-term and are likely over the longer term.

**Moderate risk**

It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely, that the harm would be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to site owner/occupier. Some remediation works may be required in the longer term.

**Low risk**

It is possible that harm could arise to a designated receptor from identified hazard, but it is likely at worst, that this harm if realised would normally be mild. It is unlikely that the site owner/or occupier would face substantial liabilities from such a risk. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited.

**Very low risk**

It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.

**No potential risk**

There is no potential risk if no pollution linkage has been established.

# 3. GQRA METHODOLOGIES

In order to assess the significance of the chemical concentrations recorded, generic assessment criteria (GAC) must be selected. The GAC are screening concentrations which are used initially for direct comparison to the measured site concentrations.

The GAC are defined based on the critical receptors identified at the site. Receptors are considered in relation to:

- Human health receptors (*e.g.*, site users);
- The water environment (*e.g.*, groundwater and surface water).

Potential risks to human health are considered primarily using measured concentrations of chemicals in soil. Potential risks to the water environment are considered primarily using soil leachate and groundwater concentrations as indicative of the potentially mobile fraction of any soil impact.

Additional receptors may be relevant dependent on the site *e.g.*, flora/fauna, water supply pipes, buried concrete.

## 3.1. Human Health Assessment

### 3.1.1. Initial Screening Assessment

The GAC adopted for assessment of soils in relation to Human Health follow the hierarchy listed below:

- C4SLs (Category 4 Screening Levels) published by DEFRA 2014. The C4SL guidance is an update on previous DEFRA guidance with the main changes being a few alterations to human health exposure assumptions and use of 'low' risk toxicological inputs instead of the previously used 'minimal' risk inputs. C4SLs have only been generated for 6 compounds typically only at a soil organic matter content of 6%. Other guidance is therefore required.
- LQM/CIEH, 2014 S4ULs (Suitable for Use Levels). These are an update on the previous LQM/CIEH 2009 guidance, and keep the existing 'minimal' risk toxicological values alongside the DEFRA 2014 updated exposure parameters.
- EIC/AGS/CL:AIRE Dec 2009. The Soil Generic Assessment Criteria for Human Health Risk Assessment.
- Ramboll in-house screening criteria (derived in accordance with the published CLEA framework) are used if no published guideline value is available.

Soil Guideline Values (EA/DEFRA, 2009) may also be referred to if relevant.

Contaminant concentrations below the adopted GAC are not considered to present a significant risk to identified receptors and therefore are not considered to warrant further study. Contaminants which are recorded at concentrations above their respective GAC are considered to present a potential risk to identified receptors and resultantly these determinants are subject to further assessment.

### 3.1.2. Contaminant Distribution Assessment

Concentrations above the GAC are considered further in relation to vertical and lateral distribution across the site and through statistical analysis, where appropriate. This analysis is used to define 'averaging areas' within which contamination concentrations and distribution are considered likely to be similar.

For each averaging area, where appropriate, statistical analysis is then used to calculate a 'representative' concentration for each contaminant within that area and identify

possible outliers of the underlying distribution of contaminant concentrations. This analysis is completed in accordance with CIEH 2008 guidance.

The initial statistical tests are used to calculate the 95% probability that the true population mean falls below the critical concentration (GAC). In practise, this involves comparing the 95th Upper Confidence Limit of the true population mean with the GAC. The Maximum Value test is then used to identify whether the maximum concentration is likely to lie outside of the assumed distribution trend and as such would represent an outlier of the general population of data across the site. Outliers above the GAC may represent localised contaminant hotspots and require further consideration.

Constituent non-detects are conservatively assigned a value equal to the reported analytical laboratory limit of detection. Any identified true outliers are excluded from the datasets used in calculation of the 95%UCL value.

### 3.2. Assessment for the Water Environment

Assessment of risks to water resources is completed in general accordance with guidance provided in the Environment Agency 2013, Groundwater Protection Principles and Practice (GP3).

Generic assessment criteria for waters must be selected to assess potential risks to the identified environmental receptors. There are numerous UK and European guidelines for waters based on the site situation and different receptors.

For the majority of site situations, it is considered that use of UK drinking water standards (for non-hazardous substances) and minimum reporting values (for hazardous substances) will be most appropriate for assessment of risks to groundwater resources; and use of environmental quality standards for freshwater or marine waters will be most appropriate for assessment of risks to the surface water environment.

Water and leachate data may also be compared to e.g. bathing water standards etc. where this pollutant linkage may be present.

All water quality standards are sourced from the EA Chemical Standards Database online resource where possible.

## 4. GROUND GAS RISK ASSESSMENT

Ground gas risk is characterised using guidance provided in the following:

- CIRIA C665, 2007. Assessing risks posed by hazardous ground gases to buildings. (Supersedes CIRIA 659).
- NHBC / RSK, 2007. Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present. Report Ed 4.
- BS8485: 2015. Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings.
- BS8576:2013. Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)

The risk posed by a gas regime is assessed initially by calculating a Gas Screening Value using a combination of the gas flow rate and recorded concentrations of carbon dioxide and methane. This Gas Screening Value is then used in combination with the maximum recorded gas concentrations to determine the site's Characteristic Situation (CIRIA 665 – all site uses except low rise residential) or Traffic Light Classification (NHBC/RSK 2007 low rise residential sites only). Table A below outlines the method for defining the Characteristic Situation as detailed in CIRIA 665 and Table B outlines the method for defining the Traffic Light classification as detailed in NHBC/RSK 2007.

**Table A: Proposed method for classifying gassing sites (after CIRIA C665 2007)**

| Characteristic Situation | Risk classification | Gas screening value of $CH_4$ or $CO_2$ (l/hr)[a] | Additional limiting factors | Typical source of generation |
|---|---|---|---|---|
| 1 | Very low risk | <0.07 | Typically methane ≤ 1% and/or carbon dioxide ≤ 5%. Otherwise consider increase to Situation 2 | Natural soils with low organic content. "Typical" Made Ground |
| 2 | Low risk | <0.7 | Borehole air flow rate not to exceed 70l/hr. Otherwise consider increase to Characteristic Situation 3 | Natural soil, high peat/organic content. "Typical" Made Ground |
| 3 | Moderate risk | <3.5 | - | Old landfill, inert waste, mineworking flooded |
| 4 | Moderate to high risk | <15 | Quantitative risk assessment required to evaluate scope of protective measures | Mineworking -susceptible to flooding, completed landfill, inert waste (WMP 26B criteria) |
| 5 | High risk | <70 | - | Mineworking unflooded inactive with shallow workings near surface |
| 6 | Very high risk | >70 | - | Recent landfill site |

[a] Gas screening value = gas concentration (%) x measured borehole flow rate (l/hr)

**Table B: Proposed method for classifying gassing sites (after NHBC/RSK 2007)**

| Traffic Light | Methane1 | | Carbon Dioxide1 | |
|---|---|---|---|---|
| | Typical Maximum Concentration5 (%v/v) | Gas Screening Value (GSV)2,4,6 litres per hour | Typical Maximum Concentration5 | Gas Screening Value (GSV)2,3,4,5 |

| | | | (%v/v) | litres per hour |
|---|---|---|---|---|
| Green | | | | |
| Amber 1 | 1 | 0.16 | 5 | 0.78 |
| Amber 2 | 5 | 0.63 | 10 | 1.56 |
| Red | 20 | 1.56 | 30 | 3.13 |
| | | | | |

The CIRIA, NHBC and BS8485 guidance documents are then used to determine requirements for gas protection measures based on the site classification.

## 5. WATER SUPPLY PIPES

The assessment has been completed in accordance with the current UK guidance:

- Water UK. Jan 2014. Contaminated Land Assessment Guidance.
- UKWIR UK Water Industry Research Ltd, 2010. Guidance for Selection of Water Supply Pipes to be used in Brownfield Sites.

This guidance provides threshold concentrations for different pipe material for various chemical groups.

The pipeline materials considered by the guidance are PE, PVC, wrapped steel, wrapped ductile iron or copper pipe and barrier pipe. PE and PVC are assessed using threshold concentrations for various chemical groups including volatile organic compounds (VOC) with tentatively identified compounds (TICs), semi-volatile organic compounds (SVOC) with TICs, and mineral oils. Wrapped steel, wrapped ductile iron and copper pipe are assessed using corrosive properties.

Regional water companies may have adopted additional more stringent thresholds which they apply locally, thus consultation with the water authority must always be completed prior to final determination of water supply pipe materials.

# 6. WASTE CLASSIFICATION

The main steps in classifying waste are:

1. Is it really a waste or can it be reused, recycled or recovered?
2. If the material is not to be utilised in some way and it is waste then classify to ascertain if hazardous or non-hazardous. In order to do this, guidance regarding the definition and classification of hazardous waste is utilised, the two main documents being EA, 2015 'Technical Guidance WM3: Waste Classification - Guidance on the classification and assessment of waste' and the European Waste Catalogue (EWC 2002).
3. Use the results of this initial waste classification to follow one of the following routes:

<table>
<tr><th colspan="3">Hazardous</th><th colspan="2">Non-Hazardous</th><th></th></tr>
<tr><td colspan="3">Pre-treat the waste.</td><td colspan="2">Thought likely to be inert:<br>(e.g. insoluble and inorganic in nature)</td><td>Thought unlikely to be inert:<br>(e.g. may contain peat or other high organic content material)</td></tr>
<tr><td colspan="3">Complete WAC (Waste Acceptance Criteria) testing to determine class of landfill it can go to or any requirement for further pre-treatment if WAC fails.</td><td colspan="2">Complete WAC test to determine class of landfill it can be disposed to</td><td>-</td></tr>
<tr><td>Pass stable non-reactive hazardous WAC: dispose of at SNRHW landfill.</td><td>Pass hazardous WAC: dispose of at hazardous landfill.</td><td>Fail: further remedial action required</td><td>Pass: dispose of at inert landfill</td><td>Fail: dispose of at non-hazardous landfill</td><td>Dispose to non-hazardous landfill (no WAC testing required by WM3).</td></tr>
</table>

The landfill regulations (Environment Agency, 2011 Treatment of Waste for Landfill) prescribe that hazardous waste requires pre-treatment prior to disposal to landfill. This may include physical sorting at the point of production on site, by sorting of waste soils into separate stockpiles of eg topsoil, made ground and natural gravels.

## 6.1. Methodology

In terms of the EWC, the soil to be excavated from this site for disposal is classed as 'Soil and Stones containing Dangerous Substances' (EWC Code 170503) or 'Soil and Stones other than those mentioned in EWC Code 170503' (EWC Code 170504). As such it is what is known as a 'Mirror Entry waste' and needs to be assessed against Threshold Levels for certain dangerous substances in order to confirm whether it needs to be classified as hazardous (170503) or non-hazardous (170504).

Data from site soil chemical testing have been assessed to classify the site soils. The assessment has been undertaken using HazWasteOnline ™, a web-based tool for classifying waste. The software utilises Environment Agency guidance and European regulations to classify samples in line with current requirements.

The assessment provided in this report fulfils the requirement of step 2 above, and allows classification of the site soils and hazardous or non-hazardous.

Asbestos: The Hazardous Waste (England and Wales) Regulations 2005 requires that any waste having an asbestos content greater than 0.1% weight/weight (w/w) be classified as Hazardous Waste. Any waste with an asbestos content of less than 0.1% w/w can be classified as non-hazardous waste, unless there are other contaminants present which would make the waste hazardous.

Where fibrous asbestos is present at concentrations greater than 0.001%, these can be considered to pose a risk to human health and must be dealt with as hazardous soils for disposal purposes.

Where the asbestos is deemed to be of a fibrous nature the Health and Safety Executive (HSE) require that the handling of the material is undertaken by a suitably licensed company. The Carriage of Dangerous Goods (etc.) Regulations 2009 (CDG2009) applies in this instance.