Environmental Geotechnical Highways Structural Civil

# Build Phase 3, Space Studios, Gorton

## Combined Updated Phase 1 and Phase 2 Geo-Environmental Ground Investigation

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Ref: 3534-01
Job: 3534
Rev: A
By: AJ

Date: Jan 2022

# REVISIONS

| Revision | Date | Prepared By | Authorised By | Remarks |
|---|---|---|---|---|
| First Issue | 28th July 2021 | Angharad Jones | Andrew Edwards | - |
| Revision A | 11th January 2022 | Andrew Edwards | Andrew Edwards | Cover System thickness adjusted to 600mm as per Manchester City Council Requirements – Section 5.2.4. |
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# 1.0 INTRODUCTION

This *Combined Updated Phase 1 and Phase 2 Geo-Environmental Ground Investigation* report has been prepared at the request Manchester City Council. Instructions to proceed with this investigation and report were received in June 2021.

It should be noted that a Phase 1 Geo-Environmental Report (Desk Study) was previously produced by Integra Consulting Ltd for the wider Space Studios Site in 2015 (Report ref: 2913). As this report pertains to *Build Phase 3* of the Space Studios Project only the relevant information from the previous desk study has been summarised within Section 2.0 of this report.

Since the previous site-wide desk study was undertaken in 2015, a Phase 2 Geo-Environmental investigation was also undertaken (pre-demolition) as well as demolition of the former on-site buildings and significant enabling works. This information has also been summarised within Section 2.0 and updated to include post 2015 information, with updated conceptual models taking into account the previous work included in Section 5.0.

The previous Integra Consulting Phase 1 and Phase 2 Geo-Environmental Reports referenced within this report and are contained in Appendix 11 and 12 respectively.

This report pertains to Build Phase 3 of the wider Space Studios site. The site is a c. 1.4 Ha site located in the south western section of the wider Space Studios Site, c. 3.1km south east of Manchester City Centre at the approximate postcode M12 5FQ. The National Ordnance Survey Grid Reference for the centre of the site is 386805E, 296910N.

The site is currently a vacant area of compacted stone materials land following the demolition of the Wenlock Tower and other former buildings. There is a section of land along the northern boundary which is an enclosed area of soft landscaping.

An updated Phase 1 and Phase 2 geo-environmental ground investigation was undertaken at the site as it is the Client's intention to develop the site into commercial buildings associated with the wider Space Project studios.

A site location plan is contained in Appendix 2 and a proposed development plan is contained within Appendix 3.

The limitations of this report are contained in Appendix 1.

## 1.1 Brief

The brief was to carry out an updated phase 1 and intrusive phase 2 geo-environmental ground investigation for the site based upon the proposed development outlined in Section 1.0. The investigation was to include the following tasks:

a) Undertake / install appropriate exploratory holes and collect representative samples from exploratory holes and arrange appropriate chemical testing in accordance with the latest legal framework, record olfactory and / or visual evidence of contamination during intrusive works and undertake on site in-situ and laboratory geotechnical testing.

b) Update the conceptual site models with post-demolition information.

c) Identify the risks and evaluate whether a Phase 3 numerical risk assessment and / or a Remedial Strategy, if required.

d) Undertake an assessment of the ground conditions findings to an allowable bearing capacity for the underlying soils.

A report was to be provided to summarise the findings of this investigation.

## 1.2 Third Parties

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## 2.0 DESK STUDY

### 2.1 Introduction

Integra Consulting previously undertook a full Phase 1 Geo-Environmental Desk Study Report for the wider Space Studios site in October 2015 (report ref: 2913) as well as a Phase 2 Geo-Environmental Investigation in 2017 (report ref: 2913-05 Rev A). Since the previous works were undertaken significant changes have occurred within Build Phase 3 associated with the demolition of the former buildings and subsequent enabling works.

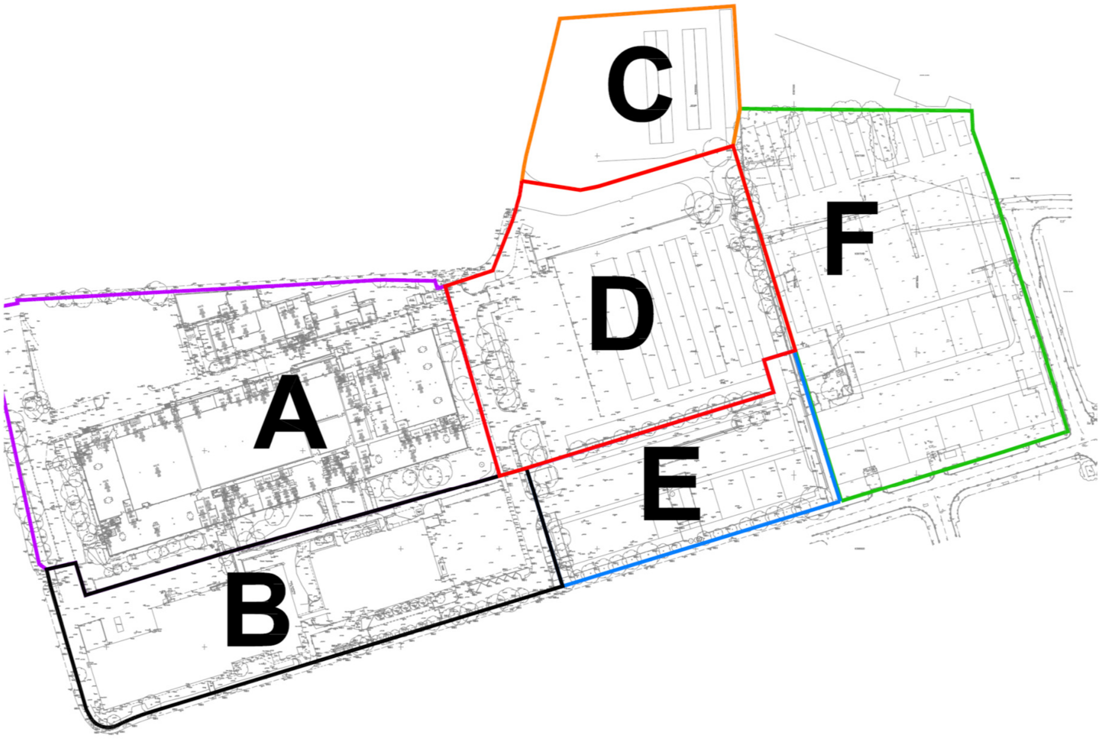


*Figure 1; Extract of the wider Space Studios Site, letters A - F correspond to areas referred to within this report.*

***Phase 3 is Area B (The Site)***

Consequently, the key information from the previous Integra Consulting desk study and intrusive investigation relating to Build Phase 3 has been summarised below, as well as the demolition and enabling works strategy, with updated conceptual site models included in Section 5.0

## 2.2 Previous Site Investigation Woks

### 2.2.1 Integra Consulting Desk Study 2015

The Integra Consulting Phase 1 Geo-Environmental Ground Investigation Report (Ref: 2913, Dated October 2015) was undertaken on the wider Space Studios site and given the varying nature of the site uses and numerous buildings at the time of writing the site was sub-divided into 6 No. sections within the report, as follows:

- Area A – Former Fujitsu site;
- Area B – Former Fujitsu site and existing operational land;
- Area C – Former Microsystems site;
- Area D – Former Fujitsu site and existing Space car park;
- Area E – Existing MCC car park; and
- Area F – Former Armstrong Pumps / Baric Pumps site.

A plan showing the areas is included above in Section 2.1.The area in question within this report (Phase 3) pertains to the area noted as Area B the former Fujitsu site and operational land, therefore, the information relevant to Area B (referred to as the site from here on) only has been included within the below summary, as well as any Space Studios site-wide key information.

At the time of writing the site was occupied by a tower block, known as Wenlock Tower, which was occupied by Manchester City Council. Given the nature of the site use a site walkover was not undertaken. Walkover surveys were undertaken for other areas of the wider site, refer to the full Integra Consulting report in Appendix 11 for details.

Site History

| Date | On-Site Site Features | Wider Space Studios Site Features |
|---|---|---|
| **1848 – 1893** | The site is noted to be open fields with no notable features on-site. | Bleach and Dye works are noted in the eastern half of the wider Space Studios site. |
| **1893 – 1953** | By 1890s numerous rows of terraced houses are present in the western half of the site and Union Iron Works is recorded in the eastern half of the site. | Dalton chemical Works and Engineering Works are recorded in eastern half of the wider Space Studios site with associated reservoir, tank and chimneys. |

| | | |
|---|---|---|
| **1953 – 1975** | The site appears relatively unchanged with the exception of the expansion of the Iron Works until the 1950s when the majority of the terraced houses in the western site section appear to have been demolished. | Significant changed occurred across the wider Space Studios site in the early 20th Century, primarily the expansion of the Union Iron Works across the majority of the wider site and thus the demolition of the chemical works, engineering works and associated tanks and chimneys, and infilling of the reservoir. It should also be noted that Ruins are recorded in the north eastern corner of the wider site indicating bomb damage following WWII. |
| **1975 - 1977** | By 1975, all of the terraced houses have been demolished and a new building has been constructed in the western site section, suspected to be the Wenlock Tower. | Numerous Works including an Electricity Engineering Works are recorded across the wider site. |
| **1977 - 2017** | The large building associated with the Iron Works in the eastern site section appears to have been demolished and a new building constructed in its place as well as externals areas. | The extensive Works buildings appear to have been demolished and new buildings, also recorded as Works, constructed. |
| **2017 - 2018** | The site remains relatively unchanged until the demolition of the on-site buildings in c. 2018. | The wider site has remained relatively unchanged since. |
| **2018 – 2021** | The site has remained relatively unchanged and has remained a vacant area of land since. | |

Given the industrial nature of the surrounding area, numerous works including chemical works, boiler works, pulley works and unspecified works as well as brick fields and depots have been located in close proximity (<250m) of the site until the late 20th Century.

## Geology

The site is noted to be underlain by superficial deposits comprising Glacial Till (typically clay with bands of sand and gravel) and bedrock comprising the Halesowen Formation (mudstone with subordinate beds of sandstone and limestone). The desk study noted that the Great Mine Limestone band (1.5m – 2.7m thick) is noted to sub crop c. 45m east of the site, in the eastern section of the wider Space Studios site.

## Coal

A Coal Authority Mining report was obtained during the previous desk study as the site lies within a Coal Authority Coal Mining Reporting Area. The report stated that the site is in the likely zone of influence from workings in 4 No. coal seams at depths of between 280m to 1080m bgl, last worked in 1957. The Coal Authority stated that any ground movement from these coal workings should have ceased.

Previous Works

The Integra Consulting Phase 1 report summarises previous intrusive works undertaken by Atkins Environmental and Curtins on the wider Space Studios site. The previous work recorded elevated concentrations of total petroleum hydrocarbons (TPH) and localised hotspots of TPH, volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs), BTEX and metals within solid, leachate and groundwater samples. Asbestos was also recorded in solid samples.

Conceptual Site Model

The potential sources of contamination identified on-site include the following:

- Made Ground
- Historical Iron Works
- Historical Terraced Housing
- Off-Site Contaminative Migration

These were all noted to be potential sources of a wide range of determinands including metals and semi-metals, total petroleum hydrocarbons (TPH), polyaromatic hydrocarbons (PAHs), asbestos, Polychlorinated Biphenyls (PCBs) and phenols.

Based on the historical site uses and potential for uncontrolled movement of site materials during 19th and 20th Century, it was concluded that widespread contamination was anticipated on-site. Consequently, a moderate risk to construction workers identified but the risk to end users was deemed low based on the commercial end use. The ground gas risk was deemed low as the only on-site source was Made Ground.

Based on the on-site sources and possible pathways, including along historical drainage, the risk to controlled waters was deemed to be low to moderate.

Unexploded Ordnance

As part of the previous desk study detailed Unexploded Ordnance (UXO) Threat and Risk Assessment report was obtained for the wider site which noted that an unspecified factory building located in the eastern section of Space Studios site was used for the manufacture and storage of munitions during WWI. As noted above, the presence of possible bomb ruins were also noted in the north eastern site section following WWII. Consequently, a medium to high risk determined by Alpla 6.

However, given the extensive demolition and enabling works undertaken since the previous detailed UXO risk assessment was undertaken, an updated detailed UXO risk assessment has been obtained which is discussed in Section 6.7.

The full report is included in Appendix 11.

### 2.2.2 Integra Consulting Phase 2 Environmental Ground Investigation

The Integra Consulting Phase 2 Environmental Ground Investigation Report (Ref: 2913-05 Rev A, Dated May 2017) was undertaken on the Wenlock Tower Complex (western area of Build Phase 3) in April 2017 and comprised 10 No. window sample holes to depths of between 0.40m and 3.50m bgl (51.40m – 48.40m AOD) and associated chemical laboratory testing. The ground investigation was undertaken within external areas only as asbestos containing materials (ACMs) were identified by the specialist consultant AEC across the interior of the on-site buildings.

The typical ground conditions encountered were summarised as follows:

- MADE GROUND comprising TARMACADAM to a depth of 0.10m bgl, underlain by:
- MADE GROUND (Sub-base) comprising yellowish grey, subangular to subrounded, fine to coarse GRAVEL to a depth of 0.50m bgl, underlain by:
- MADE GROUND comprising brown, mottled black, gravelly, clayey SAND or gravelly, sandy CLAY to a depth of 1.50m bgl, underlain by:
- GLACIAL TILL comprising soft to firm, grey, slightly gravelly, silty CLAY to a depth of 1.80m bgl, underlain by;
- GLACIAL TILL comprising stiff to very stiff, friable, brown, mottled grey, slightly gravelly, slightly sandy, silty CLAY to termination at 3.50m bgl

Obstructions were only encountered at shallow depths in localised areas (WS06 and WS06A at 0.40m bgl), however, as discussed previously, the former buildings were still present at the time of the intrusive works.

Chemical testing was undertaken on 15 No. solid samples and 3 No. groundwater samples. The results showed a single lead GAC exceedance for the commercial land use scenario (3000mg/kg in WS02A at 0.0m – 0.40m bgl) within a sub-base sample and asbestos in a single Made Ground sample (5.6% chrysotile lagging in WS04 at 0.30m – 0.80m bgl). Based on the above, the risk to controlled waters was deemed low.

Due to the asbestos identified in a Made Ground sample, it was considered possible for further unrecorded asbestos to be present within the Made Ground. Asbestos containing materials were also noted within the buildings. Consequently, the risk to construction workers was deemed moderate to high. The risk to end users was deemed low as no significant pathways were identified across the site following development of the site given the presence of hardstanding. However, given the increased risk in areas of soft landscaping, a 300mm cover system was recommended.

4 No. ground gas monitoring wells were installed as part of the works and 5 No. subsequent ground gas monitoring visits were undertaken. A maximum carbon dioxide concentration of 7.8% was recorded, though no methane or steady flow rates were recorded. Consequently, the site was classified as a Characteristic Situation 1.

The full report is included in Appendix 12.

## 2.3 Demolition and Enabling Works

Since the previous Phase 1 and Phase 2 works were undertaken in 2015 and 2017, the former buildings have been demolished and significant enabling works undertaken.

The work included the demolition of the former Wenlock Tower Block, the R&D Block, the Executive Building, the Kitchen Building and any other structures within the Phase 3 boundary. The ground floor slabs, foundations and external structures of all buildings were all removed and the resultant excavations backfilled with clean 6F2 material in 225mm maximum layers to achieve a 5% CBR. All existing hardstanding, external structures and soft landscaping areas were removed, with the exception of certain trees which were to be protected and retained.

Any major obstructions found during the demolition of the basement slab were surveyed accurately. A topographical survey of any remaining below ground obstructions (i.e. piles) were also undertaken following site strip and removal of pile caps. Existing piles remain in-situ in the central site section.

All existing surface and foul water drainage runs were also grubbed within the site boundary, however site drainage connections were plugged and retained. All underground services were also disconnected.

Following completion of the above work all surplus demolition material was removed from site and the site capped with a minimum of 300mm of clean 6F2. A verification report was then provided including verification of the above works.

## 3.0 SCOPE OF INVESTIGATION WORK

This geo-environmental ground investigation has been designed to investigate the underlying ground conditions following demolition and enabling works at the site and to meet the Client requirements in relation to the proposed development outlined in Section 1.0.

The ground investigation works were undertaken on and between the 23rd and 25th June 2021 comprising 11 No. trial pits, 12 No. window sample holes, 3 No. cable percussive boreholes and 4 No. dynamic cone penetrometer tests (DCPs). Subsequent chemical and geotechnical laboratory testing was undertaken between the 24th June and 23rd July 2021.

Drilling of window sample holes was undertaken by Earth Engineering Ltd. Drilling of cable percussive boreholes was undertaken by DMW Drilling Ltd. Testing of soil samples for environmental and geotechnical purposes was carried out by i2 Analytical Ltd in accordance with the Environment Agency’s MCERTS (Monitoring Certification) quality assurance accreditation scheme. These organisations were appointed directly by Integra Consulting Ltd. to carry out these contracting works.

The ground investigation was undertaken in general accordance with:

- BS 5930 (2015) + A1 (2020) Code of Practice for Ground Investigation;
- BS 1377 (1990) Methods of test for Soils for Civil Engineering Purposes;
- BS 10175 (2011) Investigation of Potentially Contaminated Sites – Code of Practice; and
- BS EN 1997-2 (2007) Eurocode 7 – Geotechnical Design – Ground Investigation and Testing.

The sampling strategy for the site has been completed in accordance with CLR4 and the design of the investigation was carried out in accordance with R&D Technical Report P 5-TR066, LCRM (2020) and BS:8485 (2015) + A1 (2019). Further details pertaining to the site investigation works are outlined in the following sections.

The limitations of the investigation work and report are included in Appendix 1.

The window sample holes, cable percussive boreholes and trial pits were undertaken in order to achieve the following:

- to establish the thickness, extent and characteristics of the underlying Made Ground and natural superficial deposits,
- to undertake in-situ geotechnical testing within these deposits;
- to obtain samples from these deposits for classification;
- to establish the presence of any visual and / or olfactory evidence of contamination;

## 3.1 Window Sample Holes

In total, 12 No. window sample holes were constructed on a spatial basis to depths of between 0.75m and 4.25m bgl (48.24m and 51.40m AOD). All window sample holes were terminated on refusals within the Glacial Till, with the exception of WS06 which was terminated at 2.00m bgl due upon advice from the UXO Engineer. WS03 and WS03A met obstructions at 0.75m bgl within the hand-dug service pits and were consequently abandoned.

The locations of the window sample holes are shown on the exploratory hole location plan in Appendix 4 and the window sample hole logs are contained in Appendix 5.

## 3.2 Cable Percussive Boreholes

3 No. cable percussive boreholes were undertaken on a spatial basis to depths of between 7.95m and 8.45m bgl (43.11m and 43.99m AOD). All cable percussive boreholes were terminated on refusal within suspected weathered bedrock.

The locations of the cable percussive boreholes are shown on the exploratory hole location plan in Appendix 4 and the cable percussive borehole logs are contained in Appendix 6.

## 3.3 Trial Pits

11 No. trial pits were undertaken on a spatial basis to depths of between 0.70m and 2.50m bgl (49.11m and 51.62m AOD).

The locations of the trial pits are shown on the exploratory hole location plan in Appendix 4 and the window sample hole logs are contained in Appendix 7.

## 3.4 Site Testing and Sampling

The following site tests and sampling was carried out:

a) Retrieval of bulk disturbed samples from trial pits, window sample hole and cable percussive hole starter pits and from the cable percussive boreholes.

b) Where possible, in-situ and ex-situ shear strength testing was undertaken within cohesive / fine grained material (clay) from the trial pits and window sample sleeve samples using a hand shear vane (HSV) 19mm vane in accordance with BS1377-9.

c) Standard Penetration Tests (SPTs) were undertaken at regular 1.00m intervals within the window sample holes and cable percussive boreholes.

d) 4 No. Dynamic Cone Penetrometer (DCP) Tests were undertaken in order to determine the equivalent CBR value of the existing materials.

## 3.5 Laboratory Testing

### 3.5.1 Chemical Laboratory Testing

30 No. soil samples were sub-sampled during the exploratory hole construction and sent to i2 Analytical laboratories for chemical testing. These samples were placed into sterile sealed containers to facilitate MCERTS (Environment Agency's Monitoring Certification scheme) chemical laboratory testing of potential contaminants as shown in Section 3.7. Chemical testing suites were based upon the possible contaminative sources identified and outlined below:

*pH, arsenic, barium, beryllium, boron, cadmium, chromium, chromium (hexavalent), copper, cyanide, lead, mercury, nickel, selenium, vanadium, zinc, sulphate, nitrate,* *cyanide (total and free), soil organic matter (SOM), Total Petroleum Hydrocarbon (TPH) with carbon banding or speciation, Speciated Polyaromatic Hydrocarbons (PAHs) and asbestos identification with asbestos quantification if ID is positive.*

*3 No. samples were also sent for Waste Acceptance Criteria (WAC) tests.*

### 3.5.2 Geotechnical Laboratory Testing

The following geotechnical laboratory tests were carried out on 10 No. selected samples obtained from across the site:

a) Determination of moisture content, liquid limit and plastic limit in accordance with BS1377 Part 2, Methods 3.2, 4.4 and 5.0 (1990).
b) Determination of particle size analysis by dry / wet sieving in accordance with BS1377 Part 2, Method 9.2 (1990).
c) Determination of quick undrained shear strength in triaxial compression in accordance with BS1377 Part 7, Method 8 (1990).

The geotechnical laboratory test results are contained in Appendix 10.

## 4.0 FINDINGS

### 4.1 Ground Conditions

The typical ground conditions encountered across the site are as follows:

- MADE GROUND comprising greyish brown, sandy GRAVEL to a depth of between 0.10m and 0.70m bgl (50.96m and 52.25m AOD) underlain by;
- MADE GROUND comprising dark brown to dark grey, gravelly, silty, fine to coarse SAND with a low cobble content and by firm, dark greyish brown, slightly gravelly, slightly sandy CLAY to a depth of between 0.60m and 1.80m bgl (49.81m and 51.24m AOD), underlain by;
- GLACIAL TILL comprising firm to stiff, brown, slightly gravelly, slightly sandy CLAY with occasional thin to thick bands of medium dense to very dense, brown, silty, fine to coarse sand to a depth of between 7.50m and 8.00m bgl (43.56m and 44.44m AOD), underlain by;
- Weathered HALESOWEN FORMATION comprising light bluish grey, angular to subangular, fine to coarse GRAVEL of mudstone and sandstone.

The bedrock is anticipated to be dipping to the south west at a dip of 18° however no significant bedrock dip was evident within the boreholes undertaken.

Notable Exceptions

- The surface Made Ground (6F2) was recorded to a depth of 1.20m bgl (51.36m AOD) in WS08, anticipated to be the location of a former subterranean feature which was excavated and replaced with 6F2 as part of the demolition and enabling works.
- Deep cohesive Made Ground or possibly reworked clay was recoded in TP04 and WS07 to depths of between 2.10m and 2.60m bgl respectively (49.91m and 49.09m AOD).

Obstructions

Obstructions were recorded in the locations of WS03 and WS03A at a depth of 0.75m bgl and in the location of TP11 at 1.20m bgl, the obstructions were recorded within the Made Ground. It is unknown what the obstructions pertain to.

It should also be noted that although all services were assumed to have been disconnected and removed during demolition and enabling works, with the exception of CCTV / Lighting cables, some ceramic land drains were encountered within trial pits.

For further details regarding the ground conditions encountered, refer to the exploratory hole logs contained in Appendices 5, 6 & 7.

## 4.2 Visual and Olfactory Contamination Findings

During the intrusive exploratory hole investigation works, the soils were examined carefully for both visual and olfactory evidence of contamination. The following visual or olfactory evidence of contamination was encountered during the site investigation works:

- A bituminous odour was noted within granular Made Ground in WS06 between 0.90m and 1.35m bgl.
- A mild bituminous odour was noted in cohesive Made Ground in TP04 between 0.95m and 1.20m bgl.
- A mild organic odour was noted to soft, light grey Glacial Till in WS07 between 2.10m and 2.60m bgl

## 4.3 Water Strikes

Only a single water strike was recorded during the site investigation works in BH01 at 7.00m bgl within the Glacial Till.

## 4.4 Geotechnical Site Testing

The results of the in-situ site tests undertaken during the site investigation are summarised below.

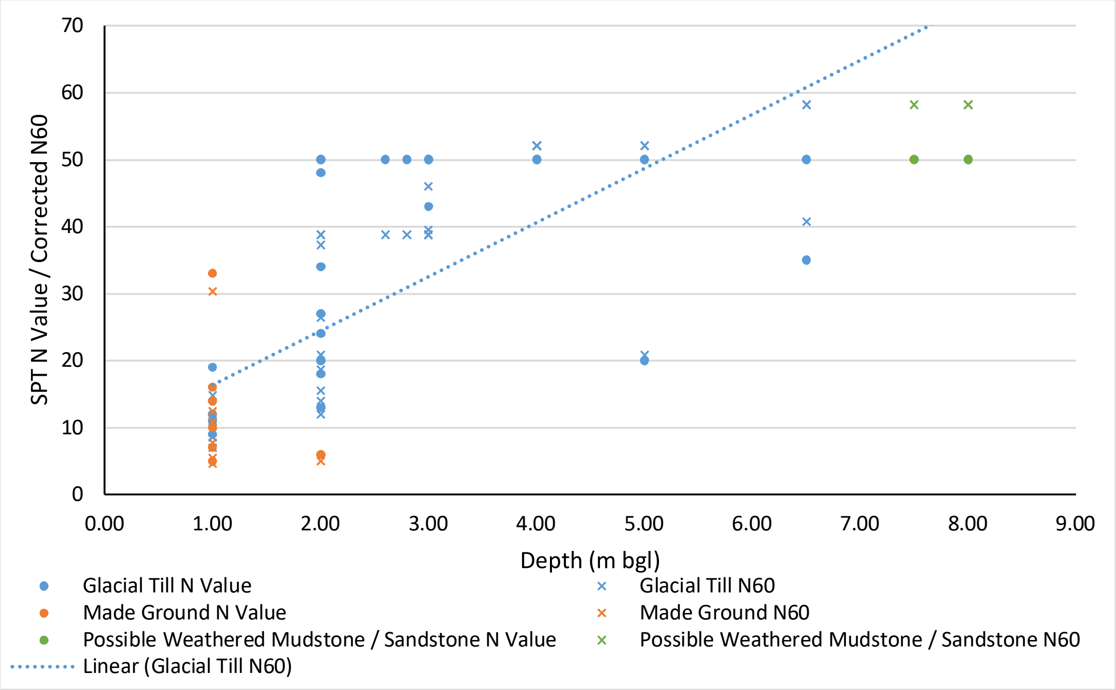
### 4.4.1 Standard Penetration Tests

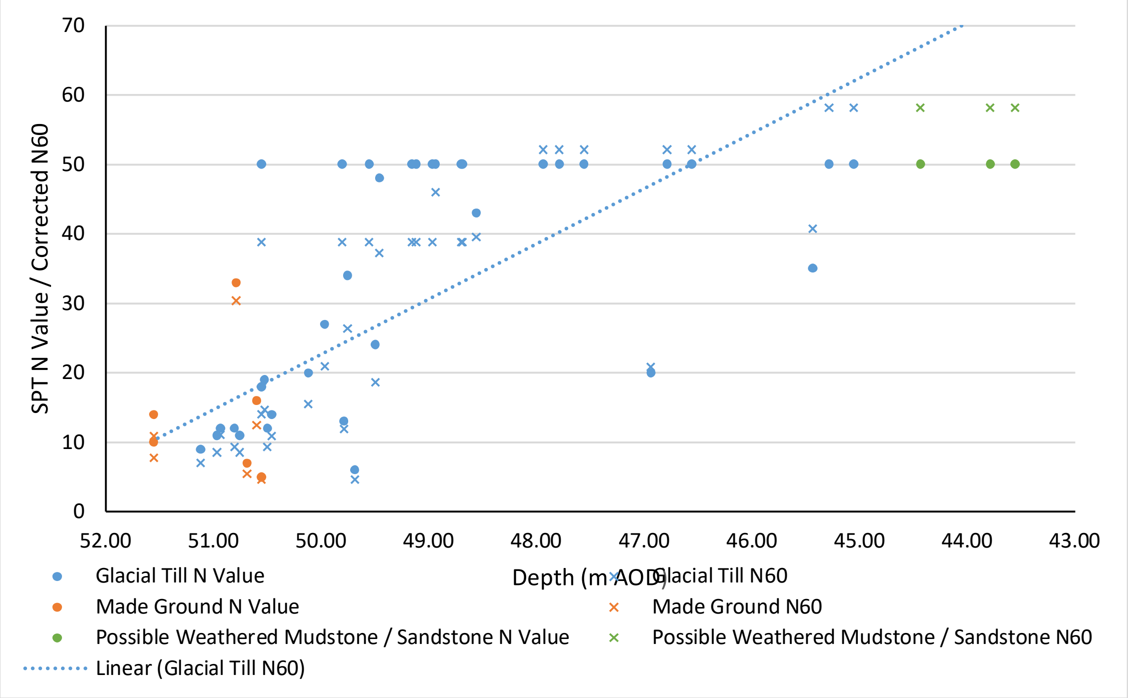
SPT tests were undertaken at regular 1.00m intervals during the construction of the window sample holes and cable percussive boreholes. The following table outlines the uncorrected N-Values and corrected $N_{60}$ values (energy ratio of 62% for the window sample rig and 70% for the cable percussive rig), derived from the SPT tests undertaken in the Made Ground, Glacial Till and suspected weathered bedrock.

| Deposit Type | Depth Range of Test Start Depths m bgl (m AOD) | Number of Tests | Uncorrected N-Value Range | Uncorrected N-Value Average | Corrected $N_{60}$ Range | Corrected $N_{60}$ Average |
|---|---|---|---|---|---|---|
| MADE GROUND | 1.00<br>(50.56 – 51.56) | 7 | 6 – 33 | 13 | 5 – 30 | 11 |
| GLACIAL TILL | 1.00 – 6.50<br>(45.06 – 51.12) | 35 | 9 – 50 | 35 | 7 – 58 | 31 |
| WEATHERED BEDROCK | 7.50 – 8.00<br>(43.56 – 44.44) | 3 | 50 | 50 | 58 | 58 |

The following scatter graphs show the correlation between the uncorrected N-value and corrected $N_{60}$ values with depth. A clear increase in N-value / N60 value with depth can be seen for Glacial Till, although variability is recorded which is anticipated to be due to the presence of localised sand bands.

No correlation can be made for weathered bedrock as all standard penetration tests resulted in a refusal and no correlation can be made with depth for the Made Ground as all standard penetration tests were undertaken at 1.00m bgl and the site is relatively flat.





Utilising the *Stroud and Butler (1975)* correlation between SPT N values and undrained shear strengths in low to moderate plasticity clays (IP <0 – 40). The N values for depths between 1.00m and 6.50m bgl have been used semi-empirically to calculate approximate equivalent shear strength of the Glacial Till deposits in WS01 – 10:

| Depth (m bgl) | Average Shear Strength (kN/m$^2$) |
|---|---|
| 1.00 – 2.00 | 50 – 75 |
| 2.00 – 3.00 | 130 – 195 |
| 3.00 – 4.00 | 195 – 293 |
| 4.00 – 5.00 | 200 – 300 |
| 5.00 – 6.50 | 170 – 255 |

For detailed, specific information pertaining to the SPT tests undertaken, refer to the window sample logs and cable percussive borehole logs contained within Appendices 5 and 6.

### 4.4.2 Hand Shear Vane (19mm) Tests

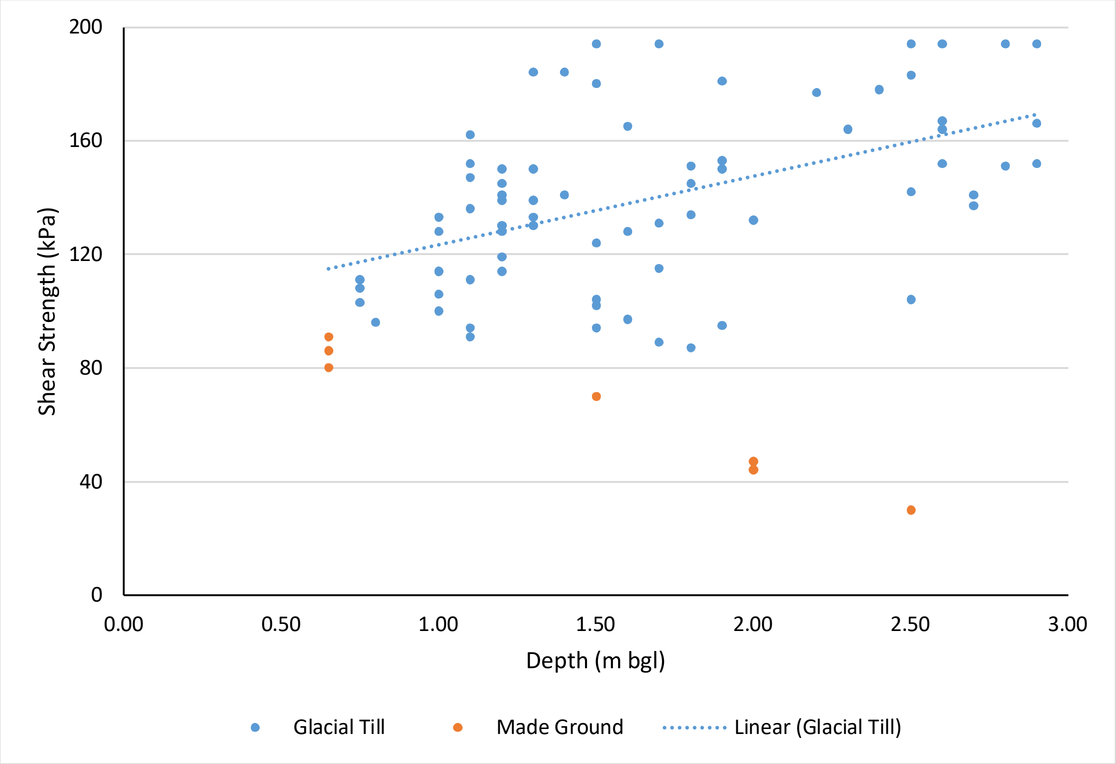
Where possible, in-situ shear strength testing was undertaken within cohesive material (clay) from the trial pits, window sample holes and cable percussive boreholes using a hand shear vane (19mm vane) in accordance with BS1377-9. The following table outlines the undrained shear strength values obtained within cohesive strata encountered during the site investigation:

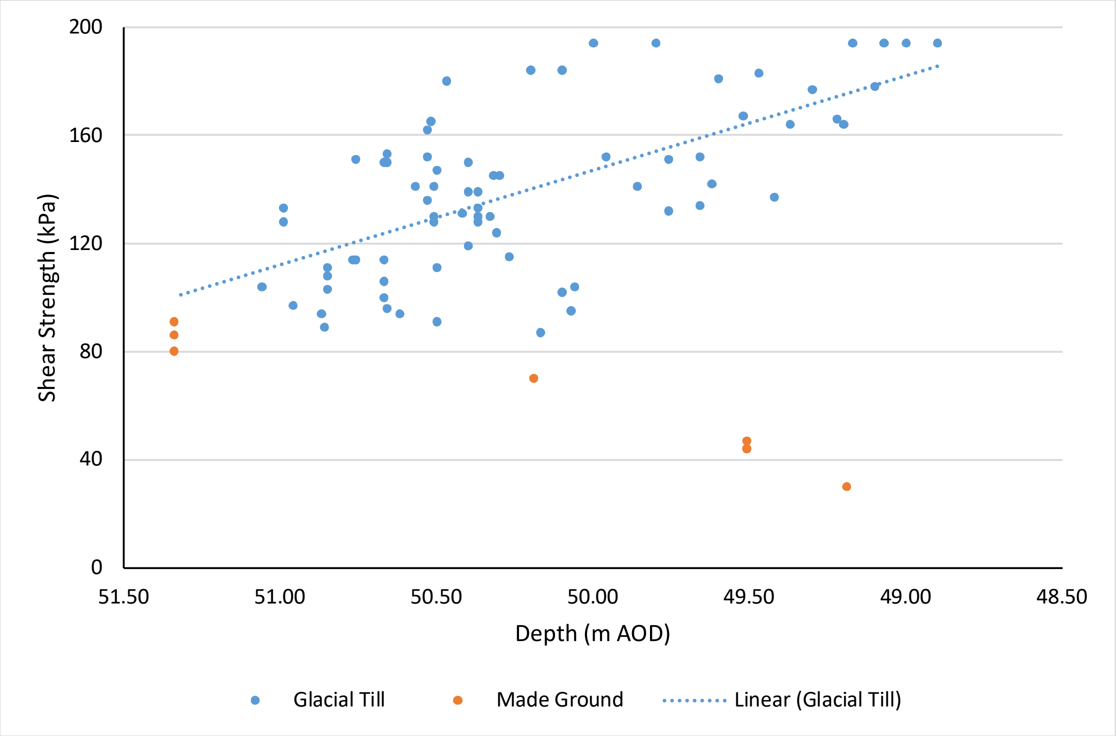
| Deposit Type | Number of Tests | Depth Range m bgl (m AOD) | Shear Strength Range (kPa) | Shear Strength Average (kPa) |
|---|---|---|---|---|
| MADE GROUND | 8 | 0.65 – 2.50<br>(49.61 – 51.34) | 30 – 91 | 62 |
| GLACIAL TILL | 74 | 0.75 – 2.90<br>(48.90 – 51.06) | 87 – 194 | 139 |

*Where hand shear vane test results have been recorded as 194kPa, maximum limit of shear vane has been reached and shear strength is 194kPa+. A value of 120 is used in this case to calculate the arithmetic mean.

Scatter graphs are included below which show that the shear strength of the Glacial Till increases with depth (m bgl and m AOD). It should be noted that variability has been recorded, anticipated due to the presence of granular secondary constituents including sand, silt and gravel, however the majority of the hand shear vanes recorded shear strengths of >100kPa.

Given the limited number of hand shear vane tests that could be undertaken within cohesive Made Ground deposits, no correlation with depth can be made.





For detailed, specific information pertaining to the hand shear vane tests, please refer to the window sample, cable percussive borehole and trial pit logs contained within Appendices 5, 6 and 7, respectively.

### 4.4.1 Dynamic Cone Penetrometer Tests

4 No. Dynamic Cone Penetrometer Tests were undertaken to depths of between 0.708m and 0.935m bgl at WS09, WS10, WS11 and WS12 within the proposed car parking areas. The results of the DCP tests are summarised in the below table:

| Test | Layer | Equivalent CBR Value (%) | Layer Thickness (mm) | Total Depth (mm) |
|---|---|---|---|---|
| DCP01 (WS09) | 1 | **45.8** | 357 | 424 |
| | 2 | **10.8** | 398 | 822 |
| | 3 | **94.6** | 12 | 834 |
| | | | | |
| DCP02 (WS10) | 1 | **9.7** | 232 | 294 |
| | 2 | **64.4** | 414 | 708 |
| | | | | |
| DCP03 (WS11) | 1 | **6.7** | 184 | 237 |
| | 2 | **26.5** | 70 | 307 |
| | 3 | **4.7** | 205 | 512 |
| | 4 | **14.4** | 410 | 922 |
| | | | | |
| DCP04 (WS12) | 1 | **15.5** | 366 | 417 |
| | 2 | **39.7** | 232 | 649 |
| | 3 | **18.1** | 286 | 935 |
| | | | | |

*Test starting depths range from 51mm-67mm bgl.*

Full dynamic cone penetrometer test results are contained in Appendix 8.

## 4.5 Geotechnical Laboratory Testing

The results of the geotechnical laboratory tests undertaken during the site investigation are summarised below.

### 4.5.1 Atterberg Limit Tests

Atterberg limit tests were undertaken on 8 No. samples from natural Glacial Till deposits. The results of the Atterberg testing are as follows:

| Sample | Sample Depth (m bgl) | Strata | Moisture Content (%) | Liquid Limit (%) | Plastic Limit (%) | Plasticity Index | Passing through 425 micron (%) | Modified Plasticity Index |
|---|---|---|---|---|---|---|---|---|
| BH01 | 2.00 | GT | 11 | 33 | 17 | 16 | 91 | 15 |
| BH01 | 6.50 | GT | 10 | 31 | 13 | 18 | 90 | 16 |
| BH02 | 3.00 | GT | 11 | 27 | 12 | 15 | 83 | 12 |
| BH02 | 4.00 | GT | 9 | 29 | 12 | 17 | 78 | 13 |
| BH03 | 2.00 | GT | 15 | 29 | 16 | 13 | 89 | 12 |
| BH03 | 5.00 | GT | 10 | 30 | 14 | 16 | 82 | 13 |
| TP03 | 1.20 | GT | 19 | 46 | 21 | 25 | 97 | 24 |
| TP09 | 0.90 | GT | 23 | 41 | 21 | 20 | 100 | 20 |
| | | | 13 | 33 | 16 | 18 | 89 | 16 |

The Atterberg Limit tests indicate that the Glacial Till deposits are generally clays of low plasticity. The samples from TP03 and TP09 exhibit intermediate plasticity.

Full geotechnical test results are contained in Appendix 10.

### 4.5.2 Particle Size Distribution Tests

Particle size distribution (PSD) tests were undertaken on 2 No. samples taken from varying depths within the Glacial Till deposits.

| Sample | Sample Depth (m bgl) | Deposit Type | Cobbles / Boulders (%) | Gravel (%) | Sand (%) | Fines (%) |
|---|---|---|---|---|---|---|
| TP05 | 2.00 | Glacial Till | 0 | 1 | 71 | 28 |
| TP07 | 1.70 – 2.00 | Glacial Till | 0 | 4 | 61 | 35 |

Full geotechnical test results are included in Appendix 10.

## 4.6 Environmental Laboratory Test Results

The findings of the chemical test results, summarised below, will be assessed against generic assessment criteria (GAC) for the purposes of screening allowable concentrations in comparison to the measured site concentrations. The GAC are defined based on the critical receptors identified at the site. Receptors are considered primarily in relation to human health receptors (e.g. end-users, construction workers and the general public) via measured solid concentrations. Additional receptors may be relevant dependant on the site e.g. flora/fauna, water, buried concrete.

The GAC adopted for assessment of soils in relation to Human Health are based on published LQM/CIEH S4ULs (2015) for those compounds for which published criteria are available for varying scenarios (residential, commercial, allotment, public open space). In the absence of LQM/CIEH S4ULs (2015) the following GAC defining documents are adopted - CL:AIRE Soil GAC for Human Health Assessment (2010) and Category 4 Screening Levels (C4SLs) (2014).

The primary risk to human receptors from free cyanide in soils is an acute risk (i.e. a single dose could have a lethal affect as opposed to adverse effects from cumulative intake (chronic affect)). There is no current UK guidance available for calculating acute risks from free cyanide, therefore an in-house methodology has been used to derive an acute GAC of 60 mg/kg for all exposure scenarios. The value is given for Free or Easily Liberatable Cyanide but should be used to assess Total Cyanide in the absence of cyanide speciation. In cases where the Total Cyanide exceeds the GAC then analysis for Free or Easily Liberatable Cyanide should be completed.

GACs / Tier 1s 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. GACs utilised include - The River Basin Districts Typology, Standards and Groundwater threshold values (Water Framework Directive) (England and Wales) Directions 2009 (Part 7:Groundwater Threshold Values), UK Drinking Water Standards (2000), Environmental Quality Standards, World Health Organisation concentrations, Environment Agency guidance concentrations and United States Environmental Protection Agency – Region 9 GACs.

### 4.6.1 Solid Samples

Summary tables indicating the results, assessed against their relevant GACs (**commercial land use scenario**), are noted below. 28 No. Made Ground samples and 2 No. natural Glacial Till samples were sent for chemical testing.

### Solid Contamination Results – Made Ground

| Determinand | No. of Samples | Range of Results | Mean | GAC | Exceeded Allowable |
|---|---|---|---|---|---|
| **Inorganics, Carbon and Asbestos** | | | | | |
| Asbestos Quantification (%) | 28 | None Detected - <0.001% loose fibrous debris | | - | - |
| Water Soluble Sulphate as SO4 2:1 Extract (mg/l) | 8 | 264 – 1910 | 723.5 | - | - |
| Soil Organic Matter (%) | 8 | 0.70 – 2.90 | 1.48 | - | - |
| pH | 8 | 6.9 – 10.3 | 8.22 | - | - |
| Cyanide, Total | 8 | <1.00 | <1.00 | $60^2$ | **0** |
| Cyanide, Free | 8 | <1.00 | <1.00 | $60^2$ | **0** |
| Nitrate as $NO_3$ 2:1 water soluble (mg/l) | 8 | <5.00 – 5.40 | 5.07 | - | - |
| Boron (hot water soluble) | 8 | 0.40 – 4.20 | 1.50 | 240000 | **0** |
| Metals and Semi-Metals | | | | | |
| Arsenic | 8 | 8.30 – 35.0 | 20.55 | 640 | **0** |
| Barium | 8 | 68.0 – 530 | 211.33 | $22000^{(2)}$ | **0** |
| Beryllium | 8 | 0.54 – 1.10 | 0.87 | 12 | **0** |
| Cadmium | 8 | <0.20 | <0.20 | 190 | **0** |
| Chromium | 8 | 15.0 – 31.0 | 23.0 | 8600 | **0** |
| Copper | 8 | 22.0 – 310 | 158.33 | 68000 | **0** |
| Mercury | 8 | <0.30 | <0.30 | 58 | **0** |
| Nickel | 8 | 12.0 – 39.0 | 23.83 | 980 | **0** |
| Lead | 8 | 26.0 – 490 | 158.17 | 2330 | **0** |
| Selenium | 8 | <1.00 | <1.00 | 12000 | **0** |
| Vanadium | 8 | 21.0 – 70.0 | 37.77 | 9000 | **0** |
| Zinc | 8 | 52.0 – 250 | 112 | 730000 | **0** |
| Chromium (Hexavalent) | 8 | <1.20 | <1.20 | 33 | **0** |
| **Total Petroleum Hydrocarbons Screen** | | | | | |
| Petroleum Range Organics | 8 | <0.1 | <0.10 | - | - |
| TPH C10 – C40 | 8 | <10 – 310 | 119 | - | - |
| TPH C6 – C10 | 8 | <0.10 | <0.10 | - | - |
| TPH C6 – C40 | 8 | <10 – 310 | 119 | - | - |
| TPH C10 – C25 | 8 | <10 – 150 | 53.67 | - | - |
| TPH C25 – C40 | 8 | <10 – 160 | 66.83 | - | - |
| **Polynuclear Aromatic Hydrocarbons (PAHs)** | | | | | |
| Naphthalene | 8 | <0.05 – 1.30 | 0.26 | 190 | **0** |
| Acenaphthylene | 8 | <0.05 | 0.05 | 83000 | **0** |
| Acenaphthene | 8 | <0.05 – 0.43 | 0.21 | 84000 | **0** |
| Fluorene | 8 | <0.05 – 0.26 | 0.15 | 63000 | **0** |
| Phenanthrene | 8 | <0.05 – 4.20 | 1.76 | 22000 | **0** |
| Anthracene | 8 | <0.05 – 1.10 | 0.51 | 520000 | **0** |
| Fluoranthene | 8 | <0.05 – 13.0 | 3.74 | 23000 | **0** |
| Pyrene | 8 | <0.05 – 12.0 | 3.71 | 54000 | **0** |

| | | | | | |
|---|---|---|---|---|---|
| Benzo(a)anthracene | 8 | <0.05 – 6.90 | 2.01 | 170 | **0** |
| Chrysene | 8 | <0.05 – 4.70 | 1.59 | 350 | **0** |
| Benzo(b)fluoranthene | 8 | <0.09 – 6.80 | 2.19 | 44 | **0** |
| Benzo(k)fluoranthene | 8 | <0.05 – 2.70 | 0.84 | 1200 | **0** |
| Benzo(a)pyrene | 8 | <0.05 – 6.50 | 2.14 | 35 | **0** |
| Indeno(1,2,3-cd)pyrene | 8 | <0.05 – 3.10 | 1.17 | 500 | **0** |
| Dibenz(a,h)anthracene | 8 | <0.05 – 0.93 | 0.36 | 3.5 | **0** |
| Benzo(ghi)perylene | 8 | <0.05 – 4.10 | 1.49 | 3900 | **0** |
| Total PAH (Sum of USEPA 16) | 8 | <0.80 – 68.0 | 22.02 | 190 | **0** |

*Generic Assessment Criteria Used: LQM/CIEH S4ULs for Human Health Risk Assessment (3rd edition, 2015), unless stated:*

1) *Category 4 Screening Levels (March 2014)*
2) *In-house screening value has been used as no GAC methodology currently exists*
3) *CL:AIRE Soil GAC for Human Health Assessment (January 2010)*

**Note 1** – Units are in mg/kg unless stated.
**Note 2** – Used 1% SOM (average organic matter %) used for GACs as a conservative measure.
**Note 3** – Detection limit values used to calculate arithmetic mean

## Solid Contamination Results – Glacial Till

| **Determinand** | **No. of Samples** | **Range of Results** | **Mean** | **GAC** | **Exceeded Allowable** |
|---|---|---|---|---|---|
| **Inorganics, Carbon and Asbestos** | | | | | |
| Water Soluble Sulphate as SO4 2:1 Extract (mg/l) | 2 | 146 – 154 | 150 | - | **-** |
| Soil Organic Matter (%) | 2 | 0.90 – 1.10 | 1.00 | - | **-** |
| pH | 2 | 7.4 – 9.4 | 7.65 | - | **-** |
| Cyanide, Total | 2 | <1.00 | <1.00 | 60(1) | **0** |
| Cyanide, Free | 2 | <1.00 | <1.00 | 60(1) | **0** |
| Nitrate as $NO_3$ 2:1 water soluble (mg/l) | 2 | 3.20 – 20.0 | 11.6 | - | **-** |
| Boron (hot water soluble) | 2 | 0.30 – 0.40 | 0.35 | 240000 | **0** |
| Metals and Semi-Metals | | | | | |
| Arsenic | 2 | 9.6 – 11.0 | 10.3 | 640 | **0** |
| Barium | 2 | 140 – 410 | 275 | 22000 | **0** |
| Beryllium | 2 | <1.50 | <1.50 | 12 | **0** |
| Cadmium | 2 | <0.20 | <0.20 | 190 | **0** |
| Chromium | 2 | 25.0 – 37.0 | 31.0 | 8600 | **0** |
| Copper | 2 | 26.0 – 28.0 | 27.0 | 68000 | **0** |
| Mercury | 2 | <0.30 | <0.30 | 58 | **0** |
| Nickel | 2 | 26.0 – 45.0 | 35.5 | 980 | **0** |
| Lead | 2 | 14.0 – 15.0 | 14.50 | 2330 | **0** |
| Selenium | 2 | <1.00 | <1.00 | 12000 | **0** |
| Vanadium | 2 | 28.0 – 39.0 | 33.50 | 9000 | **0** |
| Zinc | 2 | 57.0 – 73.0 | 65.0 | 730000 | **0** |
| Chromium (Hexavalent) | 2 | | | 33 | **0** |
| **Total Petroleum Hydrocarbons Screen** | | | | | |
| **All TPH fractions were recorded at concentrations below their respective detection limits.** | | | | | |
| **Polynuclear Aromatic Hydrocarbons (PAHs)** | | | | | |
| **All PAHs were recorded at concentrations below their respective detection limits.** | | | | | |

*Generic Assessment Criteria Used: LQM/CIEH S4ULs for Human Health Risk Assessment (3rd edition, 2015), unless stated:*

1) *Category 4 Screening Levels (March 2014)*
2) *In-house screening value has been used as no GAC methodology currently exists*

**Note 1** – Units are in mg/kg unless stated.
**Note 2** – Used 1% SOM (average organic matter %) used for GACs as a conservative measure.
**Note 3** – Detection limit values used to calculate arithmetic mean

Full chemical test results are contained in Appendix 9.

## 4.7 Aggressive Ground Conditions

In accordance with BRE Special Digest 1: Concrete in Aggressive Ground (2005), soluble sulphates within the Made Ground and Glacial Till were recorded within design sulphate levels DS-3 and subsequently within the Aggressive Chemical Environment for Concrete (ACEC) classification of AC-2s.

## 5.0 ENVIRONMENTAL CONCLUSIONS

### 5.1 Assessment of Environmental Results

No human health GAC exceedance for a commercial end use has been recorded within the Made Ground or natural deposits.

However, asbestos is the form of chrysotile loose fibrous debris was recorded at trace amounts (<0.001%) in **one of twenty eight** Made Ground samples tested (TP01 at 0.35m bgl).

WAC Testing was undertaken on 3 No. made ground samples (TP04 at 1.00m bgl, TP06 at 0.30m bgl and WS02 at 0.75m bgl). The results are contained in Appendix 9. Any assessment of these was outside the scope but can be undertaken at a later date.

### 2.4 Updated Conceptual Site Models

The original conceptual models produced in the *Integra Consulting Phase 1 and Phase 2 Geo-Environmental Investigation Report*s have been revised / updated below following the recent demolition / enabling works in 2015 – 2017 and based on the intrusive site investigation works undertaken in June 2021.

### 5.2 Revised Conceptual Models

#### 5.2.1 Human Health Risk Assessment

The possible sources of on-site contamination identified within the Phase 1 report include:

- Made Ground;
- Historical Iron Works;
- Historical Terraced Housing; and
- Migration of Off-Site Contamination.

The human health receptors identified within the previous Phase 1 and 2 reports include:

- End users (commercial land use scenario);
- Construction workers; and
- The general public and adjacent site users.

The human health pathways identified within the previous Phase 1 and 2 reports include:

- Ingestion of soil directly and indoor dust*;
- Inhalation of soil dust (indoor and outdoor);
- Dermal contact with soil (indoor and outdoor);
- Inhalation of soil vapours (indoor and outdoor);
- Oral background; and
- Inhalation background.

** Treated as one pathway*

Revised Conceptual Model for Human Health Risk Assessment

As summarised in section 2.2.2, following the previous site investigations works which identified asbestos identified in a Made Ground sample, the risk to construction workers was deemed moderate to high due to the potential for further unrecorded asbestos to be present. The risk to end users was deemed low as no significant pathways were identified across the site following development of the site given the presence of hardstanding.

Since the above conclusions were determined the asbestos containing materials (ACMs) identified within the former buildings were removed by licensed contractors and the buildings subsequently demolished. Significant enabling works have also been undertaken, therefore, the above conclusions are no longer deemed appropriate in relation to asbestos and the human health conceptual site model has been updated below;

Following the site investigation works in 2021 no human health GAC exceedances for a commercial land use scenario were recorded on-site, however, asbestos (<0.001% chrysotile loose fibrous debris) was recorded in a single Made Ground sample tested (TP01 at 0.35m bgl). Given the number of Made Ground samples tested (28 No. total), the asbestos containing material (ACM) recorded in TP01 is anticipated to be a rare occurrence and widespread asbestos contamination is not anticipated as no ACM was recorded elsewhere and no asbestos free fibres were recorded.

Although asbestos was recorded at trace amounts in a single Made Ground sample, based on the proposed development hardstanding will be present across the majority of the site (buildings, concrete and tarmacadam). Therefore, no contaminative linkages will be present to end-users as the pathways of concern (primarily inhalation) will be negated.

However, the limited areas of soft landscaping are considered to be at increased risk. The Made Ground is not considered to be a suitable growing medium therefore topsoil will need to be imported and placed in these areas which will provide a clean cover system. As such, the inhalation pathway will also be broken in areas of soft landscaping. Details of the required clean cover system are included in Section 5.2.4.

All other potentially contaminative sources can be discounted based on the chemical test results as no determinands were recorded at elevated or exceeding concentrations and no evidence of off-site migration was noted.

The imported grade 6F5 / 6F2 materials is not considered a contaminative source as chemical testing undertaken on the imported material recorded no determinands above the human health GACs and no asbestos was identified. The chemical test results undertaken on the imported material during the demolition and enabling works in contained in Appendix 13.

Therefore, the site is considered to pose a **low risk** to human health of the end-users and general public.

However, construction workers will be at increased risk as the disturbance of the soil during earthworks may lead to fibre release, consequently an asbestos risk assessment was undertaken to determine whether any remedial measures (i.e. dust supersession and decontamination) will be necessary during construction.

Based on the findings of the chemical laboratory test results, a risk assessment has been undertaken for the Made Ground using the *JIWG Decision Support Tool for the Categorisation of Work Activities Involving Asbestos in Soil or Construction & Demolition Materials in accordance with CAR 2012* (FINAL Version 2.1, March 2017). The risk assessment for the Made Ground has been undertaken based on <0.001% chrysotile loose fibrous debris.

The JIWG risk assessment, concludes that the Made Ground is suitable for re-use in the proposed development. According to the risk assessment, **CAR do not apply** to the works involving the re-use of the Made Ground, and no dust suppression or decontamination is required. However, although unlikely as only trace asbestos was recorded in one of twenty eight samples of Made Ground tested, care should be taken during earthworks as possible asbestos containing material (ACM) may be present within the Made Ground.

Consequently, and based on the above, if appropriate PPE and Health and Safety measures are utilised during construction, the risk to construction workers is also deemed **low.**

### 5.2.2 Ground Gas Risk Assessment

The possible sources of ground gas identified within the previous Phase 1 and 2 reports include:

- Made Ground (on-site and off-site)
- Potential Localised Off-Site Organic Materials / River Deposits

The human health receptors identified within the Phase 1 report include:

- End users (commercial land use scenario).
- Construction workers.
- The general public and adjacent site users.

The pathways identified within the previous Phase 1 and 2 reports include:

- Migration through fractures and fissures in bedrock and overlying superficial deposits.
- Preferential migration along foundations, service ducts / trenches
- Migration within groundwater
- Ingress through wall cavities and floors and accumulation
- Inhalation of ground gas and vapours

During the site investigation works previously undertaken by Integra Consulting in 2017, 4 No. ground gas monitoring wells were installed as part of the works and 5 No. subsequent ground gas monitoring visits were undertaken. A maximum carbon dioxide concentration of 7.8%, no methane or steady flow rates were recorded.

During the recent site investigation works widespread made ground was noted however no significant putrescible material was recorded within the made ground, as confirmed by the chemical laboratory testing which recorded organic matter contents of between 0.7% and 2.9%. Although a mild organic odour was noted to made ground between 2.10m and 2.70m bgl in WS07, no organic fragments were noted. Consequently, made ground remains a ground gas source however is considered to be of negligible ground gas generation potential based on the organic content, which concurs with the lack of flow recorded during the previous ground gas monitoring visits.

Additionally, no localised organic / river terrace deposits were noted. Therefore, the localised organic rich / river terrace deposits can be discounted as a ground gas source.

Based on the above, further ground gas monitoring was not deemed necessary as additional ground gas sources were not identified.

Consequently, results if the ground gas monitoring undertaken in 2017 have been assessed in accordance with BS 8485 (2015) + A1 (2019). The characteristic Gas Screening Value (GSV) is calculated by dividing the maximum methane or carbon dioxide concentration by 100 and multiplying by the maximum steady flow rate recorded at the same monitoring point (the instrument detection limit of 0.1 l/hr is utilised when below detection limit flow rates are recorded). If required, the worst case GSV can be calculated by dividing the maximum carbon dioxide and methane concentration by 100 and multiplying by the maximum steady flow rate on-site.

Ground gas monitoring has recorded a maximum peak carbon dioxide concentration of 7.8% v/v. No steady flow rates or methane concentrations above detection limits were recorded.

As no steady flow rates were recorded on-site, the GSV and the worst case GSV for the site can be calculated as (7.8/100)*0.1= 0.0078l/hr.

Therefore, the site falls in-line with Characteristic Situation 1 (CS1) / Green (CIRIA 665) and no ground gas protection measures are deemed necessary.

The proposed foundation / development are not regarded as creating any significant pathways or changing the ground gas regime significantly enough to change the above designation.

Radon

The Indicative Atlas of Radon in England and Wales produced by the Health Protection Agency and British Geological Survey indicates that the site lies within a lower probability area as between <1% of homes are above the action level. Consequently, BR211 (2015) indicates that no radon protection measures are necessary in the construction of new dwellings or extensions.

### 5.2.3 Controlled Waters Risk Assessment

The possible sources of on-site contamination identified within the previous Phase 1 and 2 reports include:

- Made Ground;
- Historical Iron Works;
- Historical Terraced Housing; and
- Migration of Off-Site Contamination.

The controlled water receptors identified within the previous Phase 1 and 2 reports include:

- Groundwater contained within the Secondary A Aquifer within the Halesowen Formation (unknown depth, at least 8m bgl);
- Groundwater contained within the Secondary Undifferentiated Aquifer within the Glacial Till; and
- Surface Water – brick lined partially culverted Corn Brook c. 100m south.

The controlled waters pathways identified within the previous Phase 1 and 2 reports include:

- Vertical migration along current and future foundations and pooling at base / beneath foundations;
- Vertical migration through granular Made Ground, natural granular deposits (superficial and bedrock) and granular lenses in natural cohesive deposits;
- Lateral migration along low permeability natural deposits and pooling at relative low points;
- Negligible infiltration through low-permeability natural cohesive deposits;
- Migration through porous sandstone bedrock;
- Migration along groundwater flow; and
- Overland flow.

Revised Conceptual Model for Controlled Waters Risk Assessment

Based on the findings of the recent site investigation works, the conceptual site model has been updated as follows:

As discussed in Section 2.2.2, the risk to controlled waters was previously determined to be low following the Integra Consulting 2017 site investigation works as no significant pollutant linkages were identified. Further considerations included the lack of contamination recorded and the presence of low permeability Glacial Till across the site negating transport pathways to the underlying aquifers.

The additional chemical testing undertaken during the recent site investigation works concur with the above. Additionally, no shallow groundwater was recorded within the Glacial Till (Secondary Undifferentiated Aquifer) and all of the historical drainage has since been removed during demolition works which is deemed to be a betterment as an additional potential source and pathway has been removed.

Consequently, the risk to controlled water remains **low** given the lack of contaminative linkages identified.

### 5.2.4 Remedial Strategy

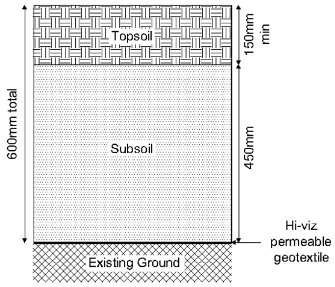
The above contaminated land assessment indicates the following actions in relation to the conceptual site models:

- No ground gas or radon protection measures are required.
- No controlled water remediation activities are required .
- No human health requirements are required for the site with the exception of areas of soft landscaping – a clean cover system will be required in these areas due to the asbestos identified.

Clean Cover System

Based on the above human health risk assessment, a **600mm** clean cover system is to be installed across the soft landscaping areas of the proposed development, which is to consist of:

- A minimum of 150mm up to a maximum of 300mm topsoil, underlain by
- Up to 450mm subsoil, underlain by
- A hi-viz permeable geotextile marker



It is anticipated that soils for use in the above recommended cover system will be imported from off-site. These must be validated as detailed below to ensure their suitability for use (i.e., no glass or plastic is to be included and meets chemical testing acceptability criteria). Natural subsoils may also be won from drainage trench excavation arisings and the like during development. These must also be chemically tested as with imported soils to ensure their suitability for use.

## Validation Requirements

### Clean Cover System

Once the clean cover system has been installed, validation requirements include:

- Details of the source of the cover material;
- Waste transfer notes to provide evidence of source (where soils are imported);
- Confirmation of cover depth by either measurement tape or topographical survey with photographs at a frequency of one pit per 'area'.
- Imported topsoil and subsoil is required to be tested at source prior to import to confirm suitability. All topsoil and subsoil, whether site-won or imported is required to be tested at the following frequency:

| Source | Material End Use | Sampling Frequency[1] |
|---|---|---|
| Greenfield Source: | Topsoil | 1 per 200m$^3$ |
| | Subsoil | 1 per 200m$^3$ |
| Brownfield / Remediated Source: | Topsoil | 1 per 150m$^3$ |
| | Subsoil | 1 per 150m$^3$ |
| | General Fill [2] | 1 per 1000m$^3$ |

1. Minimum 3 samples regardless of volume.
2. 'General Fill' is material used primarily to raise levels, specifically not within areas of private gardens, public open space, or soft landscaping e.g., 6F2.

### Acceptability Criteria

Soils intended for use in soft landscaping must be compared to the following acceptability criteria, to confirm their suitability for use:

| Determinand | Acceptability Criteria (mg/kg) |
|---|---|
| Cyanide, Total | 60[2] |
| Cyanide, Free | 60[2] |
| Arsenic (inorganic) | 640 |
| Barium | 22000(2) |
| Beryllium | 12 |
| Cadmium | 190 |
| Chromium | 8600 |
| Chromium (Hexavalent) | 33 |
| Copper | 68000 |
| Lead | 2330(1) |
| Arsenic (inorganic) | 640 |
| Mercury | 58 |
| Nickel | 980 |
| Selenium | 12000 |

| | |
|---|---|
| Vanadium | 9000 |
| Zinc | 730000 |
| | |
| Aliphatic TPH >C5-C6 | 5900 |
| Aliphatic TPH >C6-C8 | 17000 |
| Aliphatic TPH >C8-C10 | 4800 |
| Aliphatic TPH >C10-C12 | 23000 |
| Aliphatic TPH >C12-C16 | 82000 |
| Aliphatic TPH >C16-C35 | 1700000 |
| Aliphatic TPH >C35-C44 | 1700000 |
| | |
| Aromatic TPH >C5-C7 | 110000 |
| Aromatic TPH >C7-C8 | 8100 |
| Aromatic TPH >C8-C10 | 28000 |
| Aromatic TPH >C10-C12 | 37000 |
| Aromatic TPH >C12-C16 | 28000 |
| Aromatic TPH >C16-C21 | 28000 |
| Aromatic TPH >C21-C35 | 28000 |
| Aromatic TPH >C35-C44 | 28000 |
| Aliphatic & Aromatic TPH >C44-C70 | 5900 |
| | |
| PAHs (using Benzo(a)pyrene as a Surrogate Marker) | 77* 1 |

*LQM/CIEH S4ULs for Human Health Risk Assessment (3rd edition, 2015) used unless stated:*
1) *Category 4 Screening Levels (March 2014)*
2) *CL:AIRE Soil GAC for Human Health Assessment (January 2010)*
3) *In-house screening criteria used as no GAC methodology currently exists*
4) *Hazardous waste thresholds. This limit only applies to imported material, not to in-situ soil.*
*Assumed 2.5% SOM for those values dependent upon SOM.*

*The above Surrogate Marker is given based on the following reasoning: Public Health England (PHE) 'Contaminated land information sheet: risk assessment approaches for polycyclic aromatic hydrocarbons (PAHs)' (2017) states that '*PHE currently recommends the use of a surrogate marker approach to assess the risk posed by soil contaminated with the genotoxic polycyclic aromatic hydrocarbons (PAHs)*'. Benzo(a)pyrene (BaP) is used as a surrogate marker to account for a 'complex mixture' of PAHs, which is useful when the exact source(s) of the PAHs cannot be known – such as blended soils in the case of the topsoil. PHE also state that '*we recommend that the ratio of PAHs, relative to BaP, is assessed to ensure the profile is similar to that seen for the test material used in the study by Culp et al*'[1]. PHE do not state that the PAHs in the soil being assessed have to derive from Coal Tar (as was the source of the PAHs in the Culp et al study), it instead explains that as long as the PAH profile in the soil is sufficiently similar to the Culp et al PAH profile, then the use of the surrogate marker is justified. Therefore, it is recommended that the PAH profile of the soil data is compared to that of the Culp et al study before the surrogate marker is used for assessment.

---

[1] Culp et al. (1998), *A comparison of the tumors induced by coal tar and benzo[a]pyrene in a 2-year bioassay*, **Carcinogenesis,** vol.19, no.1, pp.117–124.

### Export of Materials

Any soils to be removed from site must be classified under the definition of waste and chemically tested to determine their destination, i.e. reuse or landfill. Waste ticket records must also be retained as proof of the export of materials from site.

### Stockpile Management

During the course of the development there will be areas of stockpiled soils intended for use within the proposed gardens that will have been approved for use on site. It is imperative that the stockpiles are well managed to avoid inadvertent mixing or depositing of surplus or deleterious materials that would compromise the continued use. We would recommend that the site management reviews the proposed positions for placement of stockpiles and places either fencing or warning signs to ensure compliance.

### Unexpected Contamination

If any visual or olfactory evidence of contamination is encountered during construction work, then the work must be halted, and the Local Authority Environmental Health Officer and Environment Agency should be contacted immediately in order to agree any necessary remediation measures.

### Verification Report

It will be necessary to include in a Verification Report confirming the above cover system validation. The Verification Report is to be submitted to Manchester City Council as part of the discharge of planning conditions.

## 6.0 GEOTECHNICAL CONCLUSIONS

### 6.1 Geotechnical Assessment of Ground Conditions

The site investigation works have revealed that the ground conditions at the site are relatively consistent comprising Made Ground underlain by Glacial Till, underlain by weathered bedrock.

The principal strata identified are outlined in further detail below.

6.1.1 Made Ground

Made Ground was encountered in all exploratory holes undertaken and typically comprised 6F2 (light greyish brown, sandy GRAVEL), underlain by granular Made Ground (dark greyish brown, gravelly SAND with a low cobble content), in places underlain by cohesive Made Ground (firm, dark brownish grey, slightly gravelly, slightly sandy CLAY). The cohesive Made Ground is possibly reworked natural deposits in places. Made Ground was typically recorded to depths of between 0.60m and 1.80m bgl (19.81m – 51.24m AOD), however was noted to be deeper in localised areas, recorded to a maximum depth of 2.60m bgl (49.09m AOD) in WS07.

7 No. standard penetration tests were undertaken within the Made Ground at depths of between 1.00m and 2.00m bgl which recorded uncorrected N-values of between 5 and 30 (average 11) indicating the variability within the density / firmness of the Made Ground.

8 No. hand shear vane tests were undertaken within the cohesive Made Ground which recorded shear strengths of between 30kPa and 90kPa (average 62kPa).

6.1.2 Glacial Till

Glacial Till was encountered in the majority of the exploratory holes, except those where obstructions were recorded within the Made Ground. The Glacial Till was noted to typically comprise firm to stiff, brown, slightly gravelly, slightly sandy CLAY.

Thin to thick granular bands comprising medium dense to very dense, brown SAND were also noted within the Glacial Till in the majority of the exploratory holes, typically encountered between c. 1.60m and c. 3.00m bgl. Given their depths the base of the granular bands were not encountered in the majority of the exploratory holes, however, numerous of the window sample holes were terminated at between 2.45m and 3.45m bgl on refusals (N-value of 50+) c. 300mm – 600mm into the sand bands.

35 No. standard penetration tests were undertaken within the Glacial Till at depths of between 1.00m and 6.50m bgl which recorded uncorrected N-values of between 9 and 50 (average 31) and corrected $N_{60}$ values of between 7 and 58 (average 31). The N-values were noted to increase with depth.

74 No. Hand shear vane tests were undertaken within the Glacial Till recording shear strengths of between 87kPa – 194kPa and an average shear strength of 139kPa, increasing with depth.

Based on Atterberg limit tests undertaken, the Glacial Till is on average of low to moderate plasticity.

### 6.1.3 Weathered Bedrock

Weathered bedrock was only encountered in the 3 No. deep cable percussive boreholes. Bedrock comprised GRAVEL of SANDSTONE and MUDSTONE and was encountered at depths of between 7.50m and 8.00m bgl.

3 No. standard penetration tests were undertaken within the weathered bedrock which all recorded refusals (N value of 50+).

## 6.2 Groundwater

Only a single groundwater strike was recorded during the site investigation works in BH01 at 7.00m bgl, anticipated to be perched water within a granular lens.

## 6.3 Mining / Geological Assessment

Site investigation works to investigate the solid geology were beyond the scope of these works, however, weathered bedrock (Halesowen Formation) was encountered at c. 7.50m – 8.00m bgl on-site.

The site does lie within a Coal Authority Mining Reporting Area, however, no coal outcrops, mine entries, development high risk areas, recorded or probable shallow workings exist on-site. Underground workings are recorded on-site, however, a Coal Authority Mining Report obtained as part of the previous Integra Consulting Phase 1 Geo-Environmental Report (2015) indicated that the workings exist at depth beneath the site, within 4 No. working between 280m – 1080m bgl, last worked in 1957 and any ground movement from these coal workings should have stopped by now.

The site does not lie within the Cheshire Brine Subsidence Compensation District or Consultation Area.

## 6.4 Foundations

Based upon the proposed development plan, existing levels and existing ground conditions, the use of pad foundations is considered feasible, bearing into the firm to stiff Glacial Till at depths of between 1.00m and 2.50m bgl. Foundations should bear at least 200mm into natural Glacial Till achieving a minimum allowable bearing capacities of 50kN/m$^2$ at 1.00m, increasing to a minimum allowable bearing capacity of 130kN/m$^2$ at 2.00m bgl, based on the SPTs, hand shear vane tests and the correlation of Stroud and Butler.

However, it should be noted that Made Ground was recorded to a maximum depth of 2.60m bgl in localised areas (WS07) and granular bands were also recorded, therefore localised deepening will be required in areas.

It is recommended that any localised ‘soft spot’ areas encountered during excavation works should be removed and foundations extended down to suitable formation strata. To minimise issues with potential differential settlement of the foundation structure, it is recommended that foundations are not constructed upon more than one stratum type, as delineated within the exploratory hole logs

Consideration will also be required for the existing piled foundations that remain in-situ in the central site section in relation to their influence upon the proposed foundations. The locations of the piled foundations are noted on the exploratory hole location plan in Appendix 4.

## 6.5 Floor Slabs

Based on existing site levels and the dynamic cone penetrometer tests undertaken, which recorded equivalent CBR values of between 6.7% and 45.8% within the upper 0.50m, it is envisaged that a ground bearing slab bearing on proof rolled Made Ground will be suitable. However, if a high bearing capacity is required for the ground floor slab, utilising ground improvement (i.e. vibro stone columns) may be feasible, subject to consultation with ground improvement specialists.

## 6.6 Earthworks and External Areas

It is anticipated that hard surfaced external works including the access road and pavements may be constructed on proof rolled natural sub grade formations across the site. DCPs indicate that the equivalent CBR value of the existing site materials between ground level and 1.00m bgl are between 4.7% and 94.6%.

The contractor should employ a suitably experienced engineer to be present on site during these earthwork operations to ensure soil suitability, placement, compaction and testing is undertaken in accordance with this specification and to ensure that any unforeseen circumstances, such as adverse weather, do not compromise the earthworks process.

Works should be halted during periods of intermittent or prolonged rainfall to ensure the materials are not placed in a manner that would result in softening of either the formation or the newly placed material. It will be the contractor’s responsibility to determine appropriate weather conditions and determine the suitability of works.

Particular attention must be given to variable weather conditions when re-engineering clay soils as a moisture content fluctuation (2%+/-) of the tolerable limit will result in unacceptable degree of compaction loss.

Where any excavations are to be made i.e. for drainage purposes given the presence of localised deep Made Ground, much of which was generally granular with brick and concrete cobbles, it is considered that all excavations are supported or battered back in accordance with guidance contained in CIRIA R97.

## 6.7 Detailed UXO Risk Assessment Recommendations

As discussed in Section 2.1.1 an updated Detailed Unexploded Ordnance Risk Assessment Report was obtained due to the significant demolition and enabling works undertaken since the Alpla 6 detailed report was undertaken in 2015.

The Detailed UXO Report concluded that the risk of UXO across the majority of the site is Low, with an area in the eastern site section being at Low – Moderate Risk, as per the below plan:

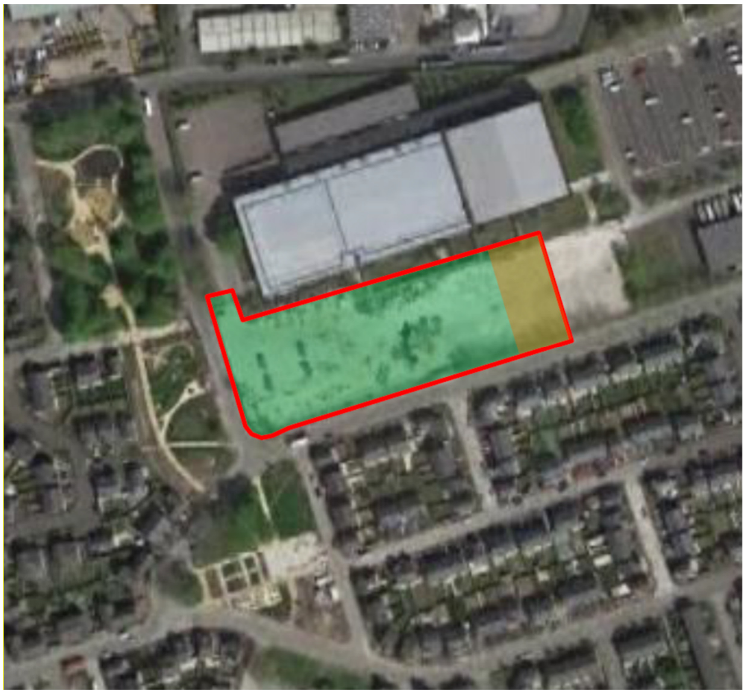


*Figure 2; Plan showing the low risk (green) and low to moderate (yellow) risk zones on-site.*

Consequently, given the low / low – moderate risk, the report recommends that a UXO Safety Awareness Briefing is undertaken prior to all intrusive works coming within both risk zones. The full report is contained in Appendix 14.

## 7.0 CONCLUSIONS

- Based on the site investigation works, the risk to human health and controlled waters is deemed low, however, a **600mm** clean cover system is required across areas of soft landscaping.
- Based on previous ground gas monitoring undertaken and that no additional ground gas sources have been identified, the ground gas risk remains low. in-line with a Characteristic Situation 1 and no ground gas protection measures are deemed necessary.
- A Verification Report will need to be submitted to Manchester City Council confirming the validation of the clean recovery system.
- The conclusions of this report should be agreed with relevant regulatory authorities prior to the commencement of works.

# APPENDIX 1

# LIMITATIONS OF INVESTIGATION WORK AND REPORT

# LIMITATIONS OF INVESTIGATION WORK AND REPORT

## Desk Study References

For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information, it has been assumed that it is correct. No attempt has been made to verify this information. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

The desk study has been produced using historical Ordnance Survey maps and environmental maps available at the time the report has been produced. The environmental information used was the current information available at the time of writing but there is no absolute guarantee of accuracy.

Historical Ordnance Survey maps do not provide a comprehensive description of a site history. They provide details of the site from a date prior to the publication of the map (i.e. a snapshot in time). The period between map editions can be substantial (i.e. several decades). Not all map series are available for every date range in many areas of the UK and therefore there will be gaps in this mapped record for some sites. Potentially contaminative land uses could have been present and removed during such periods and may therefore not form a part of this particular record. In addition, there will be potentially contaminative land uses which are not identified on the map records such as small-scale storage / use of hazardous materials, illegal / unlicensed waste disposal activities etc.

Different map series identify different features utilising different symbols which can result in features that remain on-site being removed from maps. Some features are also not mapped for security reasons (e.g. airfields and other military installations). These areas are mostly shown as blank areas on historical maps.

## Site Walkover

During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.

## Extent of Contamination Studies

This report is strictly limited to the nature of contamination contained within the ground and groundwater at the site. The report does not cover environmental aspects such as air or noise pollution and ground vibrations and the like. In addition, ecological matters relating to wildlife, flora and fauna have not been investigated as part of this report. In particular, the site has not been inspected for the presence or otherwise of invasive species (e.g. Japanese Knotweed). It is recommended that the Client appoints a specialist in this subject to carry out a detailed inspection / survey of the site if its presence is suspected. Where mention has been made to the identification asbestos or asbestos-containing materials this is for indicative purposes only and does not constitute or replace full and proper surveys.

When investigating, or developing, potentially contaminated land it is important to recognise that sub-surface conditions may vary spatially and temporally. The absence of certain ground, ground gas, and contamination or groundwater conditions at the positions tested is not a guarantee that such conditions do not exist anywhere across the site. Due to the presence of existing buildings and structures access could not be obtained to all areas. Additional contamination may be identified following the removal of the buildings or hardstanding.

Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.

The conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the reporting in full. The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the site.

## Flooding

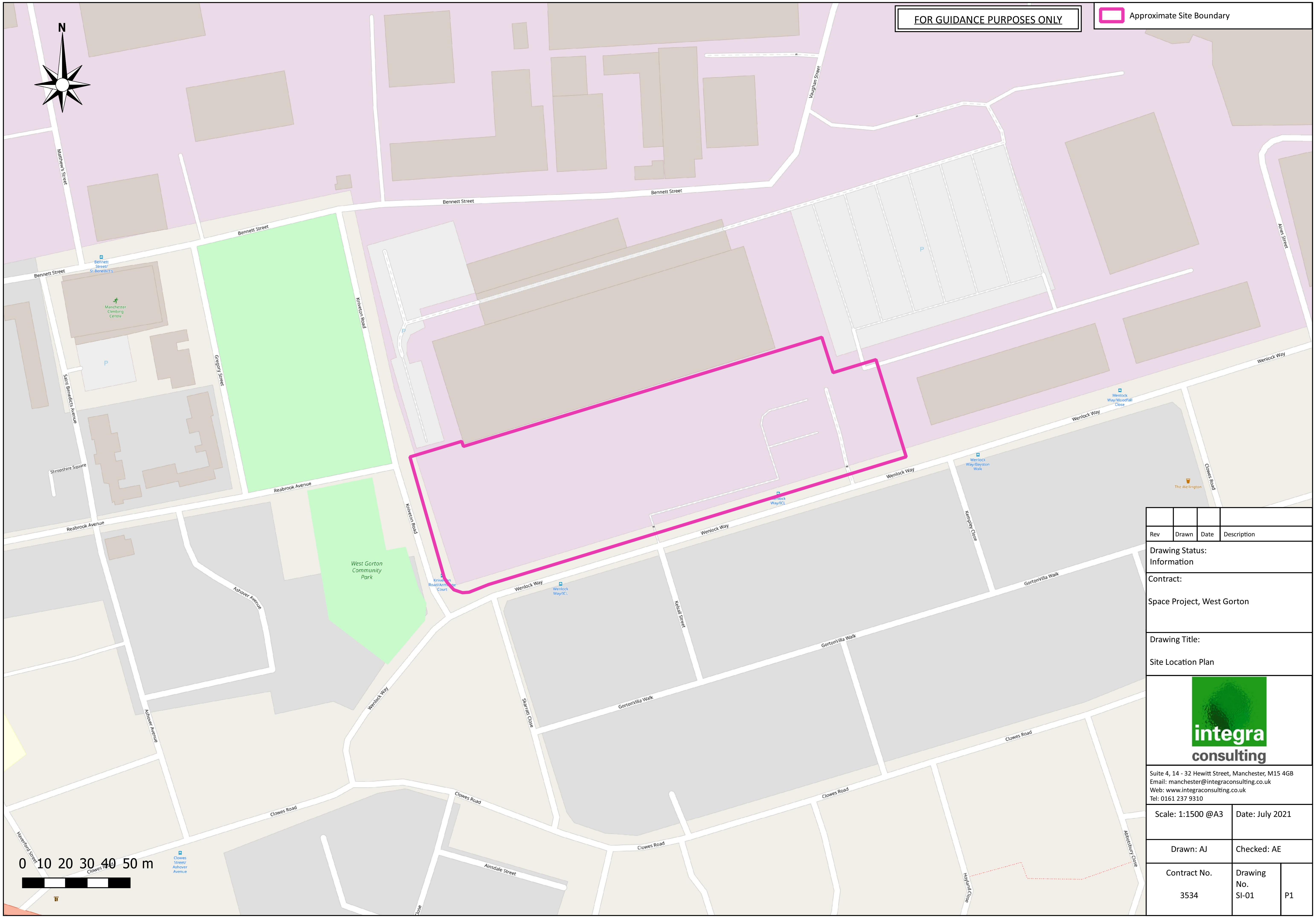
Flooding in this report is defined as flooding caused by the sea, ditches, rivers, streams, ponds, lakes, reservoirs and the like. It does not extend to flooding caused by surcharged piped drainage systems and investigations into flooding of this nature are excluded from this report.

# APPENDIX 2

# SITE LOCATION PLAN

FOR GUIDANCE PURPOSES ONLY

▭ Approximate Site Boundary


N
Matthew's Street
Bennett Street
Bennett Street
Bennett Street
Bennett Street
Vaughan Street
Aines Street
Bennett Street/ St Benedicts
Manchester Climbing Centre
P
P
P
Knireton Road
Gregory Street
Saint Benedicts Avenue
Shropshire Square
Reabrook Avenue
Reabrook Avenue
West Gorton Community Park
Kniveton Road
Kniveton Road/Armitage Court
Wenlock Way
Wenlock Way/ICL
Wenlock Way/ICL
Wenlock Way
Wenlock Way
Wenlock Way/Bayston Walk
Wenlock Way
Wenlock Way/Woodfall Close
Wenlock Way
Wenlock Way
Kempley Close
Clowes Road
The Wellington
Ashover Avenue
Ashover Avenue
Kelsall Street
GortonVilla Walk
GortonVilla Walk
GortonVilla Walk
Skarratt Close
Clowes Road
Clowes Road
Clowes Road
Clowes Road
Clowes Road
Ainsdale Street
Haverford Street
Clowes Street/ Ashover Avenue
Hoyland Close
Abbotsbury Close
Close
0 10 20 30 40 50 m

| Rev | Drawn | Date | Description |
|---|---|---|---|
|  |  |  |  |

Drawing Status:
Information

Contract:

Space Project, West Gorton

Drawing Title:

Site Location Plan

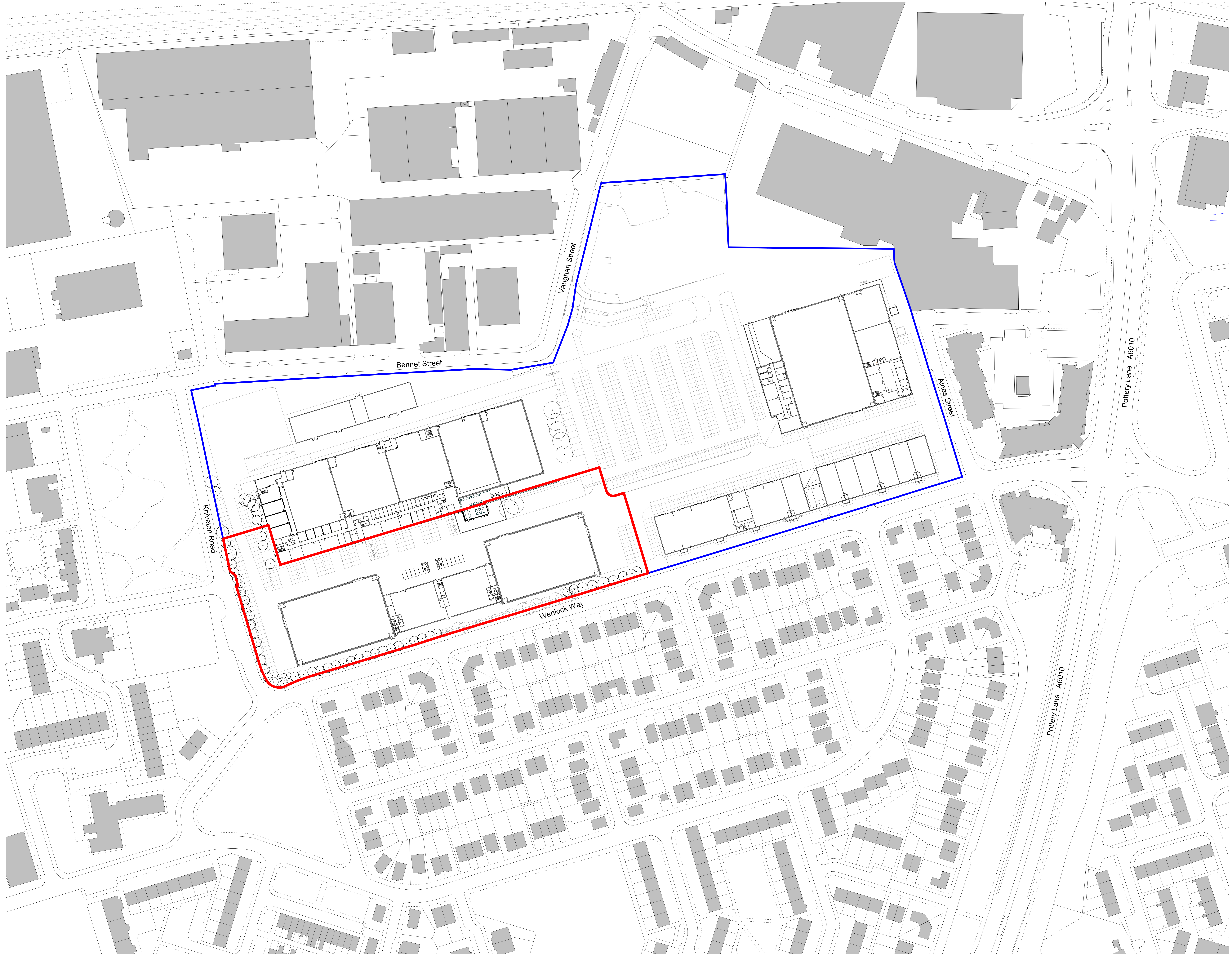
integra consulting

Suite 4, 14 - 32 Hewitt Street, Manchester, M15 4GB
Email: manchester@integraconsulting.co.uk
Web: www.integraconsulting.co.uk
Tel: 0161 237 9310

Scale: 1:1500 @A3
Date: July 2021
Drawn: AJ
Checked: AE
Contract No. 3534
Drawing No. SI-01
P1

# APPENDIX 3

# PROPOSED DEVELOPMENT PLAN



The contractor is responsible for checking dimensions, tolerances and references. Any discrepancy to be verified with the Architect before proceeding with the works. Where an item is covered by drawings to different scales the larger scale drawing is to be worked to.

Do not scale drawing. Figured dimensions to be worked to in all cases.

Where products have been specified, PRP have reviewed applicable products available in the UK at the time of writing the specification, from which products named in the specification have been selected.

Where the contractor wishes to propose alternative products, representative samples and a full technical appraisal should be submitted by the contractor to the employer demonstrating that their proposed alternative has equal or better performance.

Any alternative products are subject to design team, building control, warranty provider and employer acceptance.

CDM REGULATIONS 2015. All current drawings and specifications for the project must be read in conjunction with the Designer's Hazard and Environment Assessment Record

All intellectual property rights reserved.

**NOTES**

The below items listed below are outstounding:

- Bicycle Storage
- Waste Management
- Car Parking Options outside of planning red line boundary
- Confirmation on the affordability to reception area options

**KEY**

🟥 Site Boundary
🟦 Ownershitp Boundary

| Rev | Date | Description | Dwn | Ckd |
|---|---|---|---|---|
| A | 06.07.21 | General Updates | VP | JH |
| - | 17.06.21 | First Issue | VP | JH |

**SPACE STUDIOS, MANCHESTER**

PROPOSED SITE PLAN - GROUND FLOOR LEVEL

| Project | Origin | Zone | Level | Type | Role | Number |
|---|---|---|---|---|---|---|
| **SPC -** | **PRP -** | **ZZZ -** | **GF -** | **DR -** | **A -** | **002102** |

Revision
A

Status
RIBA STAGE 2

Drawn VP Checked JH Date JUNE 2021 Scale @ A1 1 : 1000

PRP
prp-co.uk
Manchester
0161 242 8950

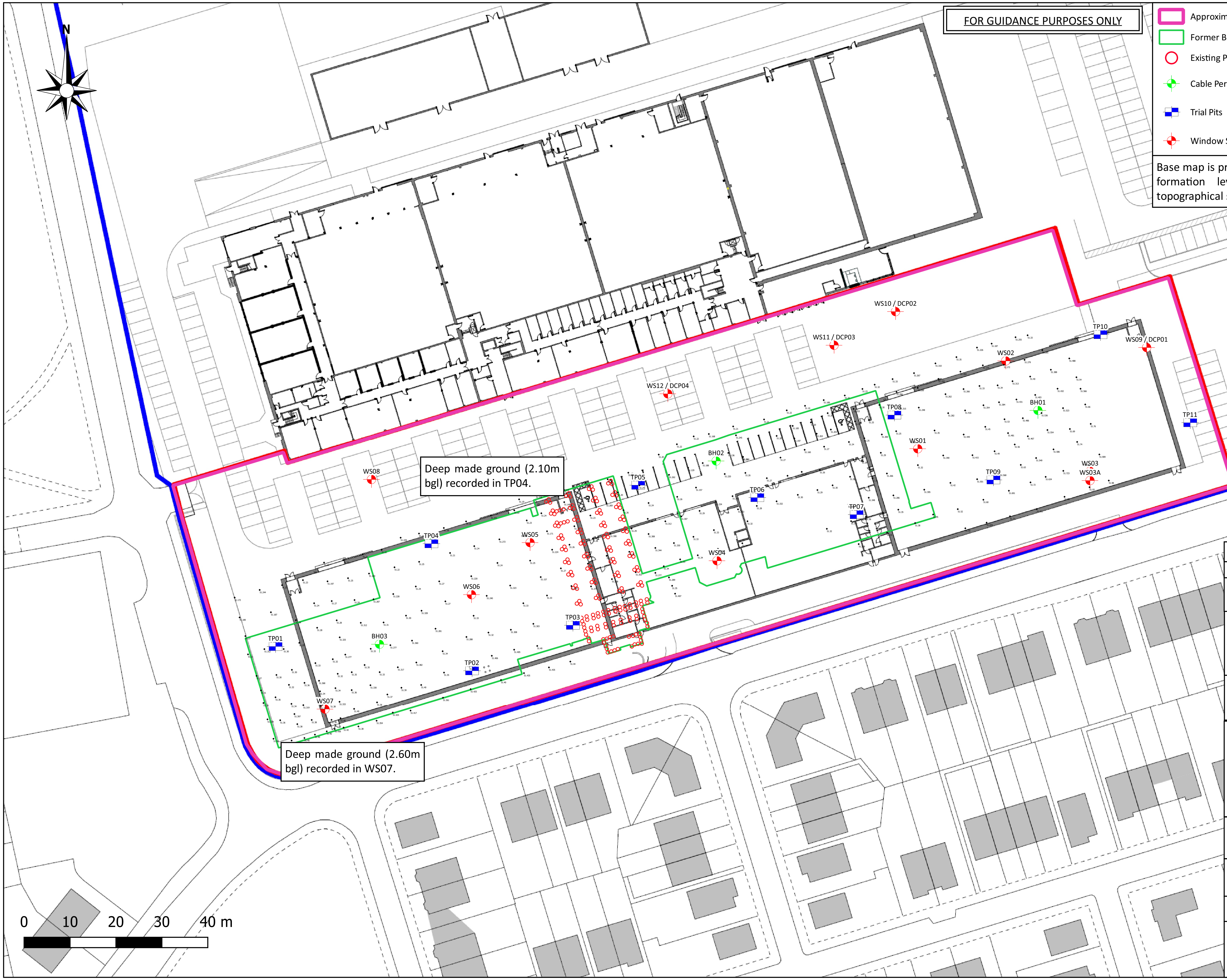
# APPENDIX 4

# EXPLORATORY HOLE LOCATION PLAN

FOR GUIDANCE PURPOSES ONLY

🟪 Approximate Site Boundary
🟩 Former Building Envelope
○ Existing Piles
⊕ Cable Percussive Boreholes
▨ Trial Pits
⊕ Window Sample / Dynamic Cone Penetrometer Holes

Base map is proposed layout and post demolition formation levels (no post demolition full topographical survey available)


N
WS10 / DCP02
WS11 / DCP03
TP10
WS09 / DCP01
WS02
WS12 / DCP04
TP08
BH01
TP11
WS01
BH02
WS03
WS03A
WS08
TP05
TP09
TP06
TP07
TP04
WS05
WS04
WS06
TP03
BH03
TP01
TP02
WS07
0
10
20
30
40 m

Deep made ground (2.10m bgl) recorded in TP04.

Deep made ground (2.60m bgl) recorded in WS07.

| Rev | Drawn | Date | Description |
|---|---|---|---|
| | | | |

Drawing Status:
Information

Contract:
Space Project, West Gorton

Drawing Title:
Exploratory Hole Location Plan

integra consulting

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Tel: 0161 237 9310

| | |
|---|---|
| Scale: 1:750 @A3 | Date: July 2021 |
| Drawn: AJ | Checked: AE |
| Contract No.<br>3534 | Drawing No.<br>SI-01 P1 |

# APPENDIX 5

# WINDOW SAMPLE HOLE LOGS AND PHOTOGRAPHS

IGE consulting

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web: www.igeconsulting.co.uk

# Window Sample Log

ver. 1.5

Window Sample No.
**WS01**
Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| Project Name: | Phase 3, Space Project | Co-ords: | 386858E - 396919N | Project No.<br>3534 |
| Location: | West Gorton | Level (m AOD): | 51.46 | Logged By<br>LM |
| | | Date: | 24/06/2021 | |
| Client: | Manchester City Council | Weather: | Overcast | Checked By<br>AJ |

| Well / Backfill | Water Strikes | Sample and In Situ Testing Depth(m) | Type | Results | Depth (m) | Level (m AOD) | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | 0.10 | 51.36 | Light grey, slightly gravelly, fine to coarse SAND. Gravel is angular to subangular, fine to medium of limestone and concrete.<br>MADE GROUND |
| | | 0.25 | ES | | | | |
| | | | | | 0.40 | 51.06 | Dark brownish grey, slightly gravelly, fine to coarse SAND. Gravel is aubangular to subrounded, fine to coarse of limestone, concrete, brick fragments and plastic.<br>MADE GROUND |
| | | | | | 0.65 | 50.81 | Firm, light greyish brown, slightly gravelly, slightly sandy CLAY. Gravel is subangular to subrounded, fine to medium of mudstone, sandstone, coal and brick fragments.<br>MADE GROUND |
| | | 0.80 | | HVP=96 | | | |
| | | 1.00 | SPT | N=14 (1,3/3,3,4,4) | | | |
| | | 1.80 | | HVP=134 | | | |
| | | 2.00 | SPT | 48 (5,7/48 for 170mm) | | | |
| | | | | | 2.45 | 49.01 | Firm to stiff, dark brown, mottled light orangish brown grey, slightly gravelly, slightly sandy CLAY. Gravel is subangular to rounded, fine to medium of mudstone and sandstone.<br>GLACIAL TILL<br>*Unknown obstruction at 0.75m bgl.* |
| | | | | | | | Window Sample terminated at 2.45m. |

Remarks:

Window sample terminated at 2.45m bgl due to refusal.

Hand dug pit undertaken to 1.00m bgl.

| Water Strike | | Casing Details | | Sample Sleeve Runs | | |
|---|---|---|---|---|---|---|
| Depth Strike | Remarks | Depth Base | Diameter | Depth Top (m) | Depth Base (m) | Diameter (mm) |
| | No strike | | | 1.00 | 2.00 | 87 |

# Window Sample Photos

**WS01**

Phase 3, Space Project

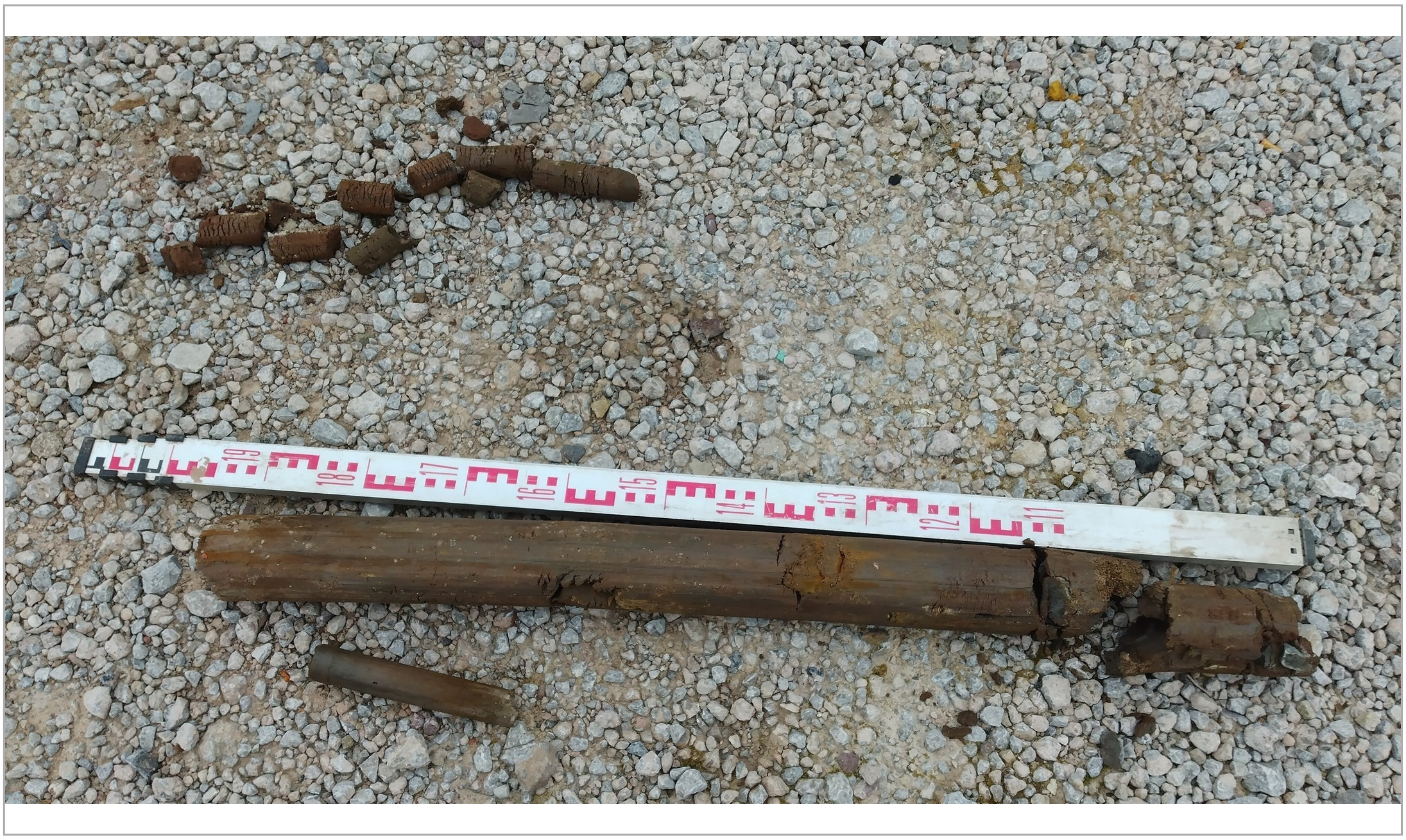


**Image 1.** WS01:
*View from right to left, top to bottom.*

*1.00m - 2.00m*

# Window Sample Log

ver. 1.5

Window Sample No.
**WS02**
Sheet 1 of 1

| | | | |
|---|---|---|---|
| Project Name: | Phase 3, Space Project | Co-ords: | 386877E - 396939N |
| | | Level (m AOD): | 51.76 |
| Location: | West Gorton | Date: | 24/06/2021 |
| Client: | Manchester City Council | Weather: | Overcast |

Project No. 3534
Logged By LM
Checked By AJ

| Well / Backfill | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m AOD) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth(m) | Type | Results | | | | |
| | | | | | 0.10 | 51.66 | | Light grey, slightly gravelly, fine to coarse SAND. Gravel is angular to subangular, fine to medium of limestone and concrete.<br>MADE GROUND |
| | | 0.50 | ES | | 0.60 | 51.16 | | Dark brownish grey, slightly gravelly, fine to coarse SAND. Gravel is aubangular to subrounded, fine to coarse of limestone, concrete, brick fragments and plastic.<br>MADE GROUND |
| | | 0.75 | ES | | 0.85 | 50.91 | | Firm, light orangish brown, mottled grey, slightly gravelly, slightly sandy CLAY. Gravel is subangular to subrounded, fine to coarse of brick and coal.<br>MADE GROUND<br>*Unknown obstruction at 0.75m bgl.* |
| | | 1.00<br>1.00<br>2.00<br>2.00 | <br>SPT<br><br>SPT | HVP=114<br>N=11 (2,3/3,2,3,3)<br>HVP=132<br>N=34 (4,5/7,7,10,10) | 2.45 | 49.31 | | Stiff, dark brown, mottled light orangish brown and grey, slightly gravelly, slightly sandy CLAY. Gravel is subangular to rounded, fine to medium of mudstone and sandstone.<br>GLACIAL TILL |
| | | 2.60 | SPT | 50 (6,18/50 for 150mm) | 3.05 | 48.71 | | Very dense, light orangish brown, very silty, fine to medium SAND.<br>GLACIAL TILL |

Window Sample terminated at 3.05m.

Remarks:

Window sample terminated at 3.05m bgl due to refusal.

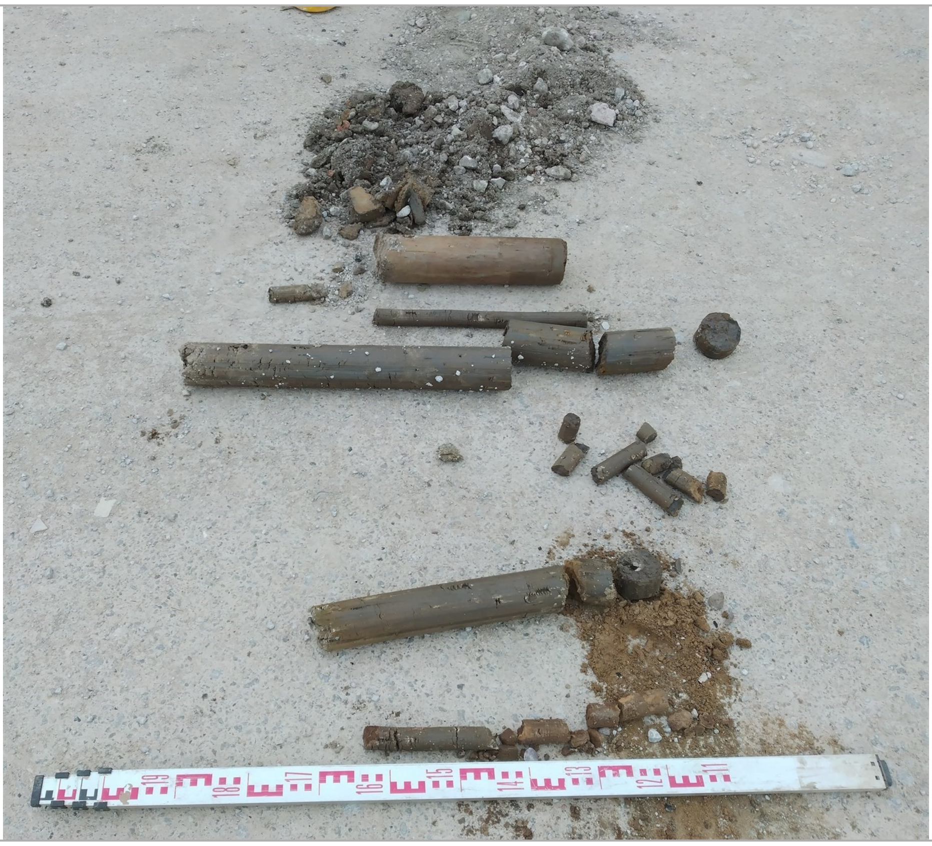
Hand dug pit undertaken to 1.00m bgl.

| Water Strike | | Casing Details | | Sample Sleeve Runs | | |
|---|---|---|---|---|---|---|
| Depth Strike | Remarks | Depth Base | Diameter | Depth Top (m) | Depth Base (m) | Diameter (mm) |
| | No strike | | | 1.00 | 2.00 | 87 |
| | | | | 2.00 | 2.60 | 77 |

# Window Sample Photos

**WS02**

Phase 3, Space Project



19
18
17
16
15
14
13
12
11

**Image 1.** WS02:
*View from right to left, top to bottom.*

*0.00m - 1.00m*
*1.00m - 2.00m*
*2.00m - 2.60m*

Suite 4, 14-32 Hewitt St. Manchester, M15 4GB
email: contact@igeconsulting.co.uk
web: www.igeconsulting.co.uk

# Window Sample Log

ver. 1.5

Window Sample No.

**WS03**

Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| Project Name: | Phase 3, Space Project | Co-ords: | 386896E - 396915N | Project No.<br>3534 |
| Location: | West Gorton | Level (m AOD): | 52.15 | Logged By<br>LM |
| | | Date: | 24/06/2021 | |
| Client: | Manchester City Council | Weather: | Overcast | Checked By<br>AJ |

| Well / Backfill | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m AOD) | | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth(m) | Type | Results | | | | |
| ▨ | | | | | 0.10 | 52.05 | ▨ | Light grey, slightly gravelly, fine to coarse SAND. Gravel is angular to subangular, fine to medium of limestone and concrete.<br>MADE GROUND |
| ▨ | | | | | 0.40 | 51.75 | ▨ | Dark brownish grey, slightly gravelly, fine to coarse SAND. Gravel is aubangular to subrounded, fine to coarse of limestone, concrete, brick fragments and plastic.<br>MADE GROUND |
| ▨ | | | | | 0.75 | 51.40 | ▨ | Dark reddish brown, slightly gravelly, fine to coarse, ashy SAND. Gravel is angular to subangular, fine to coarse of clinker, whole bricks and brick fragments.<br>MADE GROUND |
| | | | | | | | | Window Sample terminated at 0.75m. |

Remarks:

Window sample terminated at 0.75m bgl due to obstruction.

Hand dug pit undertaken to 1.00m bgl.

| Water Strike | | Casing Details | | Sample Sleeve Runs | | |
|---|---|---|---|---|---|---|
| Depth Strike | Remarks | Depth Base | Diameter | Depth Top (m) | Depth Base (m) | Diameter (mm) |
| | No strike | | | | | |

| # Window Sample Photos | **WS03** |
|---|---|
| | Phase 3, Space Project |

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# Window Sample Log

ver. 1.5

Window Sample No.

**WS03A**

Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Phase 3, Space Project | Co-ords: | 386896E - 396913N | Project No. | 3534 |
| Location: | West Gorton | Level (m AOD): | 52.15 | Logged By | LM |
| | | Date: | 24/06/2021 | | |
| Client: | Manchester City Council | Weather: | Overcast | Checked By | AJ |

| Well / Backfill | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m AOD) | | Stratum Description | |
|---|---|---|---|---|---|---|---|---|---|
| | | Depth(m) | Type | Results | | | | | |
| ▨ | | | | | 0.10 | 52.05 | ▨ | Light grey, slightly gravelly, fine to coarse SAND. Gravel is angular to subangular, fine to medium of limestone and concrete.<br>MADE GROUND | |
| ▨ | | | | | 0.40 | 51.75 | ▨ | Dark brownish grey, slightly gravelly, fine to coarse SAND. Gravel is aubangular to subrounded, fine to coarse of limestone, concrete, brick fragments and plastic.<br>MADE GROUND | |
| ▨ | | | | | 0.75 | 51.40 | ▨ | Dark reddish brown, slightly gravelly, fine to coarse, ashy SAND. Gravel is angular to subangular, fine to coarse of clinker, whole bricks and brick fragments.<br>MADE GROUND | |
| | | | | | | | | Window Sample terminated at 0.75m. | |
| | | | | | | | | | 1 |
| | | | | | | | | | 2 |
| | | | | | | | | | 3 |
| | | | | | | | | | 4 |
| | | | | | | | | | 5 |

Remarks:

Window sample terminated at 0.75m bgl due to obstruction.

Hand dug pit undertaken to 1.00m bgl.

| Water Strike | | Casing Details | | Sample Sleeve Runs | | |
|---|---|---|---|---|---|---|
| Depth Strike | Remarks | Depth Base | Diameter | Depth Top (m) | Depth Base (m) | Diameter (mm) |
| | No strike | | | | | |

# Window Sample Photos

**WS03A**

Phase 3, Space Project

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# Window Sample Log

ver. 1.5

Window Sample No.
**WS04**
Sheet 1 of 1

| | | | |
|---|---|---|---|
| Project Name: | Phase 3, Space Project | Co-ords: | 386813E - 396895N |
| Location: | West Gorton | Level (m AOD): | 51.81 |
| Client: | Manchester City Council | Date: | 24/06/2021 |
| | | Weather: | Overcast |

| | |
|---|---|
| Project No. | 3534 |
| Logged By | LM |
| Checked By | AJ |

| Well / Backfill | Water Strikes | Sample and In Situ Testing Depth(m) | Type | Results | Depth (m) | Level (m AOD) | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | | | Light grey, sandy, silty, angular to subangular, fine to coarse GRAVEL of limestone and concrete.<br>MADE GROUND |
| | | | | | 0.10 | 51.71 | Dark brown, gravelly, silty, fine to coarse SAND. Gravel is angular to subangular, fine to coarse of concrete, limestone, clinker, coal and brick fragments.<br>MADE GROUND |
| | | 0.45 | ES | | | | |
| | | | | | 0.60 | 51.21 | Firm, dark greyish brown, mottled black, slightly gravelly, sandy CLAY. Gravel is angular to subrounded of fine to coarse concrete, brick fragments, clinker, mudstone, sandstone and coal.<br>MADE GROUND |
| | | 0.65 | ES | | | | |
| | | | | | 0.85 | 50.96 | Firm to stiff, dark brown, mottled light grey, slightly gravelly, slightly sandy CLAY. Gravel is angular to subrounded, fine to medium of mudstone, sandstone and coal.<br>GLACIAL TILL |
| | | 1.00 | SPT | N=12 (2,2/3,3,3,3) | | | |
| | | 1.20 | D | | | | |
| | | 1.50 | | HVP=124 | | | |
| | | | | | 1.85 | 49.96 | Very dense, light orangish brown, silty, fine to medium SAND.<br>GLACIAL TILL |
| | | 2.00 | SPT | N=50 (6,9/50 for 230mm) | | | |
| | | | | | 2.45 | 49.36 | Window Sample terminated at 2.45m. |

Remarks:

Window sample terminated at 2.45m bgl due to refusal.

Hand dug pit undertaken to 1.00m bgl.

| Water Strike | | Casing Details | | Sample Sleeve Runs | | |
|---|---|---|---|---|---|---|
| Depth Strike | Remarks | Depth Base | Diameter | Depth Top (m) | Depth Base (m) | Diameter (mm) |
| | No strike | | | 1.00 | 2.00 | 87 |

# Window Sample Photos

**WS04**

Phase 3, Space Project

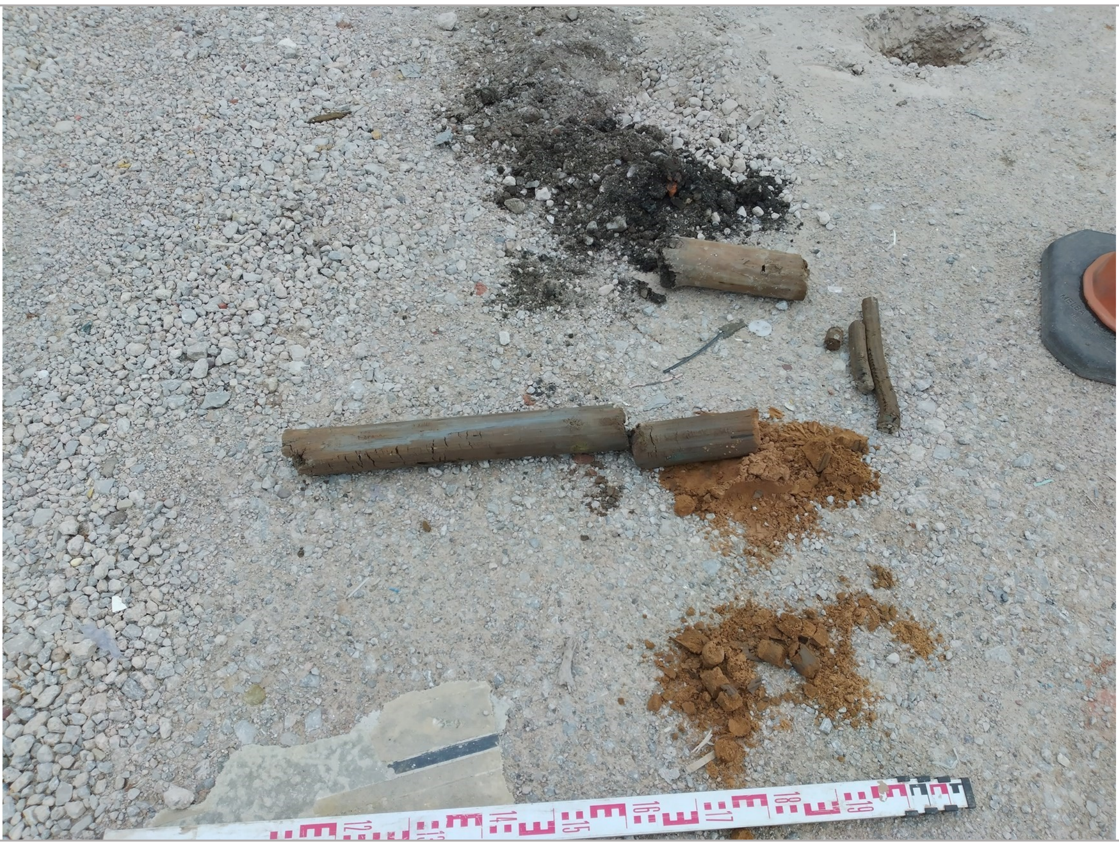
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**Image 1.** WS04:
*View from left to right, top to bottom.*

*0.00m - 1.00m*
*1.00m - 2.00m*

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# Window Sample Log

ver. 1.5

Window Sample No.

**WS05**

Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Phase 3, Space Project | Co-ords: | 386774E - 396899N | Project No. | 3534 |
| Location: | West Gorton | Level (m AOD): | 51.53 | Logged By | LM |
| | | Date: | 24/06/2021 | | |
| Client: | Manchester City Council | Weather: | Overcast | Checked By | AJ |

| Well / Backfill | Water Strikes | Sample and In Situ Testing Depth(m) | Type | Results | Depth (m) | Level (m AOD) | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | | | Light grey, sandy, silty, angular to subangular, fine to coarse GRAVEL of limestone and concrete.<br>MADE GROUND |
| | | 0.30 | ES | | 0.15 | 51.38 | Dark brown, gravelly, silty, fine to coarse SAND. Gravel is angular to subangular, fine to coarse of concrete, limestone, clinker, coal and brick fragments.<br>MADE GROUND |
| | | 0.60 | ES | | 0.45 | 51.08 | Firm, dark greyish brown, mottled black, slightly gravelly, sandy CLAY. Gravel is angular to subrounded of fine to coarse concrete, brick fragments, clinker, mudstone, sandstone and coal.<br>MADE GROUND |
| | | 1.00<br>1.20 | SPT | N=19 (2,3/3,2,3,11)<br>HVP=130 | 0.70 | 50.83 | Stiff, dark brown, mottled light grey, slightly gravelly, slightly sandy CLAY. Gravel is angular to subrounded, fine to medium of mudstone, sandstone and coal.<br>GLACIAL TILL |
| | | | | | 1.70 | 49.83 | Window Sample terminated at 1.70m. |

Remarks:

Window sample terminated at 1.70m bgl due to obstruction on suspected cobble.

Hand dug pit undertaken to 1.00m bgl.

| Water Strike | | Casing Details | | Sample Sleeve Runs | | |
|---|---|---|---|---|---|---|
| Depth Strike | Remarks | Depth Base | Diameter | Depth Top (m) | Depth Base (m) | Diameter (mm) |
| | No strike | | | 1.00 | 1.70 | 87 |

# Window Sample Photos

**WS05**

Phase 3, Space Project

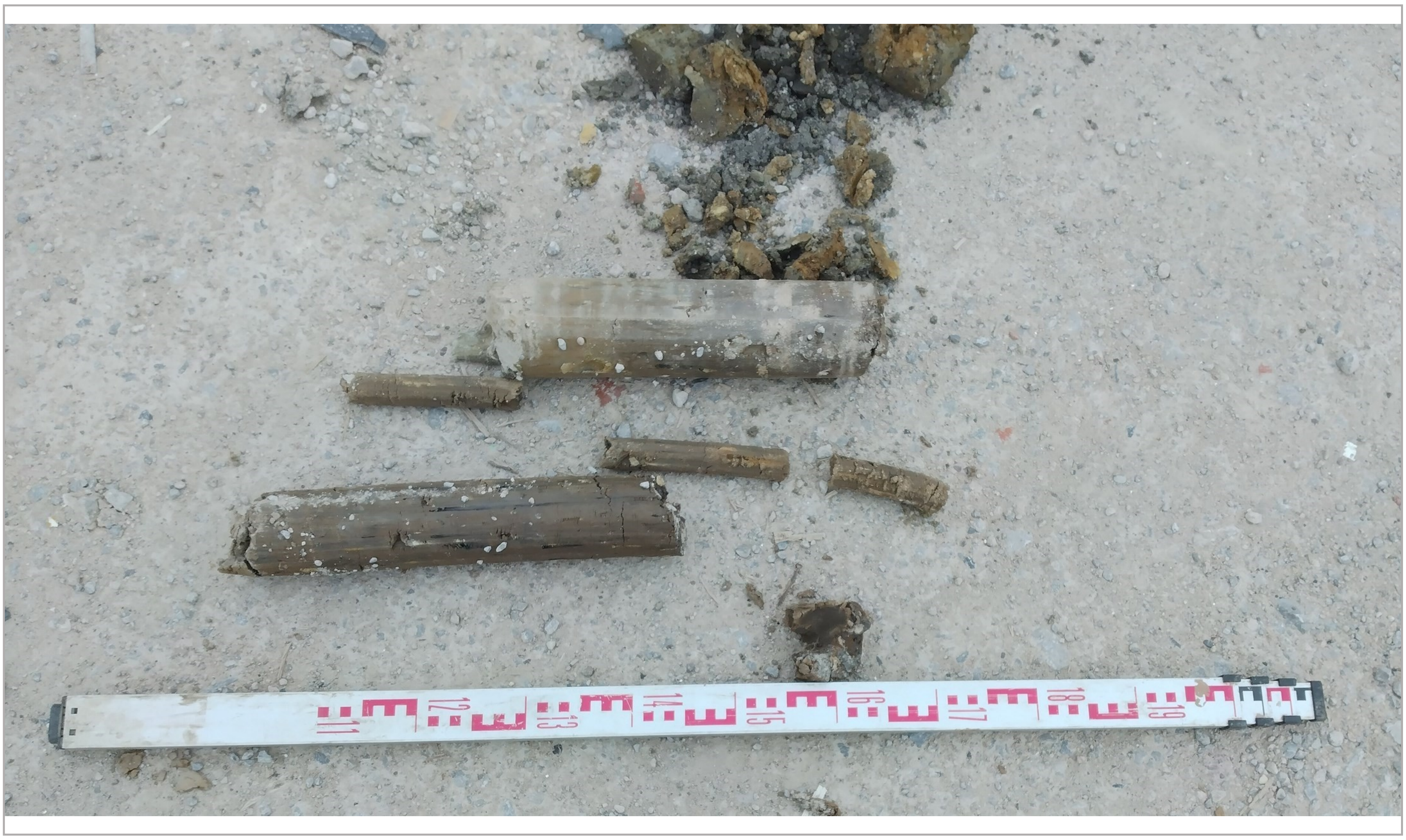
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**Image 1.** WS05:
*View from left to right, top to bottom.*

*0.00m - 1.00m*
*1.00m - 1.70m*

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# Window Sample Log

ver. 1.5

Window Sample No.

**WS06**

Sheet 1 of 1

| | | | |
|---|---|---|---|
| Project Name: | Phase 3, Space Project | Co-ords: | 386761E - 396888N |
| | | Level (m AOD): | 51.60 |
| Location: | West Gorton | Date: | 24/06/2021 |
| Client: | Manchester City Council | Weather: | Overcast |

Project No. 3534

Logged By LM

Checked By AJ

| Sample Depth(m) | Type | Results | Depth (m) | Level (m AOD) | Stratum Description |
|---|---|---|---|---|---|
| | | | 0.10 | 51.50 | Light grey, sandy, silty, angular to subangular, fine to coarse GRAVEL of limestone and concrete.<br>MADE GROUND |
| 0.50 | ES | | 0.60 | 51.00 | Dark brown, gravelly, silty, fine to coarse SAND. Gravel is angular to subangular, fine to coarse of concrete, limestone, clinker, coal and brick fragments.<br>MADE GROUND |
| 1.00<br>1.00 | ES<br>SPT | N=16 (6,7/4,5,4,3) | 1.40 | 50.20 | Medium dense, dark brown, mottled black and red, gravelly, silty, fine to coarse ashy SAND. Gravel is angular to subangular, fine to coarse of concrete, brick fragments, coal, clinker, ashphalt and timber.<br>MADE GROUND<br>*Bituminous odour from 0.90m to 1.35m bgl.* |
| 1.50<br>1.50 | D | HVP=102 | 2.00 | 49.60 | Stiff, dark brown, mottled light grey, slightly gravelly, slightly sandy CLAY. gravel is angular to subangular, fine to medium of mudstone and sandstone.<br>GLACIAL TILL<br>*Hole terminated by UXO engineer at 2.00m bgl.* |

Window Sample terminated at 2.00m.

Remarks:

Window sample terminated at 2.00m bgl by UXO engineer.

Hand dug pit undertaken to 1.00m bgl.

| Water Strike | | Casing Details | | Sample Sleeve Runs | | |
|---|---|---|---|---|---|---|
| Depth Strike | Remarks | Depth Base | Diameter | Depth Top (m) | Depth Base (m) | Diameter (mm) |
| | No strike | | | 1.00 | 2.00 | 87 |

# Window Sample Photos

**WS06**

Phase 3, Space Project

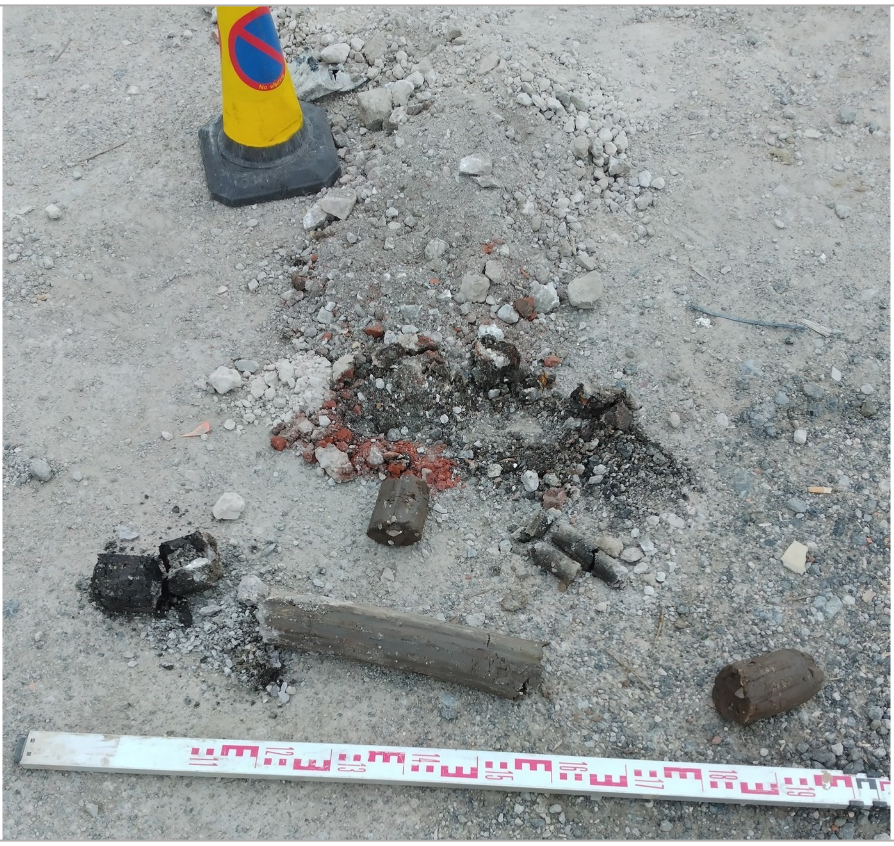

**Image 1.** WS06:
*View from left to right, top to bottom.*

*0.00m - 1.00m*
*1.00m - 2.00m*

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# Window Sample Log

ver. 1.5

Window Sample No.
**WS07**
Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| Project Name: | Phase 3, Space Project | Co-ords: | 386729E - 396863N | Project No.<br>3534 |
| Location: | West Gorton | Level (m AOD): | 51.69 | Logged By<br>LM |
| | | Date: | 24/06/2021 | |
| Client: | Manchester City Council | Weather: | Overcast | Checked By<br>AJ |

| Well / Backfill | Water Strikes | Sample and In Situ Testing Depth(m) | Type | Results | Depth (m) | Level (m AOD) | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | 0.10 | 51.59 | Light grey, sandy, silty, angular to subangular, fine to coarse GRAVEL of limestone and concrete.<br>MADE GROUND |
| | | 0.20 | ES | | 0.70 | 50.99 | Dark brown, gravelly, silty, fine to coarse SAND. Gravel is angular to subangular, fine to coarse of concrete, limestone, clinker, coal and brick fragments.<br>MADE GROUND |
| | | 1.00<br>1.10 | SPT<br>ES | N=7 (2,2/2,2,1,2) | 1.40 | 50.29 | Firm, dark greyish brown, mottled black, slightly gravelly, sandy CLAY. Gravel is angular to subrounded of fine to coarse concrete, brick fragments, clinker, mudstone, sandstone and coal.<br>MADE GROUND |
| | | 1.50<br>2.00 | <br>SPT | HVP=70<br>N=6 (0,0/1,1,2,2) | 2.10 | 49.59 | Firm, light orangish brown, mottled light grey, slightly gravelly, slightly sandy CLAY. Gravel is subangular to subrounded of fine to medium mudstone, sandstone and coal.<br>SUSPECTED REWORKED NATURAL DEPOSITS |
| | | 2.50 | | HVP=30 | 2.60 | 49.09 | Soft, light grey, mottled dark brown, slightly sandy CLAY. Mild organic odour.<br>SUSPECTED REWORKED NATURAL DEPOSITS |
| | | 2.80 | D | | 2.90 | 48.79 | Stiff, dark brown, mottled light grey, slightly gravelly, slightly sandy CLAY. gravel is angular to subangular, fine to medium of mudstone and sandstone.<br>GLACIAL TILL |
| | | 3.00 | SPT | N=50 (25 for 135mm/50 for 240mm) | 3.05 | 48.64 | Light orangish brown, silty, fine to medium SAND.<br>GLACIAL TILL |
| | | | | | 3.45 | 48.24 | Stiff, dark brown, mottled light grey, slightly gravelly, slightly sandy CLAY. gravel is angular to subangular, fine to medium of mudstone and sandstone.<br>GLACIAL TILL |

Window Sample terminated at 3.45m.

1
2
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Remarks:

Window sample terminated at 3.45m bgl due to refusal.

Hand dug pit undertaken to 1.00m bgl.

| Water Strike | | Casing Details | | Sample Sleeve Runs | | |
|---|---|---|---|---|---|---|
| Depth Strike | Remarks | Depth Base | Diameter | Depth Top (m) | Depth Base (m) | Diameter (mm) |
| | No strike | | | 1.00 | 2.00 | 87 |
| | | | | 2.00 | 3.00 | 77 |

# Window Sample Photos

**WS07**

Phase 3, Space Project

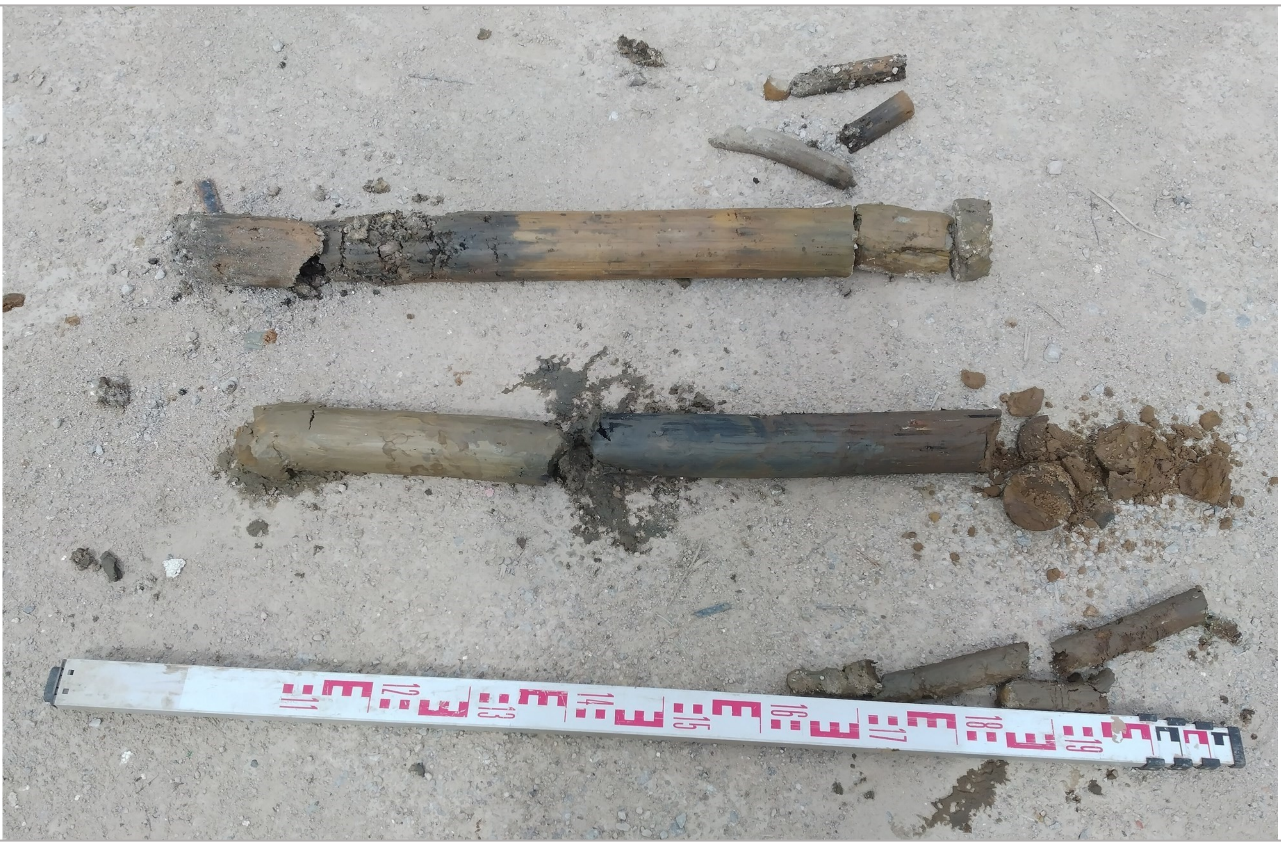

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**Image 1.** WS07:
*View from left to right, top to bottom.*

*1.00m - 2.00m*
*2.00m - 3.00m*

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# Window Sample Log

ver. 1.5

Window Sample No.

**WS08**

Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| Project Name: | Phase 3, Space Project | Co-ords: | 386739E - 396941N | Project No.<br>3534 |
| Location: | West Gorton | Level (m AOD): | 52.56 | Logged By<br>JH |
| | | Date: | 25/06/2021 | |
| Client: | Manchester City Council | Weather: | Showers | Checked By<br>AJ |

| Well / Backfill | Water Strikes | Sample and In Situ Testing: Depth(m) | Type | Results | Depth (m) | Level (m AOD) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| ▨ | | | | | | | ▨ | Light grey, sandy, angular to subangular, fine to coarse GRAVEL of limestone and concrete.<br>MADE GROUND |
| ▨ | | 0.30 | ES | | | | ▨ | |
| ▨ | | 1.00 | SPT | N=10<br>(10,8/3,2,2,3) | | | ▨ | |
| ▨ | | | | | 1.20 | 51.36 | | Stiff, brown, mottled grey, slightly gravelly CLAY. Gravel is subrounded to well rounded, fine to coarse mixed lithologies.<br>GLACIAL TILL |
| ▨ | | 1.50 | | HVP=104 | | | | |
| ▨ | | 1.60 | | HVP=97 | | | | |
| ▨ | | 1.70 | | HVP=89 | | | | |
| ▨ | | 1.80 | B | | | | | |
| ▨ | | 1.80 | | HVP=151 | | | | |
| ▨ | | 1.90 | | HVP=153 | | | | |
| ▨ | | 2.00 | SPT | 50 (6,10/50 for 260mm) | | | | |
| | | | | | 2.45 | 50.11 | | Window Sample terminated at 2.45m. |

Remarks:

Window sample terminated at 2.45m bgl due to refusal.

Hand dug pit undertaken to 1.00m bgl.

| Water Strike: Depth Strike | Water Strike: Remarks | Casing Details: Depth Base | Casing Details: Diameter | Sample Sleeve Runs: Depth Top (m) | Sample Sleeve Runs: Depth Base (m) | Sample Sleeve Runs: Diameter (mm) |
|---|---|---|---|---|---|---|
| | No strike | | | 1.00 | 2.00 | 87 |

| Window Sample Photos | **WS08** |
|---|---|
| | Phase 3, Space Project |

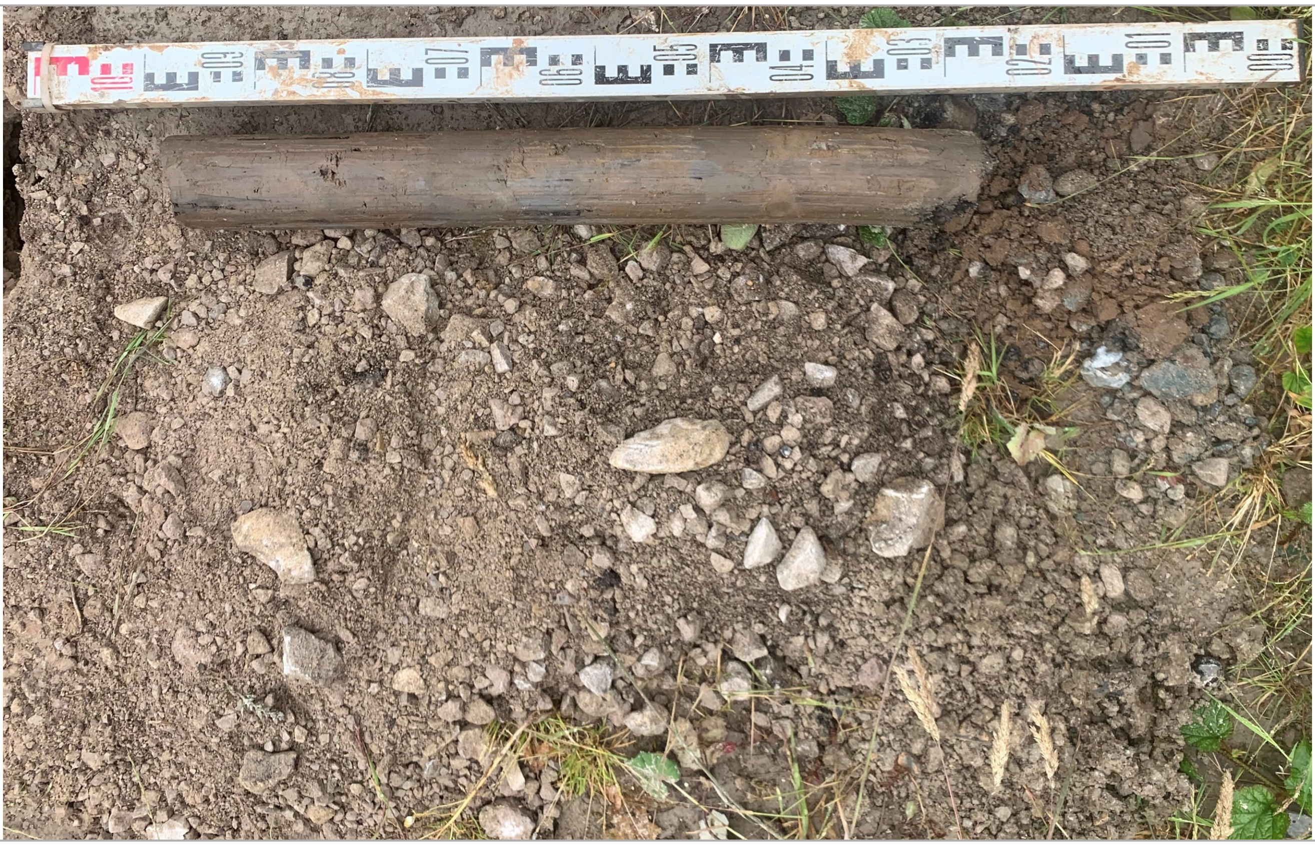

**Image 1.** WS08:
*View from right to left, bottom to top.*

*0.00m - 1.00m*
*1.00m - 2.00m*

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# Window Sample Log

ver. 1.5

| | | | |
|---|---|---|---|
| Window Sample No. | **WS09** | Sheet 1 of 1 | |
| Project Name: | Phase 3, Space Project | Co-ords: | 386908E - 396941N |
| | | Level (m AOD): | 52.56 |
| Project No. | 3534 | | |
| Location: | West Gorton | Date: | 25/06/2021 |
| Logged By | JH | | |
| Client: | Manchester City Council | Weather: | Showers |
| Checked By | AJ | | |

| Well / Backfill | Water Strikes | Sample and In Situ Testing Depth(m) | Type | Results | Depth (m) | Level (m AOD) | Stratum Description | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Dark brown, gravelly, slightly clayey fine to coarse SAND. Gravel is angular to subangular, fine to coarse of concrete and red brick.<br>MADE GROUND | |
| | | 0.20 | ES | | | | | |
| | | | | | 0.30 | 52.26 | Brownish grey, gravelly, slightly clayey fine to coarse SAND. Gravel is angular to subangular, fine to coarse of clinker, red brick and concrete.<br>MADE GROUND | |
| | | 0.50 | ES | | | | | |
| | | | | | 0.90 | 51.66 | Medium dense, dark grey, slightly gravelly, slightly clayey, silty fine to medium ashy SAND. Gravel is angular to subangular, fine to coarse of clinker.<br>MADE GROUND | |
| | | 1.00 | SPT | N=14<br>(6,5/4,3,3,4) | | | | 1 |
| | | 1.10 | ES | | | | | |
| | | | | | | | *Becoming clayey from 1.40m bgl.* | |
| | | | | | 1.80 | 50.76 | Firm, brown, mottled grey, slightly gravelly CLAY. Gravel is subrounded to well rounded, fine to coarse of mixed lithologies.<br>GLACIAL TILL | |
| | | 1.90 | | HVP=150 | | | | |
| | | 2.00 | SPT | N=18<br>(2,3/4,4,4,6) | | | | 2 |
| | | 2.50 | | HVP=104 | | | *Becoming stiff from 2.50m bgl.* | |
| | | 2.60 | | HVP=152 | | | | |
| | | 2.70 | | HVP=141 | | | | |
| | | 2.80 | B | | | | | |
| | | 2.80 | | HVP=151 | | | | |
| | | 2.90 | | HVP=152 | | | | |
| | | 3.00 | SPT | 50<br>(6,8/15,17,18,<br>) | | | | 3 |
| | | | | | 3.30 | 49.26 | Brown, clayey SAND.<br>GLACIAL TILL | |
| | | | | | 3.45 | 49.11 | Window Sample terminated at 3.45m. | |
| | | | | | | | | 4 |
| | | | | | | | | 5 |

Remarks:

Window sample terminated at 3.45m bgl due to refusal.

Hand dug pit undertaken to 1.00m bgl.

| Water Strike | | Casing Details | | Sample Sleeve Runs | | |
|---|---|---|---|---|---|---|
| Depth Strike | Remarks | Depth Base | Diameter | Depth Top (m) | Depth Base (m) | Diameter (mm) |
| | No strike | | | 1.00 | 2.00 | 87 |
| | | | | 2.00 | 3.00 | 77 |

# Window Sample Photos

**WS09**

Phase 3, Space Project

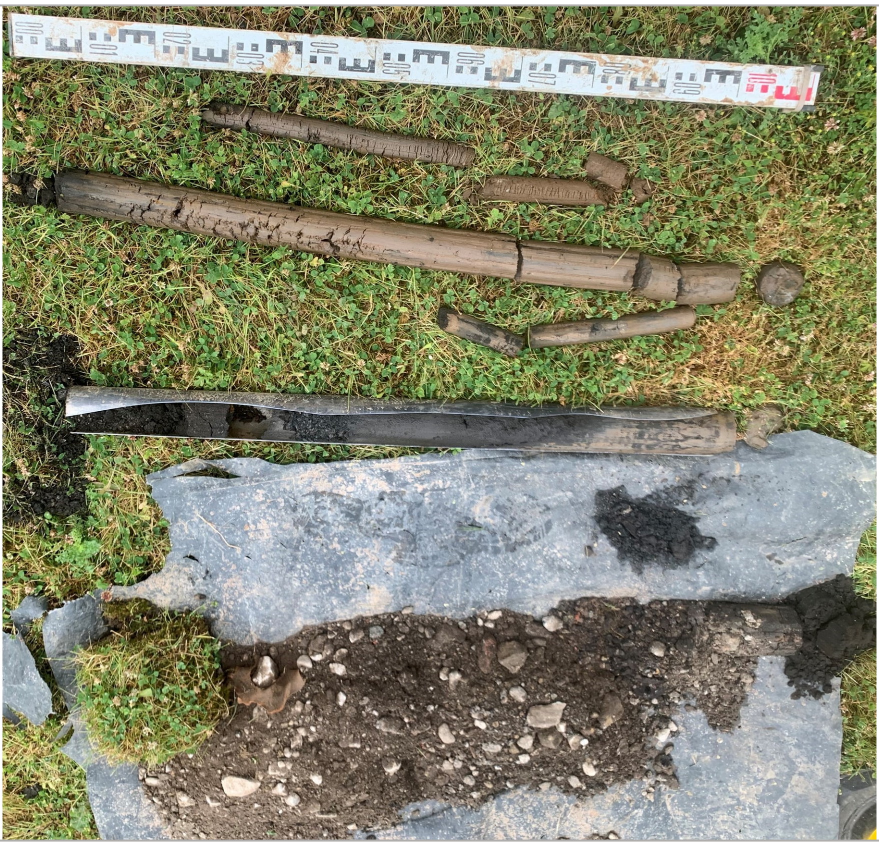

**Image 1.** WS09:
*View from left to right, bottom to top.*

*0.00m - 1.00m*
*1.00m - 2.00m*
*2.00m - 3.00m*

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# Window Sample Log

ver. 1.5

Window Sample No.
**WS10**
Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Phase 3, Space Project | Co-ords: | 386853E - 396949N | Project No. | 3534 |
| Location: | West Gorton | Level (m AOD): | 52.12 | Logged By | JH |
| Client: | Manchester City Council | Date: | 25/06/2021 | Checked By | AJ |
| | | Weather: | Showers | | |

| Well / Backfill | Water Strikes | Sample and In Situ Testing: Depth(m) | Type | Results | Depth (m) | Level (m AOD) | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | | | Brown, slightly gravelly fine to coarse SAND with frequent rootlets. Gravel is angular to subangular, fine to medium of concrete, red brick, ceramic, slate, plastic and glass.<br>MADE GROUND |
| | | 0.20 | ES | | | | |
| | | | | | 0.30 | 51.82 | Dark greyish brown fine to coarse SAND and angular to subangular, fine to coarse GRAVEL of concrete and red brick with frequent cobbles. Cobbles are angular of concrete.<br>MADE GROUND |
| | | 0.50 | ES | | | | |
| | | | | | 0.60 | 51.52 | Dark brownish grey, gravely fine to coarse SAND. Gravel is angular to subangular, fine to coarse of clinker, concrete and red brick.<br>MADE GROUND |
| | | 0.80 | ES | | | | |
| | | | | | 0.90 | 51.22 | Stiff, brown, mottled grey, slightly gravelly CLAY. Gravel is subrounded to well rounded, fine to coarse of mixed lithologies.<br>GLACIAL TILL |
| | | 1.00 | SPT | N=9<br>(1,1/1,2,3,3) | | | |
| | | 1.50 | | HVP=94 | | | |
| | | 1.60 | | HVP=165 | | | |
| | | 1.70 | | HVP=131 | | | |
| | | 1.80 | | HVP=145 | | | |
| | | 2.00 | SPT | N=20<br>(3,3/4,4,5,7) | | | |
| | | 2.50 | | HVP=142 | | | |
| | | 2.60 | | HVP=167 | | | |
| | | 2.70 | | HVP=137 | | | |
| | | 2.80 | B | | | | |
| | | 2.90 | | HVP=166 | | | |
| | | 3.00 | SPT | 50 (5,8/50 for 775mm) | | | |
| | | | | | 3.45 | 48.67 | Window Sample terminated at 3.45m. |

Remarks:

Window sample terminated at 3.45m bgl due to refusal.

Hand dug pit undertaken to 1.00m bgl.

| Water Strike: Depth Strike | Remarks | Casing Details: Depth Base | Diameter | Sample Sleeve Runs: Depth Top (m) | Depth Base (m) | Diameter (mm) |
|---|---|---|---|---|---|---|
| | No strike | | | 1.00 | 2.00 | 87 |
| | | | | 2.00 | 3.00 | 77 |

# Window Sample Photos

**WS10**

Phase 3, Space Project

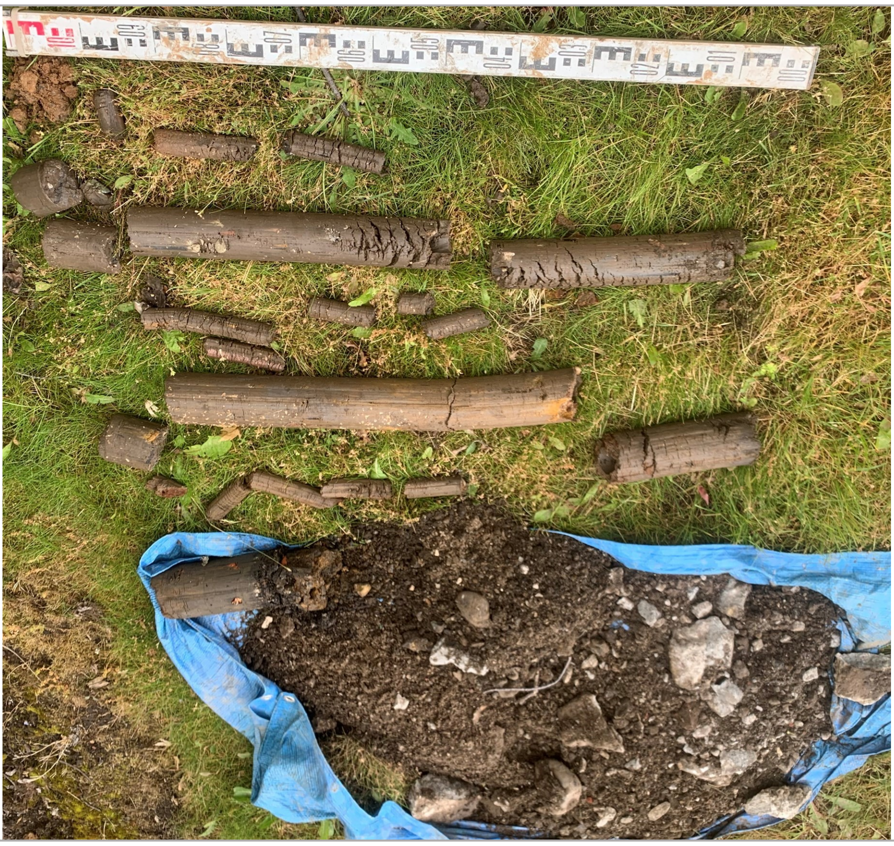

**Image 1.** WS10:
*View from right to left, bottom to top.*

*0.00m - 1.00m*
*1.00m - 2.00m*
*2.00m - 3.00m*

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# Window Sample Log

ver. 1.5

Window Sample No.
**WS11**
Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Phase 3, Space Project | Co-ords: | 386840E - 396942N | Project No. | 3534 |
| Location: | West Gorton | Level (m AOD): | 51.97 | Logged By | JH |
| | | Date: | 25/06/2021 | | |
| Client: | Manchester City Council | Weather: | Showers | Checked By | AJ |

| Well / Backfill | Water Strikes | Sample and In Situ Testing Depth(m) | Type | Results | Depth (m) | Level (m AOD) | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | | | Dark brown, slightly gravelly, slightly clayey fine to coarse SAND with occasional rootlets. Gravel is angular to subangular, fine to coarse of concrete, red brick, slate and ceramic.<br>MADE GROUND |
| | | 0.20 | ES | | | | |
| | | | | | 0.40 | 51.57 | Dark grey, gravelly fine to coarse SAND. Gravel is angular to subangular, fine to coarse of clinker, red brick and concrete.<br>MADE GROUND |
| | | 0.60 | ES | | | | |
| | | 1.00 | SPT | N=11 (2,1/2,2,3,4) | 1.00 | 50.97 | Stiff, brown, mottled grey, slightly gravelly CLAY. Gravel is subrounded to well rounded, fine to coarse of mixed lithologies.<br>GLACIAL TILL |
| | | 1.10 | | HVP=94 | | | |
| | | 1.20 | | HVP=114 | | | |
| | | 1.30 | | HVP=150 | | | |
| | | 1.40 | | HVP=141 | | | |
| | | 1.50 | | HVP=180 | | | |
| | | 1.60 | | HVP=128 | | | |
| | | 1.70 | | HVP=115 | | | |
| | | 1.80 | | HVP=87 | | | |
| | | 1.90 | | HVP=95 | | | |
| | | 2.00 | SPT | N=27 (4,5/5,6,7,9) | | | |
| | | 2.50 | | HVP=183 | | | |
| | | 2.60 | | HVP=164 | | | |
| | | 2.80 | B | | | | |
| | | 2.80 | | HVP=194 | | | |
| | | 2.90 | | HVP=194 | | | |
| | | 3.00 | SPT | 50 (11,13/50 for 250mm) | 3.00 | 48.97 | Very dense, brown, clayey SAND.<br>GLACIAL TILL |
| | | | | | 3.45 | 48.52 | Window Sample terminated at 3.45m. |

Remarks:

Window sample terminated at 3.45m bgl due to refusal.

Hand dug pit undertaken to 1.00m bgl.

| Water Strike | | Casing Details | | Sample Sleeve Runs | | |
|---|---|---|---|---|---|---|
| Depth Strike | Remarks | Depth Base | Diameter | Depth Top (m) | Depth Base (m) | Diameter (mm) |
| | No strike | | | 1.00 | 2.00 | 87 |
| | | | | 2.00 | 3.00 | 77 |

# Window Sample Photos

## WS11

Phase 3, Space Project

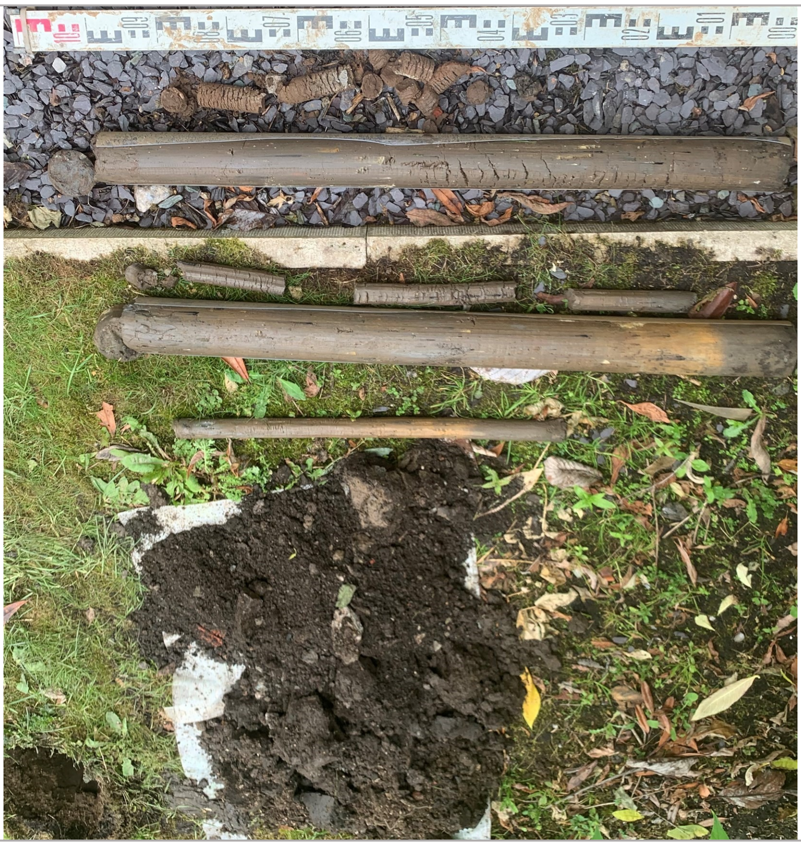

**Image 1.** WS11:
*View from right to left, bottom to top.*

*0.00m - 1.00m*
*1.00m - 2.00m*
*2.00m - 3.00m*

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# Window Sample Log

ver. 1.5

Window Sample No.
**WS12**
Sheet 1 of 1

| | | | |
|---|---|---|---|
| Project Name: | Phase 3, Space Project | Co-ords: | 386804E - 396931N |
| | | Level (m AOD): | 51.50 |
| Location: | West Gorton | Date: | 25/06/2021 |
| Client: | Manchester City Council | Weather: | Showers |

Project No. 3534
Logged By JH
Checked By AJ

| Sample Depth(m) | Type | Results | Depth (m) | Level (m AOD) | Stratum Description |
|---|---|---|---|---|---|
| | | | | | Light brownish grey, sandy, angular to subangular, fine to coarse GRAVEL limestone, concrete and mixed natural lithologies.<br>MADE GROUND |
| 0.30 | ES | | | | |
| | | | 0.50 | 51.00 | Dark brownish grey, sandy, angular to subangular, fine to coarse GRAVEL of red brick, clinker and concrete with occasional whole and half bricks.<br>MADE GROUND |
| 0.80 | ES | | | | |
| 1.00 | SPT | N=12 (3,3/3,3,3,3) | 1.00 | 50.50 | Stiff, brown, mottled grey, slightly gravelly CLAY. Gravel is subrounded to well rounded, fine to coarse of mixed lithologies.<br>GLACIAL TILL |
| 1.20 | ES | | | | |
| 1.20 | | HVP=145 | | | |
| 1.30 | | HVP=184 | | | |
| 1.40 | | HVP=184 | | | |
| 1.50 | | HVP=194 | | | |
| 1.70 | | HVP=194 | | | |
| 1.90 | | HVP=181 | | | |
| 2.00 | SPT | N=24 (3,4/6,5,6,7) | | | |
| 2.20 | | HVP=177 | | | |
| 2.30 | | HVP=164 | | | |
| 2.40 | | HVP=178 | | | |
| 2.50 | B | | | | |
| 2.50 | | HVP=194 | | | |
| 2.60 | | HVP=194 | | | *Becoming sandy from 2.70m bgl.* |
| 2.80 | SPT | 50 (10,13/50 for 255mm) | | | |
| | | | 3.00 | 48.50 | Very dense, brown, clayey SAND.<br>GLACIAL TILL |
| | | | 3.25 | 48.25 | Window Sample terminated at 3.25m. |

1
2
3
4
5

Remarks:

Window sample terminated at 3.25m bgl due to refusal.

Hand dug pit undertaken to 1.00m bgl.

| Water Strike: Depth Strike | Water Strike: Remarks | Casing Details: Depth Base | Casing Details: Diameter |
|---|---|---|---|
| | No strike | | |

| Sample Sleeve Runs: Depth Top (m) | Depth Base (m) | Diameter (mm) |
|---|---|---|
| 1.00 | 2.00 | 87 |
| 2.00 | 3.00 | 77 |

# Window Sample Photos

**WS12**

Phase 3, Space Project

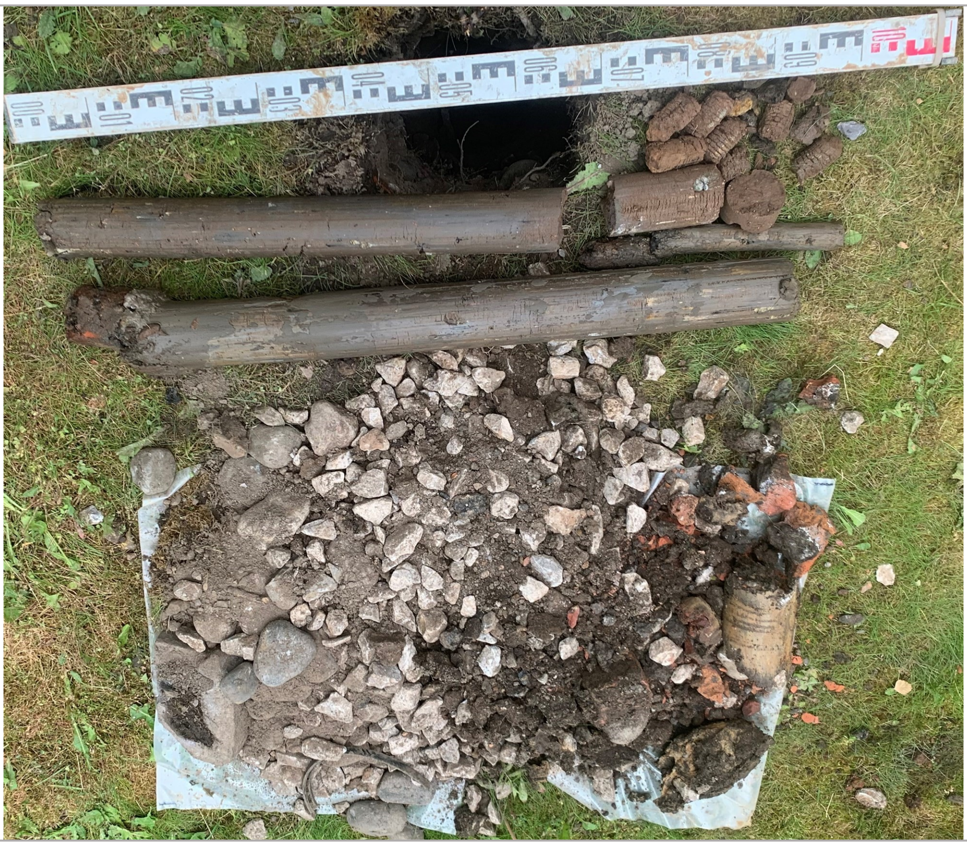

**Image 1.** WS12:
*View from left to right, bottom to top.*

*0.00m - 1.00m*
*1.00m - 2.00m*
*2.00m - 3.00m*

# APPENDIX 6

# CABLE PERCUSSIVE BOREHOLE LOGS

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# Borehole Log

ver. 0.5

**Borehole No.**

**BH01**

Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| **Project Name:** | Phase 3, Space Project | **Co-ords:** | 386884E - 396928N | **Project No.:** | 3534 |
| **Location:** | West Gorton | **Level (mAOD):** | 51.94 | **Rev.:** | 1.0 |
| | | **Dates:** | 25/06/2021 | **Logged By:** | JH |
| **Client:** | Manchester City Council | **Weather:** | Showers | **Checked By:** | AJ |

| Well / Backfill | Water Strikes | Sample and In Situ Testing | | | Depth (mbgl) | Level (mAOD) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | Type | Results | | | | |
| ▨ | | 0.20 - 0.60 | B | | | | ▨ | Greyish brown, sandy, slightly clayey GRAVEL. Gravel is angular to subangular, fine to coarse of limestone and concrete.<br>MADE GROUND |
| ▨ | | 0.70 - 1.00 | B | | 0.70 | 51.24 | | Stiff, orangish brown, mottled grey, slightly gravelly, slightly sandy CLAY. Gravel is subrounded to well rounded, fine to coarse of mixed lithologies.<br>GLACIAL TILL |
| ▨ | | 1.00<br>1.00 | B<br>SPT | N=12 (1,1/2,3,3,4) | | | | |
| ▨ | | 2.00 | U | 30 Blows 90% Recovery | | | | |
| ▨ | | 3.00<br>3.00 | B<br>SPT | 50 (10,10/50 for 155mm) | | | | |
| ▨ | | 4.00<br>4.00 | B<br>SPT | N=50 (6,8/50 for 285mm) | | | | |
| ▨ | | 5.00<br>5.00 | B<br>SPT | N=20 (3,4/4,4,5,7) | | | | |
| ▨ | | 6.50<br>6.50 | B<br>SPT | N=35 (5,7/8,8,9,10) | | | | |
| ▨ | ▼ | | | | | | | |
| ▨ | | 7.50<br>7.50 | D<br>SPT | 50 (9,16/50 for 125mm) | 7.50 | 44.44 | | Suspected weathered SANDSTONE recovered as light blueish grey, sandy, angular to subangular, fine to coarse GRAVEL of sandstone.<br>POSSIBLE WEATHERED SANDSTONE |
| | | | | | 7.95 | 43.99 | | Borehole terminated at 7.95m. |

**Remarks:**

Borehole terminated at 7.95m bgl on suspected bedrock.

**SPT Energy Ratio:** 70%

| Casing Details | | | Chiselling Details | | |
|---|---|---|---|---|---|
| Depth Top (m) | Depth Base (m) | Diameter (mm) | Depth Top (m) | Depth Base (m) | Duration (hrs) |
| GL | 7.50 | 200 | 0.20 | 0.50 | 00:30 |

| Water Strike | | |
|---|---|---|
| Depth Strike (m) | Time Elapsed (min) | Water Level (m) |
| 7.00 | | |

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# Borehole Log

ver. 0.5

**Borehole No.**
**BH02**
Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| **Project Name:** | Phase 3, Space Project | **Co-ords:** | 386814E - 396917N | **Project No.:** | 3534 |
| **Location:** | West Gorton | **Level (mAOD):** | 51.79 | **Rev.:** | 1.0 |
| | | **Dates:** | 23/07/2021 | **Logged By:** | LM |
| **Client:** | Manchester City Council | **Weather:** | Overcast | **Checked By:** | AJ |

| Well / Backfill | Water Strikes | Sample and In Situ Testing: Depth (m) | Type | Results | Depth (mbgl) | Level (mAOD) | | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | 0.10 | 51.69 | | Light grey, sandy, silty, angular to subangular, fine to coarse GRAVEL of limestone and concrete.<br>MADE GROUND |
| | | 0.20 - 0.60 | B | | | | | Dark brown, gravelly, silty, fine to coarse SAND. Gravel is angular to subangular, fine to coarse of concrete, limestone, clinker, coal and brick fragments.<br>MADE GROUND |
| | | 0.70 - 1.00 | B | | 0.70 | 51.09 | | Firm, dark greyish brown, mottled black, slightly gravelly, sandy CLAY. Gravel is angular to subrounded of fine to coarse concrete, brick fragments, clinker, mudstone, sandstone and coal.<br>MADE GROUND |
| | | 1.00 | B | | | | | |
| | | 1.00 | SPT | N=33 (5,8/8,9,9,7) | | | | |
| | | | | | 1.60 | 50.19 | | Stiff, brown, slightly gravelly, slightly sandy CLAY. Gravel is subrounded to well rounded, fine to coarse of mixed lithologies.<br>GLACIAL TILL |
| | | 2.00 | B | | 2.00 | 49.79 | | Medium dense, brown, silty, fine to coarse SAND.<br>GLACIAL TILL |
| | | 2.00 | SPT | N=13 (3,5/3,4,2,4) | | | | |
| | | | | | 2.90 | 48.89 | | Stiff, brown, slightly gravelly, slightly sandy CLAY. Gravel is subrounded to well rounded, fine to coarse of mixed lithologies.<br>GLACIAL TILL |
| | | 3.00 | U | 36 blows 40% Recovery | | | | |
| | | 4.00 | B | | | | | |
| | | 4.00 | SPT | N=50 (8,11/50 for 275mm) | | | | |
| | | 5.00 | B | | | | | |
| | | 5.00 | SPT | N=50 (6,12/50 for 240mm) | | | | |
| | | 6.50 | B | | | | | |
| | | 6.50 | SPT | N=50 (8,10/50 for 230mm) | | | | |
| | | | | | 7.90 | 43.89 | | Suspected weathered MUDSTONE recovered as grey, angular to suabngular, fine to coarse GRAVEL of mudstone.<br>POSSIBLE WEATHERED MUDSTONE |
| | | 8.00 | D | | | | | |
| | | 8.00 | SPT | 50 (7,12/50 for 155mm) | | | | |
| | | | | | 8.45 | 43.34 | | Borehole terminated at 8.45m. |

**Remarks:**

Borehole terminated at 8.45m bgl on suspected bedrock.

Casing Details

| Depth Top (m) | Depth Base (m) | Diameter (mm) |
|---|---|---|
| GL | 8.00 | 200 |

Chiselling Details

| Depth Top (m) | Depth Base (m) | Duration (hrs) |
|---|---|---|
| 0.10 | 0.50 | 00:30 |

Water Strike

| Depth Strike (m) | Time Elapsed (min) | Water Level (m) |
|---|---|---|
| | | |

**SPT Energy Ratio:** 70%

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# Borehole Log

ver. 0.5

**Borehole No.**
**BH03**
Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| **Project Name:** | Phase 3, Space Project | **Co-ords:** | 386741E - 396877N | **Project No.:** | 3534 |
| **Location:** | West Gorton | **Level (mAOD):** | 51.56 | **Rev.:** | 1.0 |
| **Client:** | Manchester City Council | **Dates:** | 24/06/2021 | **Logged By:** | JH |
| | | **Weather:** | Showers | **Checked By:** | AJ |

| **Well / Backfill** | **Water Strikes** | **Sample and In Situ Testing** | | | **Depth (mbgl)** | **Level (mAOD)** | **Stratum Description** |
|---|---|---|---|---|---|---|---|
| | | **Depth (m)** | **Type** | **Results** | | | |
| | | 0.20 - 0.50 | B | | | | Dark brownish grey, sandy, slighlty clayey, angular to subangular, fine to coarse GRAVEL of concrete, red brick, slate and ceramic.<br>MADE GROUND |
| | | 0.60 - 1.00 | B | | 0.60 | 50.96 | Firm, dark brownish grey, slightly gravelly, slightly sandy CLAY. Gravel is angular to subangular, fine to coarse of concrete, red brick, clinker and slate.<br>MADE GROUND |
| | | 1.00<br>1.00 | B<br>SPT | N=5 (1,1/1,1,2,1) | | | |
| | | | | | 1.50 | 50.06 | Stiff, brown, slightly gravelly, slightly sandy CLAY. Gravel is subrounded to well rounded, fine to coarse of mixed lithologies.<br>GLACIAL TILL |
| | | 2.00 | U | 28 blows 50% Recovery | | | |
| | | 3.00<br>3.00 | B<br>SPT | N=43 (7,9/10,10,11,12) | | | |
| | | 4.00<br>4.00 | B<br>SPT | N=50 (7,8/50 for 295mm) | | | |
| | | 5.00<br>5.00 | B<br>SPT | N=50 (6,10/50 for 230mm) | | | |
| | | 6.50<br>6.50 | B<br>SPT | N=50 (8,8/50 for 235mm) | | | |
| | | 8.00<br>8.00 | D<br>SPT | 50 (6,10/50 for 180mm) | 8.00 | 43.56 | Suspected weathered MUDSTONE recovered as grey, angular to suabngular, fine to coarse GRAVEL of mudstone.<br>POSSIBLE WEATHERED MUDSTONE |
| | | | | | 8.45 | 43.11 | Borehole terminated at 8.45m. |

**Remarks:**

Borehole terminated at 8.45m bgl on suspected bedrock.

**SPT Energy Ratio:** 70%

| Casing Details | | | Chiselling Details | | |
|---|---|---|---|---|---|
| Depth Top (m) | Depth Base (m) | Diameter (mm) | Depth Top (m) | Depth Base (m) | Duration (hrs) |
| GL | 8.00 | 200 | 0.10 | 0.40 | 00:30 |

| Water Strike | | |
|---|---|---|
| Depth Strike (m) | Time Elapsed (min) | Water Level (m) |
| | | |

# APPENDIX 7

# TRIAL PIT LOGS AND PHOTOGRAPHS

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# Trial Pit Log

ver. 1.1

**Trial Pit No.**
TP01
Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| **Project Name:** | Phase 3, Space Project | **Level (mAOD):** 51.61 | **Date:** 23/06/2021 | **Project No.** 3534 |
| **Location:** | West Gorton | **Weather:** | Sunny | **Logged By** LM |
| **Client:** | Manchester City Council | **Co-ords:** | 386718E - 396876N | **Checked By** AJ |

| Water Strike | Samples & In Situ Testing Depth (m) | Type | Results | Depth (mbgl) | Level (mAOD) | Stratum Description |
|---|---|---|---|---|---|---|
| | | | | 0.20 | 51.41 | Light grey gravelly silty fine to coarse SAND. Gravel is angular to subrounded fine to coarse of limestone and concrete with rare plastic, wire and metal.<br>MADE GROUND |
| | 0.35<br>0.35 | B<br>ES | | 0.70 | 50.91 | Dark brown, gravelly, silty, fine to coarse SAND with a low cobble content. Gravel is angular to subangular fine to coarse of limestone and concrete with glass, plastic, wire, metal and brick fragments. Cobbles are angular of whole bricks and concrete.<br>MADE GROUND<br>*Disused 0.06m diameter cast iron pipe at 0.45m bgl.* |
| | | | | 0.75 | 50.86 | Light grey angular medium to coarse GRAVEL of limestone.<br>MADE GROUND |
| | | | | 1.20 | 50.41 | Dark brown mottled black gravelly silty fine to coarse SAND with a low cobble content. Gravel is angular to subrounded fine to coarse of limestone, clinker, brick fragments, glass, metal, ceramic and rare timber. Cobbles are angular of concrete, whole bricks and cobble sets.<br>MADE GROUND |
| | 1.35<br>1.35 | B<br>ES | | 1.45 | 50.16 | Dark brown gravelly silty fine to coarse ashy SAND. Gravel is subrounded fine to medium of clinker.<br>MADE GROUND |
| | 1.55<br>1.55 | B<br>ES | | 1.80 | 49.81 | Firm light greyish brown mottled light orange slightly gravelly, slightly sandy CLAY. Gravel is subangular to subrounded fine to medium of mudstone, sandstone, coal and brick fragments.<br>MADE GROUND |
| | | | | 2.50 | 49.11 | Firm to stiff dark brown slightly gravelly, slightly sandy CLAY. Gravel is subangular to rounded fine to medium of mudstone and sandstone.<br>GLACIAL TILL |
| | | | | | | Trial Pit terminated at 2.50m. |

**Water Strike**

| Depth Strike (mbgl) | Remarks |
|---|---|
| | No strike |

**Stability:**
Stable during excavtion

**Remarks:**
Trial pit terminated at 2.50m bgl at target depth.

# Trial Pit Photos

**TP01**

Phase 3, Space Project

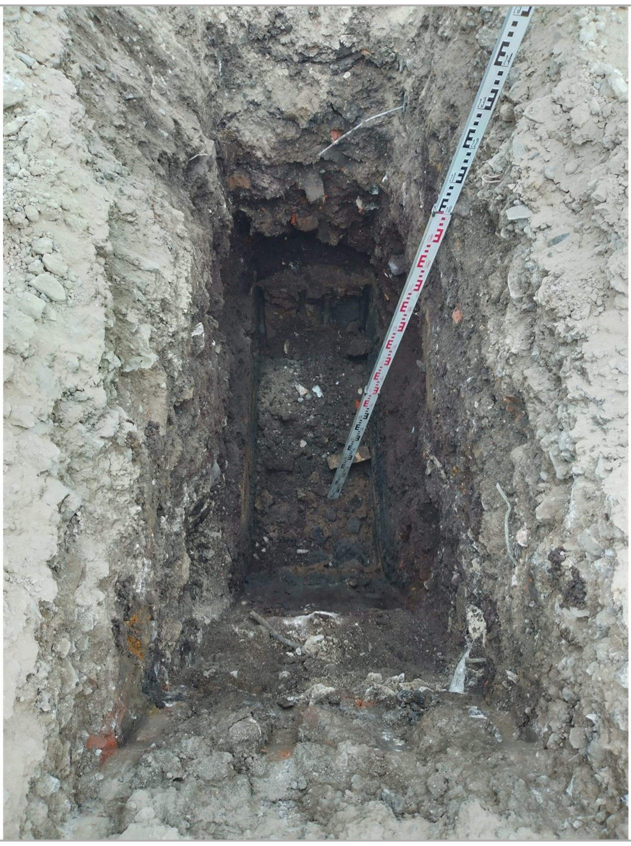

**Image 1.** TP01
*TP01*

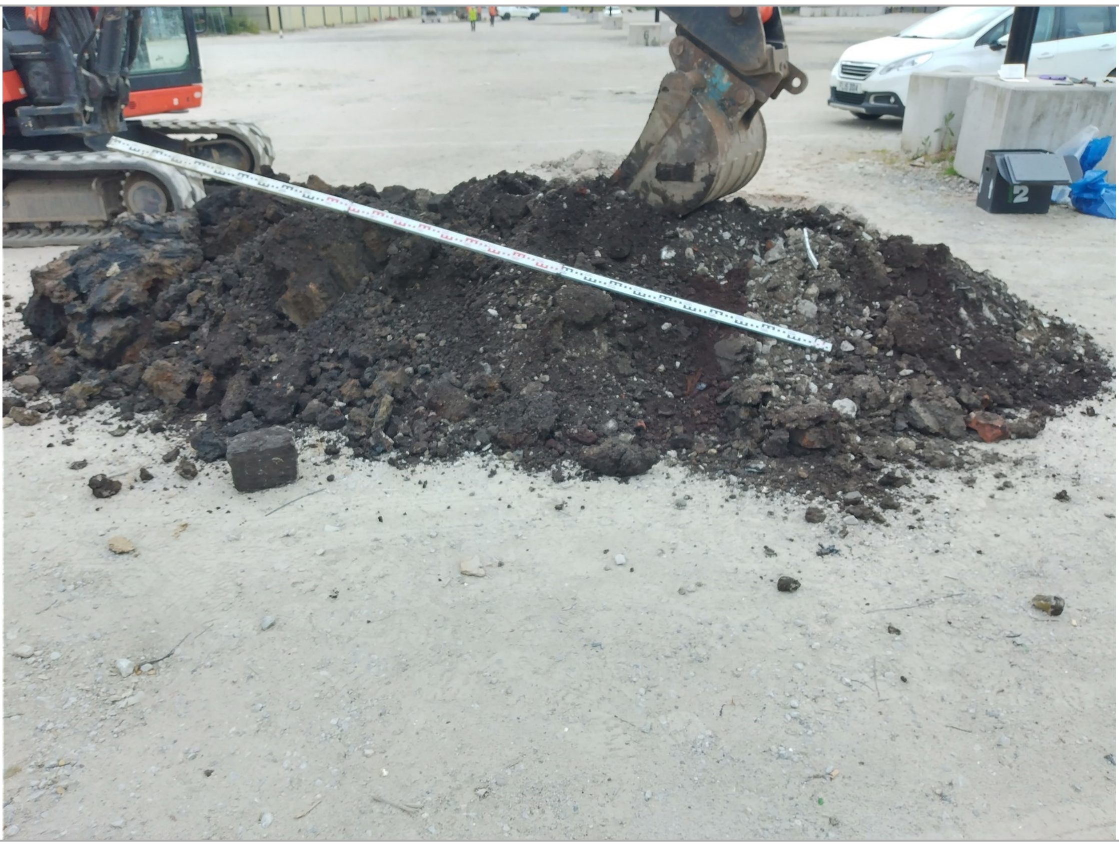

**Image 2.** TP01 SPOIL
*TP01 SPOIL*

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# Trial Pit Log

ver. 1.1

**Trial Pit No.** TP02
Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| **Project Name:** | Phase 3, Space Project | **Level (mAOD):** 51.66 | **Date:** 23/06/2021 | | **Project No.** 3534 |
| **Location:** | West Gorton | **Weather:** | Sunny | | **Logged By** LM |
| **Client:** | Manchester City Council | **Co-ords:** | 386761E - 396871N | | **Checked By** AJ |

| Water Strike | Samples & In Situ Testing | | | Depth (mbgl) | Level (mAOD) | Stratum Description |
|---|---|---|---|---|---|---|
| | Depth (m) | Type | Results | | | |
| | | | | 0.15 | 51.51 | Light grey gravelly silty fine to coarse SAND. Gravel is angular to subrounded fine to coarse of limestone and concrete.<br>MADE GROUND |
| | | | | 0.45 | 51.21 | Dark brown gravelly silty fine to coarse SAND with a low cobble content. Gravel is angular to subangular fine to coarse of limestone and concrete with glass, plastic, fabric and brick fragments. Cobbles are angular of whole bricks and concrete.<br>MADE GROUND |
| | 0.75<br>0.75 | B<br>ES | | 1.10 | 50.56 | Firm dark greyish brown mottled light brown slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to coarse of concrete, brick fragments, clinker, metal, glass, wire and ceramic.<br>MADE GROUND<br>*Disused clay pipe at 1.00m bgl.* |
| | | | | 1.90 | 49.76 | Firm to stiff dark greyish brown slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone with rare coal.<br>GLACIAL TILL<br>*Becoming orangish brown from 1.30m bgl.* |
| | | | | 2.00 | 49.66 | Light orangish brown very silty fine to medium SAND.<br>GLACIAL TILL |
| | | | | | | Trial Pit terminated at 2.00m. |

**Water Strike**

| Depth Strike (mbgl) | Remarks |
|---|---|
| | No strike |

**Stability:**
Stable during excavation

**Remarks:**
Trial pit terminated at 2.00m bgl at target depth.

# Trial Pit Photos

**TP02**

Phase 3, Space Project

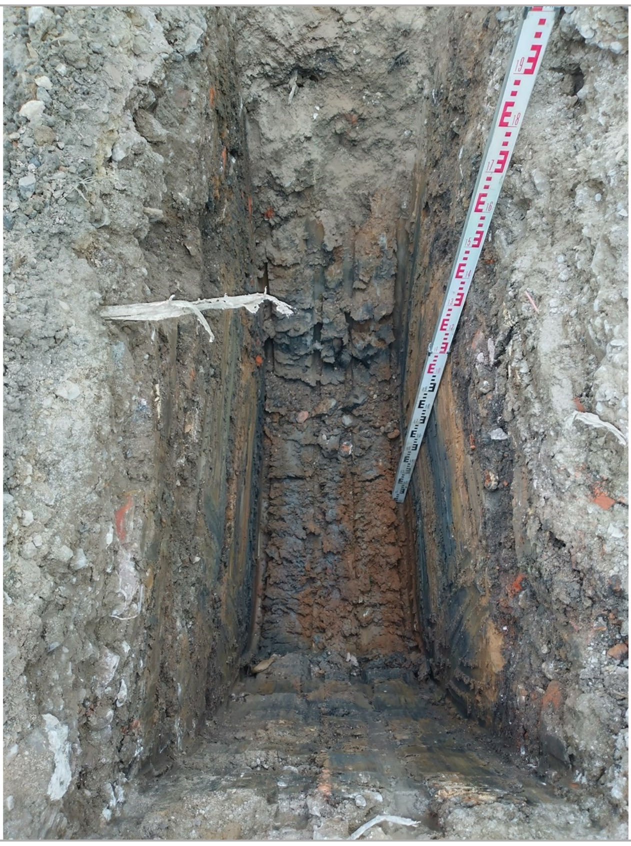

**Image 1.** TP02
*TP02*

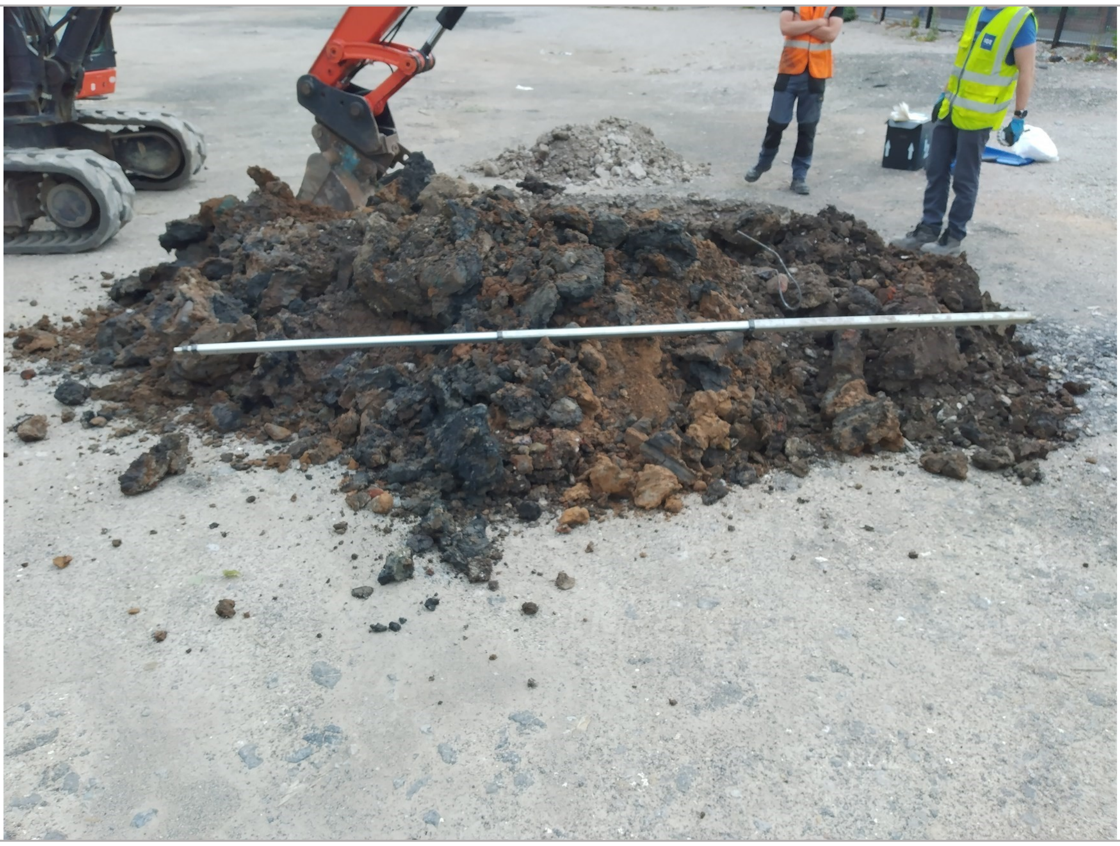

**Image 2.** TP02 SPOIL
*TP02 SPOIL*

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# Trial Pit Log

ver. 1.1

**Trial Pit No.**
TP03
Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| **Project Name:** Phase 3, Space Project | **Level (mAOD):** | 51.67 | **Date:** 23/06/2021 | **Project No.**<br>3534 |
| **Location:** West Gorton | **Weather:** | Sunny | | **Logged By**<br>LM |
| **Client:** Manchester City Council | **Co-ords:** | 386783E - 396881N | | **Checked By**<br>AJ |

| Water Strike | Samples & In Situ Testing | | | Depth (mbgl) | Level (mAOD) | Stratum Description |
|---|---|---|---|---|---|---|
| | Depth (m) | Type | Results | | | |
| | | | | 0.10 | 51.57 | Light grey gravelly silty fine to coarse SAND. Gravel is angular to subrounded fine to coarse of limestone and concrete.<br>MADE GROUND |
| | | | | 0.30 | 51.37 | Dark brown gravelly stilty fine to coarse SAND with a low cobble content. Gravel is angular to subangular fine to coarse of limestone, concrete, glass, brick fragments and rare plastic. Cobbles are angular to subrounded of concrete and whole bricks.<br>MADE GROUND |
| | | | | 0.80 | 50.87 | Firm dark greyish brown mottled light brown slightly gravelly, slightly sandy CLAY. Gravel is subangular to subrounded fine to coarse of concrete, brick fragments, mudstone, sandstone, coal and rare clinker.<br>MADE GROUND |
| | 1.00<br>1.00<br>1.00<br>1.20<br>1.20<br>1.30<br>1.30<br>1.30 | <br><br><br>B<br>ES<br><br><br> | HVP=100<br>HVP=106<br>HVP=114<br><br><br>HVP=130<br>HVP=133<br>HVP=139 | 1.85 | 49.82 | Stiff dark brown mottled light grey slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to coarse of mudstone and sandstone with rare coal.<br>GLACIAL TILL |
| | | | | 2.00 | 49.67 | Light orangish brown gravelly silty fine to coarse SAND. Gravel is subrounded fine of mudstone.<br>GLACIAL TILL |
| | | | | | | Trial Pit terminated at 2.00m. |

**Water Strike**

| Depth Strike (mbgl) | Remarks |
|---|---|
| | No strike |

**Stability:**
Stable during excavation

**Remarks:**
Trial pit terminated at 2.00m bgl at target depth.

| Trial Pit Photos | **TP03**<br>Phase 3, Space Project |
|---|---|

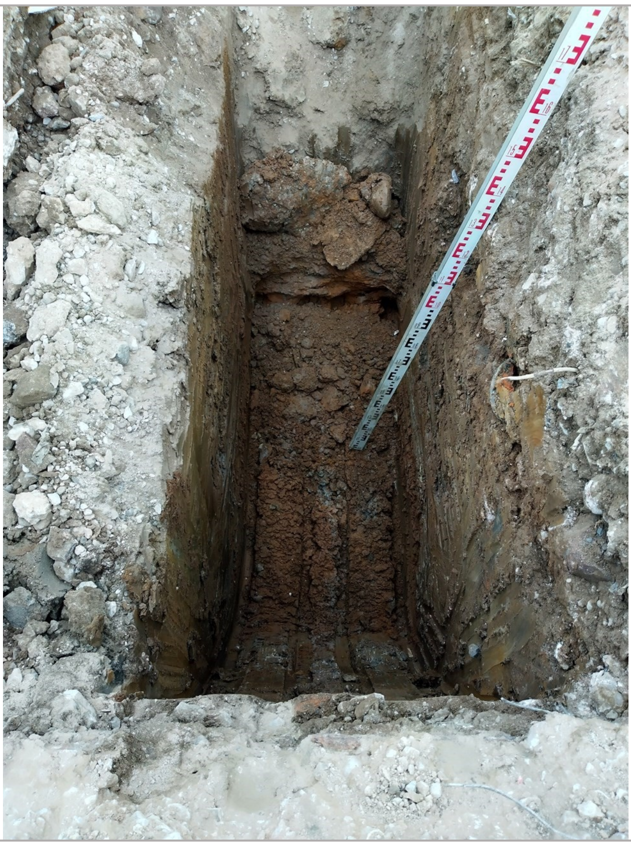

**Image 1.** TP03
*TP03*

**Image 2.** TP03 SPOIL
*TP03 SPOIL*

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# Trial Pit Log

ver. 1.1

| | | | | |
|---|---|---|---|---|
| **Trial Pit No.** TP04 | | | | Sheet 1 of 1 |
| **Project Name:** | Phase 3, Space Project | **Level (mAOD):** 51.51 | **Date:** 23/06/2021 | **Project No.** 3534 |
| **Location:** | West Gorton | **Weather:** | | **Logged By** |
| **Client:** | Manchester City Council | **Co-ords:** | 386752E - 396899N | **Checked By** AJ |

| **Water Strike** | **Samples & In Situ Testing** | | | **Depth (mbgl)** | **Level (mAOD)** | **Stratum Description** |
|---|---|---|---|---|---|---|
| | **Depth (m)** | **Type** | **Results** | | | |
| | | | | 0.10 | 51.41 | Light grey gravelly silty fine to coarse SAND. Gravel is angular to subrounded fine to coarse of limestone and concrete.<br>MADE GROUND |
| | | | | 0.30 | 51.21 | Dark brown gravelly silty fine to coarse SAND with a low cobble content. Gravel is angular to subangular fine to coarse of limestone, concrete, glass, brick fragments and rare plastic. Cobbles are angular to subrounded of concrete and whole bricks.<br>MADE GROUND |
| | 0.40<br>0.40 | B<br>ES | | 0.95 | 50.56 | Dark brown mottled black gravelly silty fine to coarse ashy SAND. Gravel is angular to subrounded fine to coarse of brick fragments, clinker and plastic<br>MADE GROUND<br>*Geotextile membrane at southern edge of pit at 0.50m bgl.* |
| | 1.00<br>1.00 | B<br>ES | | 1.20 | 50.31 | Firm dark grey mottled black slightly sandy CLAY with cobble sized pockets of dark grey silty fine to medium SAND. Mild bituminous odour.<br>MADE GROUND |
| | 1.50<br>1.50<br>2.00<br>2.00<br>2.00 | B<br>ES | HVP=44<br>HVP=44<br>HVP=47 | 2.10 | 49.41 | Firm dark grey mottled light grey sandy gravelly CLAY with occasional rootlets. Gravel is angular to subrounded fine to coarse of coal and mudstone with rare brick fragments.<br>MADE GROUND |
| | | | | 2.30 | 49.21 | Stiff light brown mottled light grey slightly gravelly sandy CLAY. Gravel is angular fine of mudstone.<br>GLACIAL TILL |
| | | | | | | Trial Pit terminated at 2.30m. |

**Water Strike**

| **Depth Strike (mbgl)** | **Remarks** |
|---|---|
| | No strike |

**Stability:**

**Remarks:**

Trial pit terminated at 2.30m bgl at target depth.

# Trial Pit Photos

**TP04**

Phase 3, Space Project

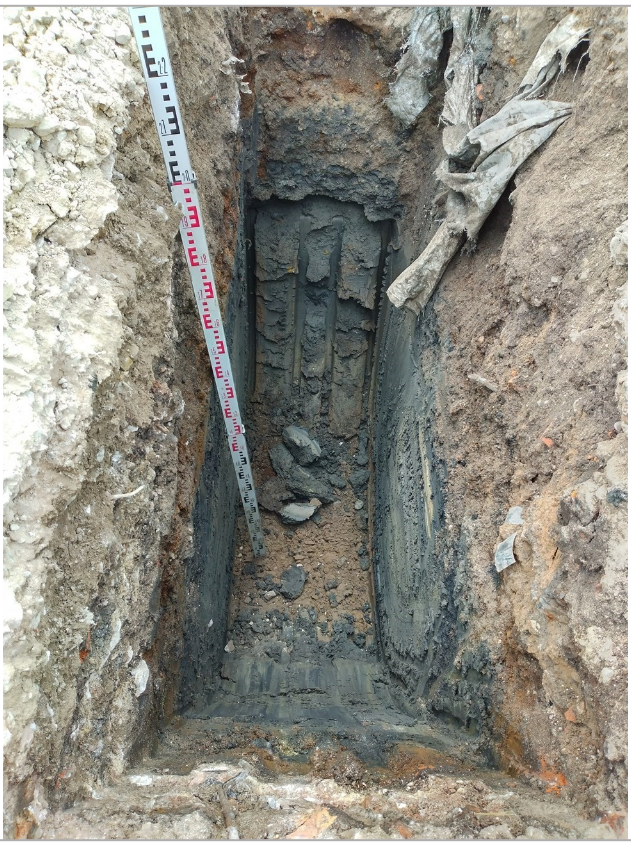

**Image 1.** TP04
*TP04*

**Image 2.** TP04 SPOIL
*TP04 SPOIL*

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# Trial Pit Log

ver. 1.1

| | | | | | |
|---|---|---|---|---|---|
| **Trial Pit No.** | TP05 | Sheet 1 of 1 | | | |
| **Project Name:** | Phase 3, Space Project | **Level (mAOD):** | 51.60 | **Date:** | 23/06/2021 |
| **Project No.** | 3534 | | | | |
| **Location:** | West Gorton | **Weather:** | Sunny | **Logged By** | LM |
| **Client:** | Manchester City Council | **Co-ords:** | 386797E - 396912N | **Checked By** | AJ |

| Water Strike | Samples & In Situ Testing | | | Depth (mbgl) | Level (mAOD) | Stratum Description |
|---|---|---|---|---|---|---|
| | Depth (m) | Type | Results | | | |
| | 0.10<br>0.10<br>0.25 | B<br>ES<br>ES | | 0.15 | 51.45 | Light grey gravelly silty fine to coarse SAND. Gravel is angular to subrounded fine to coarse of limestone and concrete.<br>MADE GROUND |
| | | | | 0.40 | 51.20 | Dark brown gravelly silty fine to coarse SAND with a low cobble content. Gravel is angular to subangular fine to coarse of limestone, concrete, glass, brick fragments and rare plastic. Cobbles are angular to subrounded of concrete and whole bricks.<br>MADE GROUND |
| | | | | 0.60 | 51.00 | Firm dark greyish brown mottled dark grey slightly sandy gravelly CLAY. Gravel is subangular to rounded fine to coarse of brick fragments, concrete and ceramic.<br>MADE GROUND |
| | 0.75 | | HVP=103 | | | Firm becoming stiff dark brown mottled light grey slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to coarse of mudstone and sandstone.<br>GLACIAL TILL |
| | 0.75 | | HVP=108 | | | |
| | 0.75 | | HVP=111 | | | |
| | 0.80 | B | | | | |
| | 1.20 | | HVP=119 | | | |
| | 1.20 | | HVP=139 | | | |
| | 1.20 | | HVP=150 | 1.70 | 49.90 | |
| | 2.00 | B | | | | Light orangish brown gravelly very silty fine to coarse SAND.<br>GLACIAL TILL |
| | | | | 2.20 | 49.40 | |

Trial Pit terminated at 2.20m.

**Water Strike**

| Depth Strike (mbgl) | Remarks |
|---|---|
| | No strike |

**Stability:**

Stable during excavation

**Remarks:**

Trial pit terminated at 2.20m bgl at target depth.

# Trial Pit Photos

**TP05**

Phase 3, Space Project

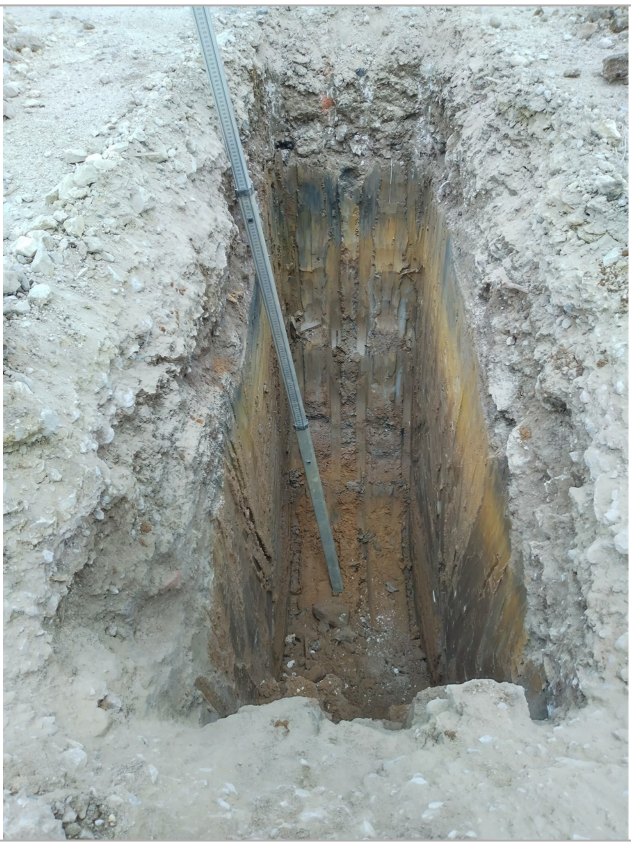

**Image 1.** TP05
*TP05*

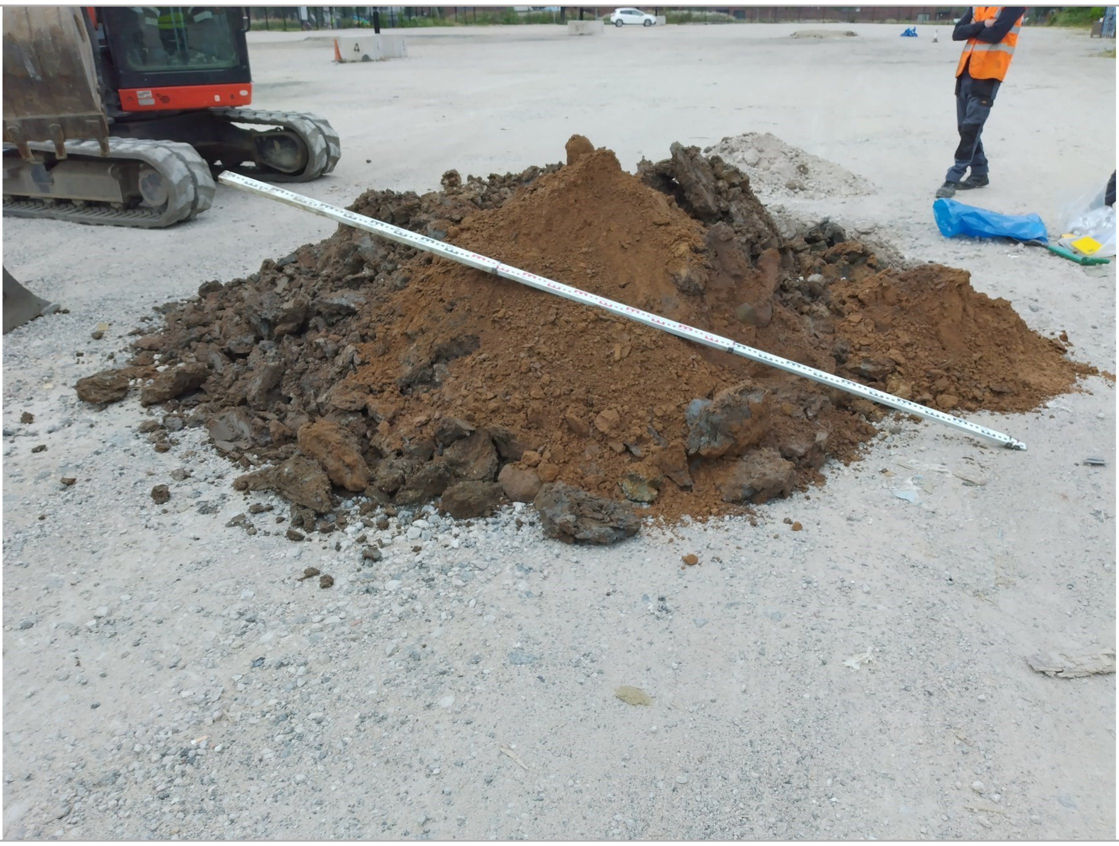

**Image 2.** TP05 SPOIL
*TP05 SPOIL*

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# Trial Pit Log

ver. 1.1

| | | | | | |
|---|---|---|---|---|---|
| **Trial Pit No.** | TP06 | Sheet 1 of 1 | | | |
| **Project Name:** | Phase 3, Space Project | **Level (mAOD):** | 51.60 | **Date:** | 23/06/2021 |
| **Project No.** | 3534 | | | | |
| **Location:** | West Gorton | **Weather:** | Sunny | **Logged By** | LM |
| **Client:** | Manchester City Council | **Co-ords:** | 386823E - 396909N | **Checked By** | AJ |

| Water Strike | Samples & In Situ Testing | | | Depth (mbgl) | Level (mAOD) | Stratum Description |
|---|---|---|---|---|---|---|
| | Depth (m) | Type | Results | | | |
| | 0.05 | ES | | 0.10 | 51.50 | Light grey gravelly silty fine to coarse SAND. Gravel is angular to subrounded fine to coarse of limestone and concrete.<br>MADE GROUND |
| | 0.30 | ES | | 0.40 | 51.20 | Dark grey gravelly silty fine to coarse SAND. Gravel is angular to subrounded fine to coarse of limestone and concrete with rare metal.<br>MADE GROUND |
| | 0.70 | ES | | 0.65 | 50.95 | Dark brown gravelly silty fine to coarse SAND. Gravel is angular fine to coarse of concrete, brick fragments, metal, fabric and plastic.<br>MADE GROUND |
| | | | | 1.05 | 50.55 | Firm dark greyish brown mottled light grey slightly gravelly slightly sandy CLAY. Gravel is angular to subangular fine to coarse of sandstone, mudstone, coal and brick fragments.<br>MADE GROUND |
| | 1.10<br>1.10<br>1.10 | | HVP=111<br>HVP=147<br>HVP=91 | 1.60 | 50.00 | Stiff dark brown mottled light grey slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to coarse of mudstone and sandstone.<br>GLACIAL TILL |
| | | | | 2.10 | 49.50 | Light orangish brown gravelly silty fine to coarse SAND.<br>GLACIAL TILL |
| | | | | | | Trial Pit terminated at 2.10m. |

**Water Strike**

| Depth Strike (mbgl) | Remarks |
|---|---|
| | No strike |

**Stability:**

Stable during excavation

**Remarks:**

Trial pit terminated at 2.10m bgl at target depth.

# Trial Pit Photos

**TP06**

Phase 3, Space Project

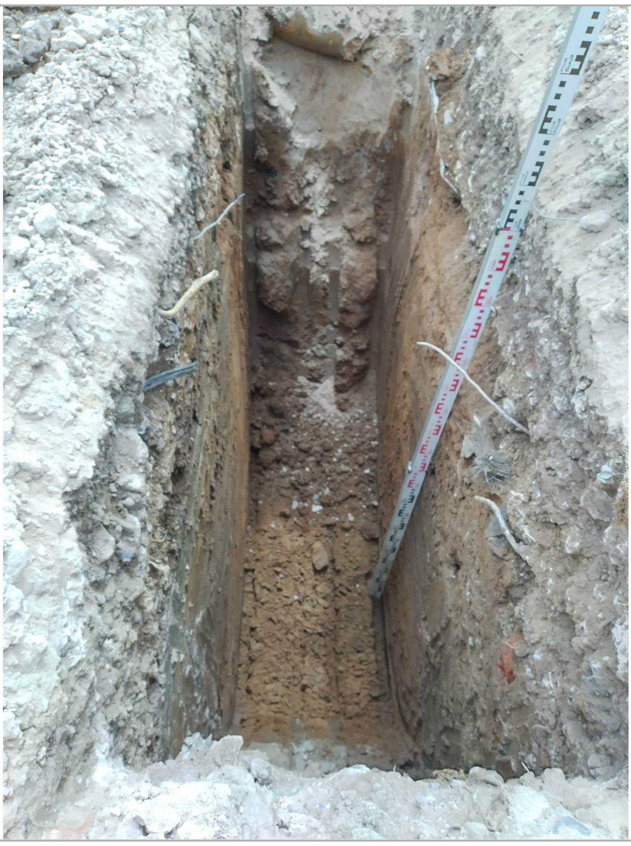

**Image 1.** TP06
*TP06*

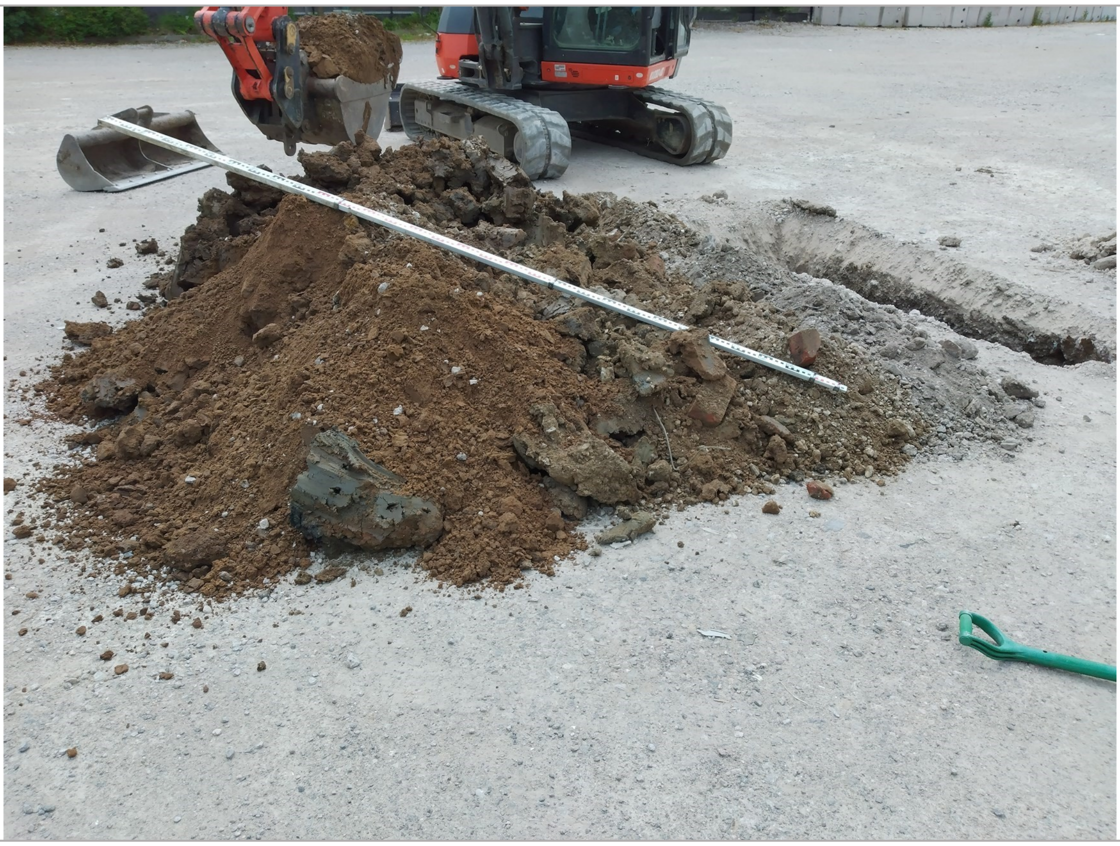

**Image 2.** TP06 SPOIL
*TP06 SPOIL*

| | | | |
|---|---|---|---|
| IGE consulting | Suite 4, 14-32 Hewitt St<br>Manchester, M15 4GB<br>email: contact@igeconsulting.co.uk<br>web: www.igeconsulting.co.uk | # Trial Pit Log<br>ver. 1.1 | **Trial Pit No.**<br>TP07<br>Sheet 1 of 1 |

| | | | | | |
|---|---|---|---|---|---|
| **Project Name:** Phase 3, Space Project | | **Level (mAOD):** 51.63 | **Date:** 23/06/2021 | | **Project No.**<br>3534 |
| **Location:** West Gorton | | **Weather:** Sunny | | | **Logged By**<br>LM |
| **Client:** Manchester City Council | | **Co-ords:** 386845E - 396905N | | | **Checked By**<br>AJ |

| Water Strike | Samples & In Situ Testing | | | Depth (mbgl) | Level (mAOD) | | Stratum Description |
|---|---|---|---|---|---|---|---|
| | Depth (m) | Type | Results | | | | |
| | 0.10 | ES | | 0.15 | 51.48 | | Light grey gravelly silty fine to coarse SAND. Gravel is angular to subrounded fine to coarse of limestone and concrete.<br>MADE GROUND |
| | 0.50 | ES | | 0.60 | 51.03 | | Dark brown gravelly silty fine to coarse SAND with a low cobble content. Gravel is angular to subangular fine to coarse of limestone, concrete, glass, brick fragments and rare plastic. Cobbles are angular to subrounded of concrete and whole bricks.<br>MADE GROUND |
| | 1.10<br>1.10<br>1.10<br>1.10 | ES | <br>HVP=136<br>HVP=152<br>HVP=162 | 1.70 | 49.93 | | Firm becoming stiff dark brown mottled light grey slightly gravelly slightly sandy CLAY. Gravel is angular to subangular fine to coarse of sandstone and mudstone with rare coal.<br>GLACIAL TILL |
| | 1.70 - 2.00 | B | | 2.00 | 49.63 | | Light orangish brown gravelly silty fine to coarse SAND. Gravel is subrounded fine of mudstone.<br>GLACIAL TILL |
| | | | | | | | Trial Pit terminated at 2.00m. |

**Water Strike**

| Depth Strike (mbgl) | Remarks |
|---|---|
| | No strike |

**Stability:**

Stable during excavation

**Remarks:**

Trial pit terminated at 2.0m bgl at target depth.

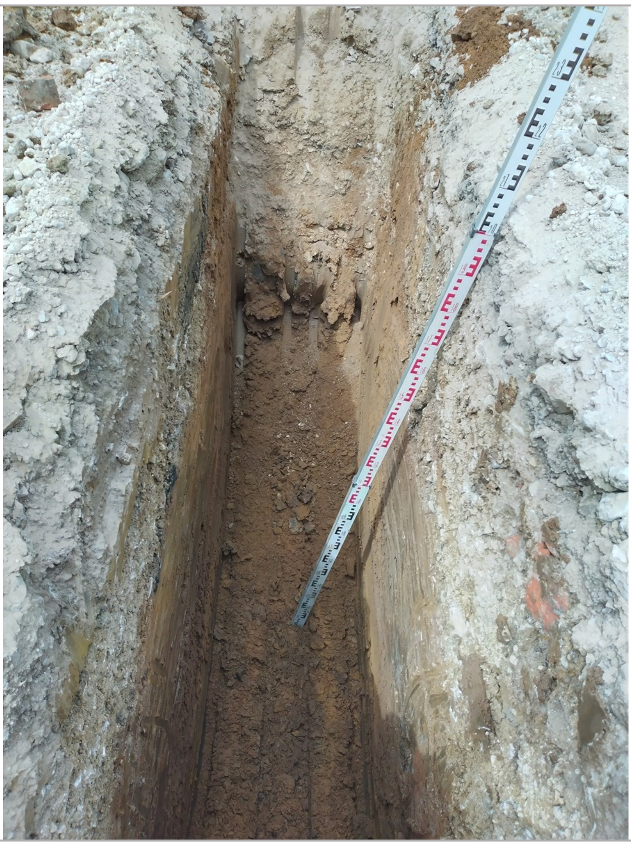

**Image 1.** TP07
*TP07*

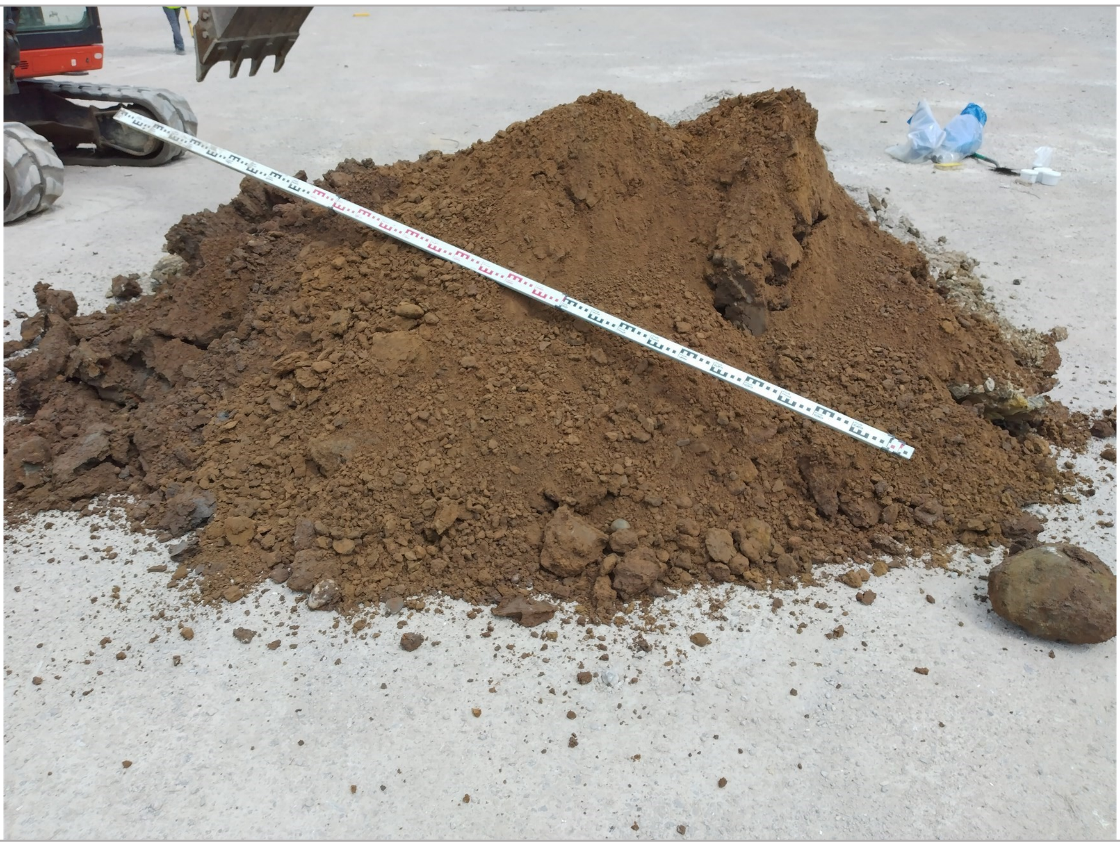

**Image 2.** TP07 SPOIL
*TP07 SPOIL*

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# Trial Pit Log

ver. 1.1

**Trial Pit No.**
TP08
Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| **Project Name:** Phase 3, Space Project | **Level (mAOD):** | 51.64 | **Date:** 23/06/2021 | **Project No.**<br>3534 |
| **Location:** West Gorton | **Weather:** | Sunny | | **Logged By**<br>LM |
| **Client:** Manchester City Council | **Co-ords:** | 386853E - 396927N | | **Checked By**<br>AJ |

| Water Strike | Samples & In Situ Testing | | | Depth (mbgl) | Level (mAOD) | | Stratum Description |
|---|---|---|---|---|---|---|---|
| | Depth (m) | Type | Results | | | | |
| | | | | 0.15 | 51.49 | ▨ | Light grey gravelly silty fine to coarse SAND. Gravel is angular to subrounded fine to coarse of limestone and concrete with rare timber fragments.<br>MADE GROUND |
| | | | | 0.70 | 50.94 | ▨ | Dark brown gravelly silty fine to coarse SAND with a low cobble content. Gravel is angular to subangular fine to coarse of limestone, concrete, glass, brick fragments and rare plastic. Cobbles are angular to subrounded of concrete and whole bricks.<br>MADE GROUND<br>*Suspected CCTV / lighting cable within c. 0.10m diameter ceramic pipe at 0.70m bgl running north west to south east.* |
| | | | | | | | Trial Pit terminated at 0.70m. |

**Water Strike**

| Depth Strike (mbgl) | Remarks |
|---|---|
| | No strike |

**Stability:**
Stable during excavation

**Remarks:**
Trial pit terminated at 0.70m bgl due to suspected CCTV / lighting cable.

| Trial Pit Photos | **TP08** |
|---|---|
| | Phase 3, Space Project |

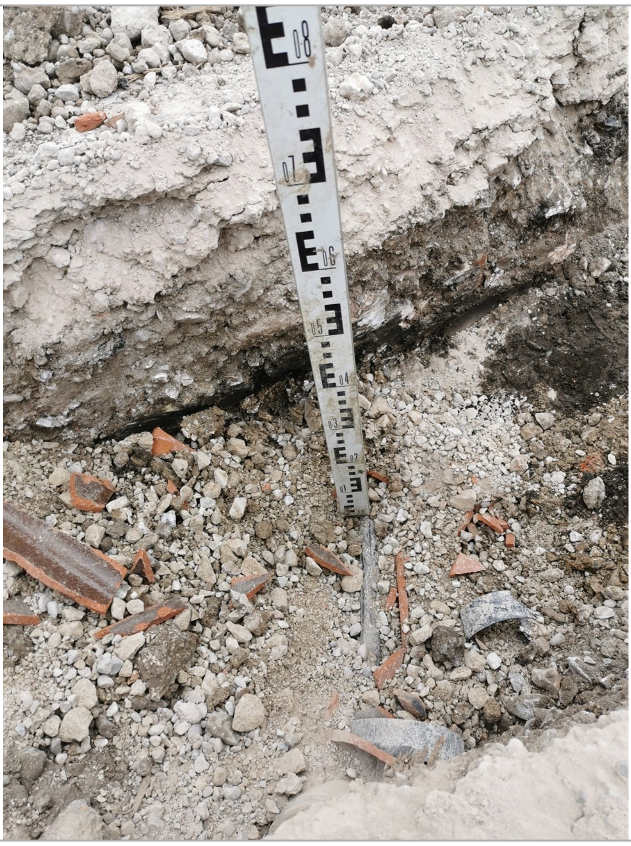
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1

**Image 1.** TP08
*TP08*

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# Trial Pit Log

ver. 1.1

**Trial Pit No.** TP09

Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| **Project Name:** | Phase 3, Space Project | **Level (mAOD):** 51.99 | **Date:** 23/06/2021 | **Project No.** | 3534 |
| **Location:** | West Gorton | **Weather:** | Sunny | **Logged By** | LM |
| **Client:** | Manchester City Council | **Co-ords:** | 386875E - 396913N | **Checked By** | AJ |

| Water Strike | Samples & In Situ Testing Depth (m) | Type | Results |
|---|---|---|---|
| | 0.10 | ES | |
| | 0.40 | ES | |
| | 0.55 | ES | |
| | 0.65 | | HVP=80 |
| | 0.65 | | HVP=86 |
| | 0.65 | | HVP=91 |
| | 0.90 | B | |
| | 1.00 | | HVP=128 |
| | 1.00 | | HVP=133 |
| | 1.00 | | HVP=133 |

| Depth (mbgl) | Level (mAOD) | Stratum Description |
|---|---|---|
| 0.15 | 51.84 | Light grey gravelly silty fine to coarse SAND. Gravel is angular to subrounded fine to coarse of limestone and concrete with rare timber fragments.<br>MADE GROUND |
| 0.50 | 51.49 | Dark brown gravelly silty fine to coarse SAND with a low cobble content. Gravel is angular to subangular fine to coarse of limestone, concrete, glass, brick fragments and rare plastic. Cobbles are angular to subrounded of concrete and whole bricks.<br>MADE GROUND |
| 0.60 | 51.39 | Black gravelly silty fine to coarse ashy SAND. Gravel is angular to subangular fine to coarse of clinker, conrete, glass and brick fragments.<br>MADE GROUND |
| 0.75 | 51.24 | Firm light greyish brown mottled dark grey slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to coarse of concrete, clinker, brick fragments, sandstone, mudstone and coal.<br>MADE GROUND |
| 1.75 | 50.24 | Stiff light orangish brown mottled light grey slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to coarse of sandstone and mudstone.<br>GLACIAL TILL |

Trial Pit terminated at 1.75m.

**Water Strike**

| Depth Strike (mbgl) | Remarks |
|---|---|
| | No strike |

**Stability:**

Stable during excavation

**Remarks:**

Trial pit terminated at 1.75m bgl at target depth.

# Trial Pit Photos

**TP09**

Phase 3, Space Project

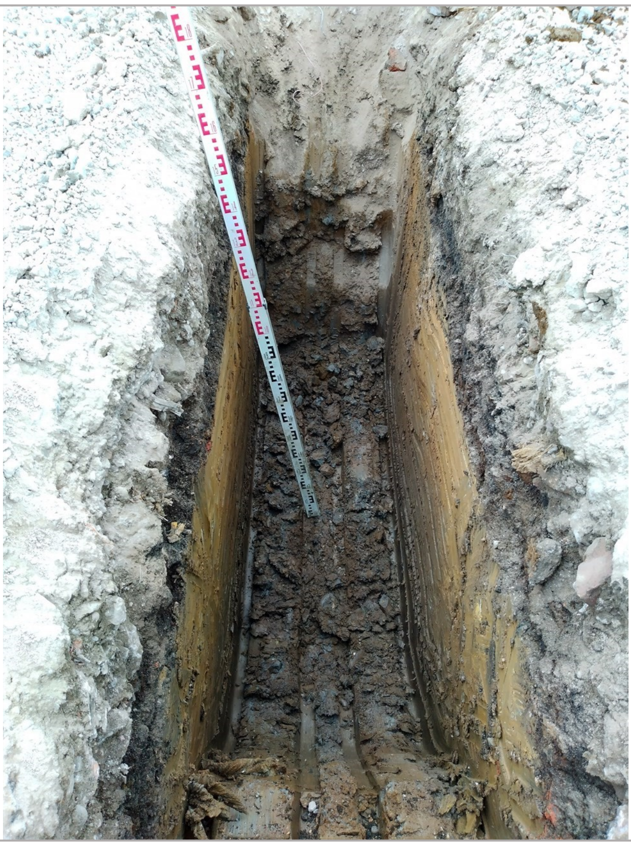

**Image 1.** TP09
*TP09*

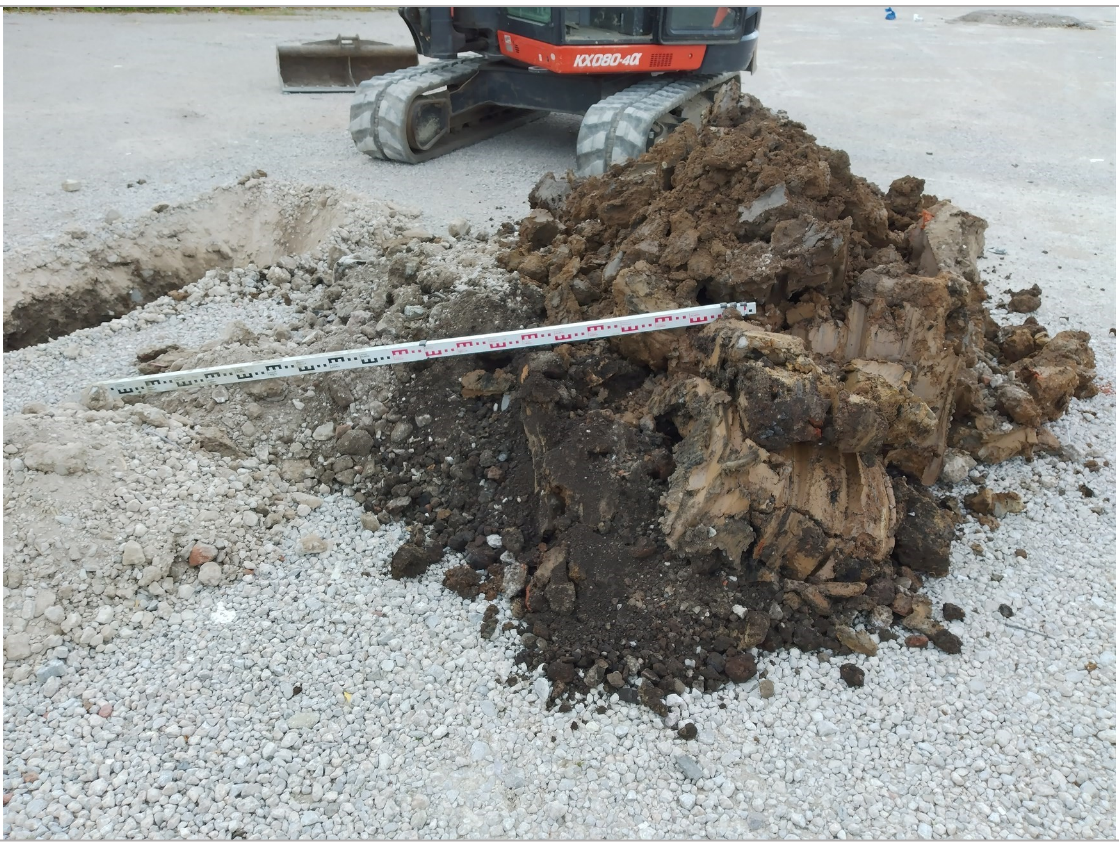

**Image 2.** TP09 SPOIL
*TP09 SPOIL*

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# Trial Pit Log

ver. 1.1

**Trial Pit No.** TP10

Sheet 1 of 1

| | | | |
|---|---|---|---|
| **Project Name:** Phase 3, Space Project | **Level (mAOD):** 51.71 | **Date:** 23/06/2021 | **Project No.** 3534 |
| **Location:** West Gorton | **Weather:** Sunny | | **Logged By** LM |
| **Client:** Manchester City Council | **Co-ords:** 386898E - 396944N | | **Checked By** AJ |

| Water Strike | Samples & In Situ Testing Depth (m) | Type | Results | Depth (mbgl) | Level (mAOD) | Stratum Description |
|---|---|---|---|---|---|---|
| | | | | 0.10 | 51.61 | Light grey gravelly silty fine to coarse SAND. Gravel is angular to subrounded fine to coarse of limestone and concrete.<br>MADE GROUND |
| | 0.25 | ES | | | | |
| | | | | 0.30 | 51.41 | Dark brown sandy silty angular to subangular fine to coarse GRAVEL of limestone, concrete, brick fragments and timber fragments.<br>MADE GROUND |
| | | | | 0.50 | 51.21 | Dark brown gravelly silty fine to coarse SAND. Gravel is angular to subangular fine to coarse of limestone, concrete, clinker, brick fragments, timber and coal.<br>MADE GROUND |
| | 0.60 | B | | | | |
| | 0.60 | ES | | | | |
| | | | | 0.75 | 50.96 | Firm dark greyish brown slightly gravelly sandy CLAY. Gravel is angular to subrounded fine to coarse of mudstone, sandstone, clinker, coal and brick fragments.<br>MADE GROUND |
| | 1.20 | | HVP=128 | | | |
| | 1.20 | | HVP=130 | | | |
| | 1.20 | | HVP=141 | | | |
| | | | | 1.75 | 49.96 | Stiff light orangish brown mottled dark grey slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to coarse of sandstone and mudstone.<br>GLACIAL TILL |
| | | | | | | Trial Pit terminated at 1.75m. |

**Water Strike**

| Depth Strike (mbgl) | Remarks |
|---|---|
| | No strike |

**Stability:**

Stable during excavation

**Remarks:**

Trial pit terminated at 1.75m bgl at target depth.

# Trial Pit Photos

**TP10**

Phase 3, Space Project

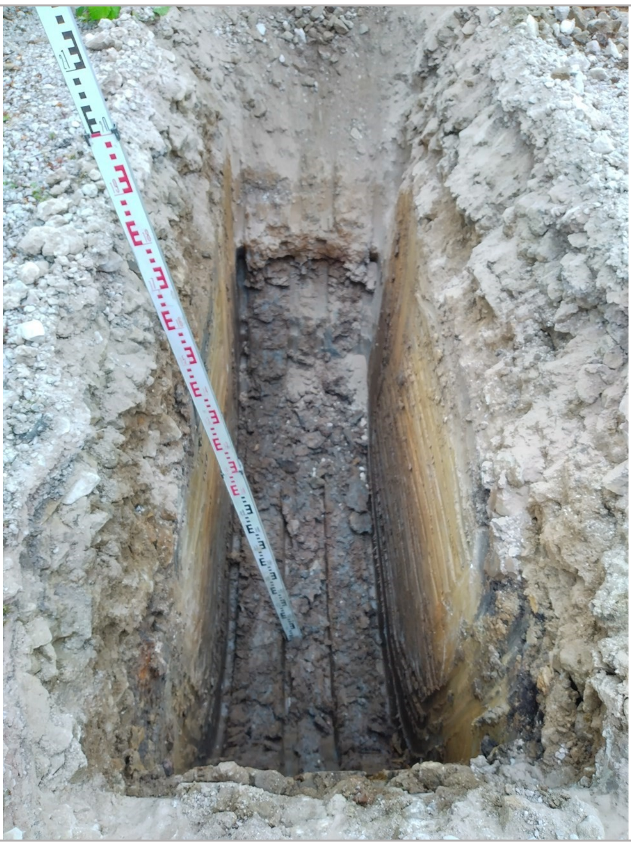

**Image 1.** TP10
*TP10*

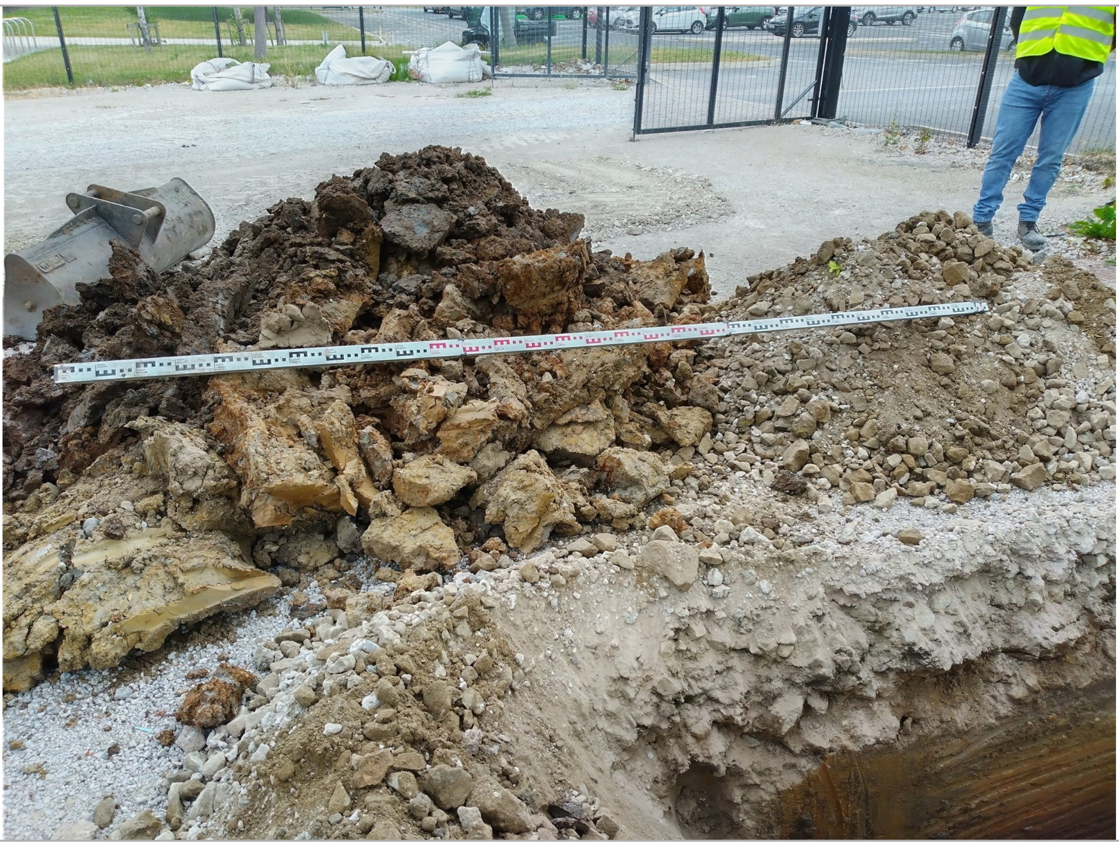

**Image 2.** TP10 SPOIL
*TP10 SPOIL*

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# Trial Pit Log

ver. 1.1

**Trial Pit No.** TP11

Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| **Project Name:** | Phase 3, Space Project | **Level (mAOD):** | 52.82 | **Date:** | 23/06/2021 |
| **Location:** | West Gorton | **Weather:** | Sunny | | |
| **Client:** | Manchester City Council | **Co-ords:** | 386917E - 396925N | | |

**Project No.** 3534

**Logged By** LM

**Checked By** AJ

| Water Strike | Samples & In Situ Testing | | | Depth (mbgl) | Level (mAOD) | | Stratum Description |
|---|---|---|---|---|---|---|---|
| | Depth (m) | Type | Results | | | | |
| | | | | 0.15 | 52.67 | ▨ | Soft light brown sandy CLAY with occasional roots and rootlets.<br>TOPSOIL |
| | 0.60<br>0.60 | B<br>ES | | 1.20 | 51.62 | ▨ | Soft dark brown slightly sandy gravelly CLAY. Gravel is angular to subangular fine to coarse of mudstone, sandystone, concrete, clinker, brick fragments, timbre fragments, coal, metal, fabric and plastic.<br>MADE GROUND<br>*Geotextile membrane at 0.15m bgl.* |
| | | | | | | | Trial Pit terminated at 1.20m. |

1
2
3
4
5

**Water Strike**

| Depth Strike (mbgl) | Remarks |
|---|---|
| | No strike |

**Stability:**
Stable during excavation

**Remarks:**
Trial pit terminated at 1.20m bgl due to hard digging / obstruction.

# Trial Pit Photos

## TP11

Phase 3, Space Project

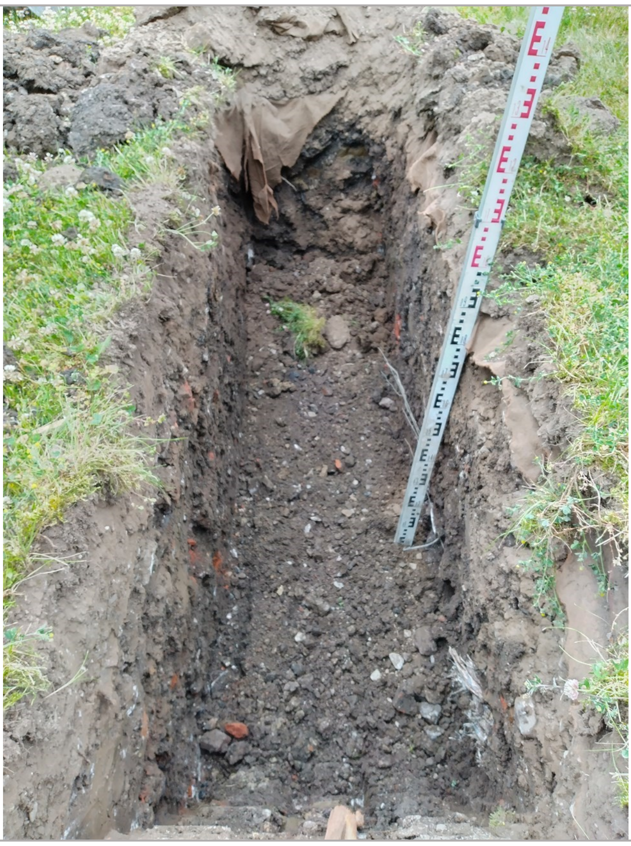

**Image 1.** TP11
*TP11*

**Image 2.** TP11 SPOIL
*TP11 SPOIL*

# APPENDIX 8

# DYNAMIC CONE PENETROMETER (DCP) TEST RESULTS

# DYNAMIC CONE PENETROMETER TEST RESULTS

IGE
consulting

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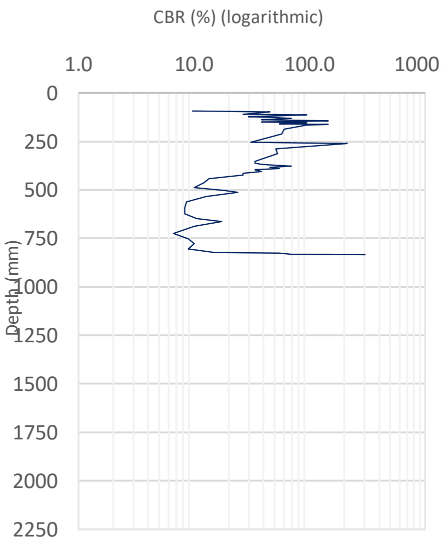
14-32 Hewitt Street
Manchester
M15 4GB

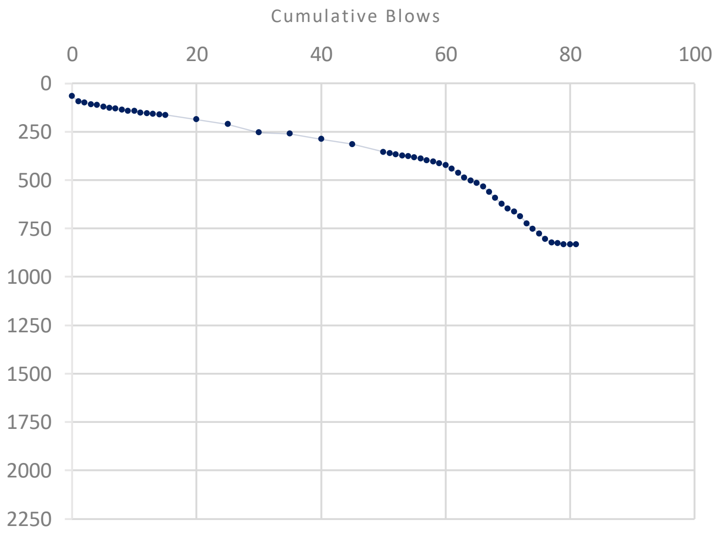
Tel: 0161 237 9310
Email: contact@igeconsulting.co.uk
Web: www.igeconsulting.co.uk

| | |
|---|---|
| **Site:** | Space Project, West Gorton |
| **Test Date:** | 25/06/2021 |
| **Location:** | DCP01 |
| **Weather:** | Overcast |
| **Surface Covering:** | Grass |
| **Start Depth (mm):** | 67 |
| **Final Depth (mm):** | 834 |
| **Interpretative Method:** | TRL Equation: $\text{Log}_{10}$ (CBR) = 2.480 – 1.057 x $\text{Log}_{10}$(mm/blow) |
| **Termination Reason:** | Target depth reached |

| Layer | Cumulative Blows | Total Depth (mm) | Layer Thickness * (mm) | CBR Value (%) |
|---|---|---|---|---|
| 1 | 60 | 424 | 357 | 45.8 |
| 2 | 77 | 822 | 398 | 10.8 |
| 3 | 81 | 834 | 12 | 94.6 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

** Layers determined by discernible change in CBR % or by each 250mm compacted layer.*





*Method in line with DTP Interim Advice Note 73/06 (Rev 1) (2009) – Design Guidance For Road Pavement Foundations (Draft 25)*

# DYNAMIC CONE PENETROMETER TEST RESULTS

**Suite 4**
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| | |
|---|---|
| **Site:** | Space Project, West Gorton |
| **Test Date:** | 25/06/2021 |
| **Location:** | DCP02 |
| **Weather:** | Overcast |
| **Surface Covering:** | Grass |
| **Start Depth (mm):** | 62 |
| **Final Depth (mm):** | 708 |
| **Interpretative Method:** | TRL Equation: $\text{Log}_{10}$ (CBR) = 2.480 – 1.057 x $\text{Log}_{10}$(mm/blow) |
| **Termination Reason:** | Target depth reached |

| Layer | Cumulative Blows | Total Depth (mm) | Layer Thickness * (mm) | CBR Value (%) |
|---|---|---|---|---|
| 1 | 9 | 294 | 232 | 9.7 |
| 2 | 105 | 708 | 414 | 64.4 |
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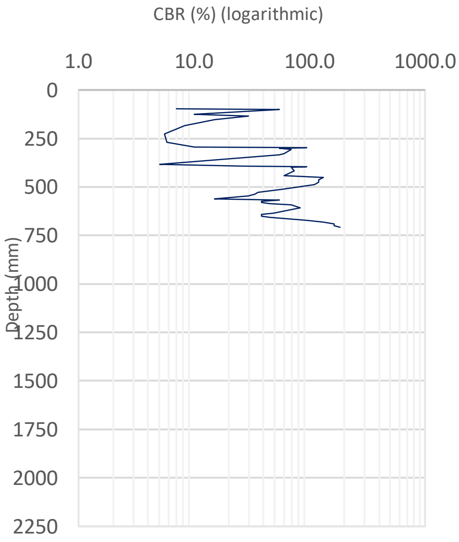
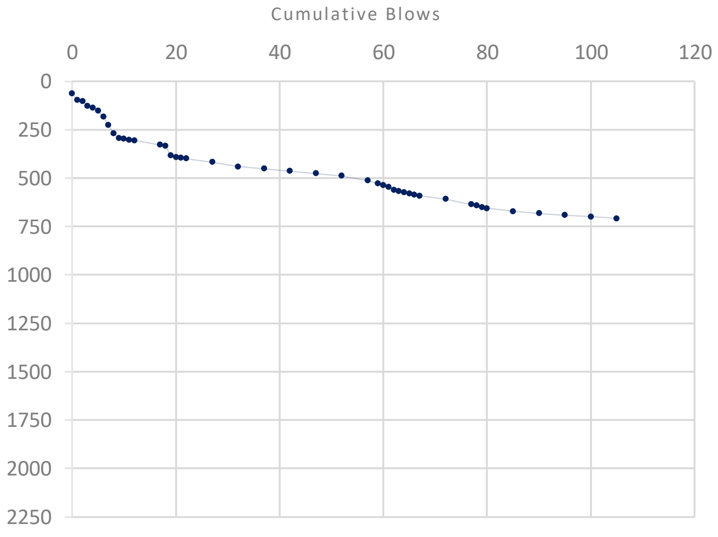
** Layers determined by discernible change in CBR % or by each 250mm compacted layer.*





*Method in line with DTP Interim Advice Note 73/06 (Rev 1) (2009) – Design Guidance For Road Pavement Foundations (Draft 25)*

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| | |
|---|---|
| **Site:** | Space Project, West Gorton |
| **Test Date:** | 25/06/2021 |
| **Location:** | DCP04 |
| **Weather:** | Overcast |
| **Surface Covering:** | Grass |
| **Start Depth (mm):** | 53 |
| **Final Depth (mm):** | 922 |
| **Interpretative Method:** | TRL Equation: $Log_{10}$ (CBR) = 2.480 – 1.057 x $Log_{10}$(mm/blow) |
| **Termination Reason:** | Target depth reached |

| Layer | Cumulative Blows | Total Depth (mm) | Layer Thickness * (mm) | CBR Value (%) |
|---|---|---|---|---|
| 1 | 5 | 237 | 184 | 6.7 |
| 2 | 12 | 307 | 70 | 26.5 |
| 3 | 16 | 512 | 205 | 4.7 |
| 4 | 39 | 922 | 410 | 14.4 |
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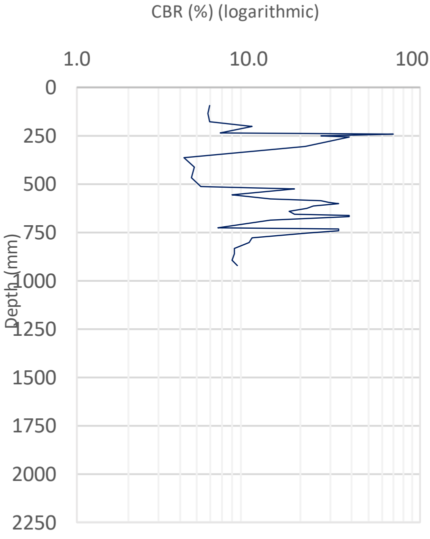
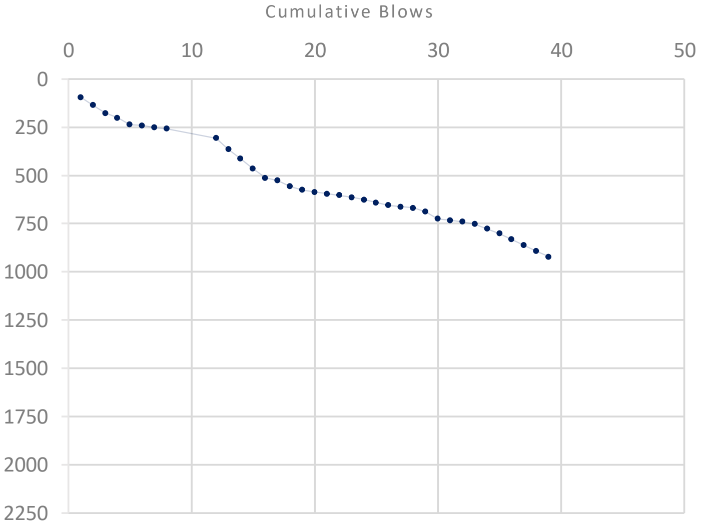
** Layers determined by discernible change in CBR % or by each 250mm compacted layer.*





*Method in line with DTP Interim Advice Note 73/06 (Rev 1) (2009) – Design Guidance For Road Pavement Foundations (Draft 25)*

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| | |
|---|---|
| **Site:** | Space Project, West Gorton |
| **Test Date:** | 25/06/2021 |
| **Location:** | DCP03 |
| **Weather:** | Overcast |
| **Surface Covering:** | Grass |
| **Start Depth (mm):** | 51 |
| **Final Depth (mm):** | 935 |
| **Interpretative Method:** | TRL Equation: Log$_{10}$ (CBR) = 2.480 – 1.057 x Log$_{10}$(mm/blow) |
| **Termination Reason:** | Target depth reached |

| Layer | Cumulative Blows | Total Depth (mm) | Layer Thickness * (mm) | CBR Value (%) |
|---|---|---|---|---|
| 1 | 22 | 417 | 366 | 15.5 |
| 2 | 56 | 649 | 232 | 39.7 |
| 3 | 76 | 935 | 286 | 18.1 |
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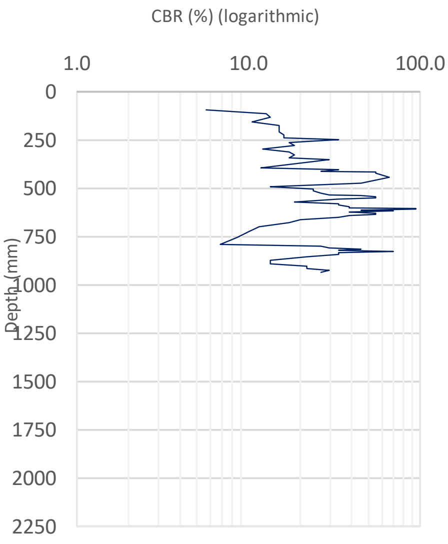
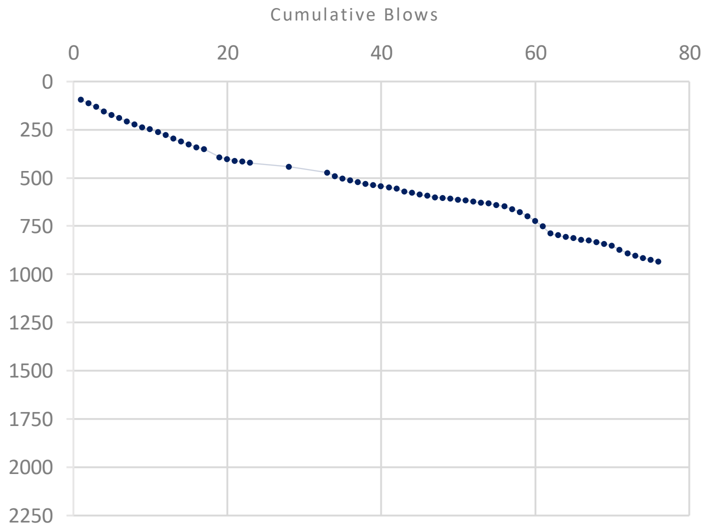
** Layers determined by discernible change in CBR % or by each 250mm compacted layer.*





*Method in line with DTP Interim Advice Note 73/06 (Rev 1) (2009) – Design Guidance For Road Pavement Foundations (Draft 25)*

# APPENDIX 9

# ENVIRONMENTAL LABORATORY TEST RESULTS

**Liam McMahon**
IGE Consulting
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**e:** liammcmahon@igeconsulting.co.uk

# Analytical Report Number : 21-84269

| | | | |
|---|---|---|---|
| **Project / Site name:** | Space Project | **Samples received on:** | 29/06/2021 |
| **Your job number:** | 3534 | **Samples instructed on/ Analysis started on:** | 30/06/2021 |
| **Your order number:** | 300621 02 | **Analysis completed by:** | 07/07/2021 |
| **Report Issue Number:** | 1 | **Report issued on:** | 07/07/2021 |
| **Samples Analysed:** | 30 soil samples | | |

**Signed:** Karoline Marek

Karolina Marek
PL Head of Reporting Team
**For & on behalf of i2 Analytical Ltd.**

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

**Analytical Report Number: 21-84269**
**Project / Site name: Space Project**
**Your Order No: 300621 02**

| **Lab Sample Number** | | | | 1922541 | 1922542 | 1922543 | 1922544 | 1922545 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP01 | WS06 | TP03 | TP06 | TP07 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 1.55 | 1.00 | 1.30 | 0.70 | 1.10 |
| **Date Sampled** | | | | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **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 |
| Moisture Content | % | 0.01 | NONE | 25 | 8.4 | 15 | 18 | 15 |
| Total mass of sample received | kg | 0.001 | NONE | 1.2 | 0.50 | 1.2 | 1.2 | 1.2 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Asbestos in Soil Screen / Identification Name | Type | N/A | ISO 17025 | - | - | - | - | - |
| Asbestos in Soil | Type | N/A | ISO 17025 | - | - | - | - | - |
| Asbestos Quantification (Stage 2) | % | 0.001 | ISO 17025 | - | - | - | - | - |
| Asbestos Quantification Total | % | 0.001 | ISO 17025 | - | - | - | - | - |

**General Inorganics**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| pH - Automated | pH Units | N/A | MCERTS | 8.1 | 9.3 | 7.9 | 7.5 | 7.4 |
| Total Cyanide | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Free Cyanide | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Total Sulphate as SO4 | % | 0.005 | MCERTS | - | - | - | - | - |
| Water Soluble Sulphate as SO4 16hr extraction (2:1) | mg/kg | 2.5 | MCERTS | 1000 | 3800 | 290 | 720 | 310 |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | 0.50 | 1.9 | 0.15 | 0.36 | 0.15 |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | mg/l | 1.25 | MCERTS | 498 | 1910 | 146 | 362 | 154 |
| Water Soluble Chloride (2:1) (leachate equivalent) | mg/l | 0.5 | MCERTS | - | - | - | - | - |
| Total Sulphur | % | 0.005 | MCERTS | - | - | - | - | - |
| Ammoniacal Nitrogen as NH4 | mg/kg | 0.5 | MCERTS | - | - | - | - | - |
| Ammonium as NH4 (10:1 leachate equivalent) | mg/l | 0.05 | MCERTS | - | - | - | - | - |
| Organic Matter | % | 0.1 | MCERTS | 3.0 | 2.9 | 1.1 | 1.3 | 0.9 |
| Total Organic Carbon (TOC) | % | 0.1 | MCERTS | 1.7 | 1.7 | 0.6 | 0.8 | 0.5 |
| Water Soluble Nitrate (2:1) as N (leachate equivalent) | mg/l | 2 | NONE | - | - | - | - | - |
| Water Soluble Nitrate (2:1) as NO3 | mg/kg | 2 | NONE | 3.0 | 3.1 | 20 | 3.3 | 3.2 |
| Water Soluble Nitrate (2:1) as NO3 (leachate equivalent) | mg/l | 5 | NONE | < 5.0 | < 5.0 | 10 | < 5.0 | < 5.0 |

**Speciated PAHs**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Naphthalene | mg/kg | 0.05 | MCERTS | < 0.05 | 1.3 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.43 | < 0.05 | < 0.05 | < 0.05 |
| Fluorene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.24 | < 0.05 | < 0.05 | < 0.05 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | < 0.05 | 4.2 | < 0.05 | < 0.05 | < 0.05 |
| Anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | 1.1 | < 0.05 | < 0.05 | < 0.05 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | 0.32 | 13 | < 0.05 | < 0.05 | < 0.05 |
| Pyrene | mg/kg | 0.05 | MCERTS | 0.34 | 12 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | 6.9 | < 0.05 | < 0.05 | < 0.05 |
| Chrysene | mg/kg | 0.05 | MCERTS | < 0.05 | 4.7 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | 6.8 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | 2.7 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | 6.5 | < 0.05 | < 0.05 | < 0.05 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | 3.1 | < 0.05 | < 0.05 | < 0.05 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.93 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | < 0.05 | 4.1 | < 0.05 | < 0.05 | < 0.05 |

**Total PAH**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | MCERTS | < 0.80 | 68.0 | < 0.80 | < 0.80 | < 0.80 |

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The results included within the report relate only to the sample(s) submitted for testing.

**Analytical Report Number: 21-84269**
**Project / Site name: Space Project**
**Your Order No: 300621 02**

| **Lab Sample Number** | | | | 1922541 | 1922542 | 1922543 | 1922544 | 1922545 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP01 | WS06 | TP03 | TP06 | TP07 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 1.55 | 1.00 | 1.30 | 0.70 | 1.10 |
| **Date Sampled** | | | | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 23 | 25 | 11 | 12 | 9.6 |
| Barium (aqua regia extractable) | mg/kg | 1 | MCERTS | 170 | 530 | 410 | 110 | 140 |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | 1.0 | 1.1 | 1.5 | 1.0 | 1.5 |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | 4.2 | 1.7 | 0.4 | 0.4 | 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 | 1.2 | MCERTS | < 1.2 | < 1.2 | < 1.2 | < 1.2 | < 1.2 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 22 | 20 | 37 | 26 | 25 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 160 | 88 | 28 | 70 | 26 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 110 | 490 | 15 | 26 | 14 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 21 | 22 | 45 | 23 | 26 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | 32 | 30 | 39 | 40 | 28 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 68 | 250 | 73 | 52 | 57 |
| | | | | | | | | |
| Magnesium (water soluble) | mg/kg | 5 | NONE | - | - | - | - | - |
| Magnesium (leachate equivalent) | mg/l | 2.5 | NONE | - | - | - | - | - |
| **Petroleum Hydrocarbons** | | | | | | | | |
| Petroleum Range Organics (C6 - C10) | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| | | | | | | | | |
| TPH C10 - C40 | mg/kg | 10 | MCERTS | 23 | 310 | < 10 | 21 | < 10 |
| | | | | | | | | |
| TPH2 (C6 - C10) | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| | | | | | | | | |
| TPH C6 - C40 | mg/kg | 10 | NONE | 23 | 310 | < 10 | 21 | < 10 |
| | | | | | | | | |
| TPH (C10 - C25) | mg/kg | 10 | MCERTS | 12 | 150 | < 10 | < 10 | < 10 |
| TPH (C25 - C40) | mg/kg | 10 | MCERTS | 10 | 160 | < 10 | 16 | < 10 |

U/S = Unsuitable Sample    I/S = Insufficient Sample

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**Analytical Report Number: 21-84269**
**Project / Site name: Space Project**
**Your Order No: 300621 02**

| **Lab Sample Number** | | | | 1922546 | 1922547 | 1922548 | 1922549 | 1922550 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP09 | TP10 | TP11 | TP01 | TP02 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.55 | 0.60 | 0.60 | 0.35 | 0.75 |
| **Date Sampled** | | | | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| Stone Content | % | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | - | - |
| Moisture Content | % | 0.01 | NONE | 13 | 12 | 10 | - | - |
| Total mass of sample received | kg | 0.001 | NONE | 1.0 | 1.2 | 1.2 | - | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Asbestos in Soil Screen / Identification Name | Type | N/A | ISO 17025 | - | - | - | Chrysotile | - |
| Asbestos in Soil | Type | N/A | ISO 17025 | - | - | - | Detected | Not-detected |
| Asbestos Quantification (Stage 2) | % | 0.001 | ISO 17025 | - | - | - | < 0.001 | - |
| Asbestos Quantification Total | % | 0.001 | ISO 17025 | - | - | - | < 0.001 | - |

**General Inorganics**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| pH - Automated | pH Units | N/A | MCERTS | 8.2 | 6.9 | 8.6 | - | - |
| Total Cyanide | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | - | - |
| Free Cyanide | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | - | - |
| Total Sulphate as SO4 | % | 0.005 | MCERTS | - | - | - | - | - |
| Water Soluble Sulphate as SO4 16hr extraction (2:1) | mg/kg | 2.5 | MCERTS | 670 | 530 | 830 | - | - |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | 0.33 | 0.26 | 0.41 | - | - |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | mg/l | 1.25 | MCERTS | 334 | 264 | 414 | - | - |
| Water Soluble Chloride (2:1) (leachate equivalent) | mg/l | 0.5 | MCERTS | - | - | - | - | - |
| Total Sulphur | % | 0.005 | MCERTS | - | - | - | - | - |
| Ammoniacal Nitrogen as NH4 | mg/kg | 0.5 | MCERTS | - | - | - | - | - |
| Ammonium as NH4 (10:1 leachate equivalent) | mg/l | 0.05 | MCERTS | - | - | - | - | - |
| Organic Matter | % | 0.1 | MCERTS | 5.0 | 1.2 | 1.9 | - | - |
| Total Organic Carbon (TOC) | % | 0.1 | MCERTS | 2.9 | 0.7 | 1.1 | - | - |
| Water Soluble Nitrate (2:1) as N (leachate equivalent) | mg/l | 2 | NONE | - | - | - | - | - |
| Water Soluble Nitrate (2:1) as NO3 | mg/kg | 2 | NONE | 6.2 | 11 | 7.9 | - | - |
| Water Soluble Nitrate (2:1) as NO3 (leachate equivalent) | mg/l | 5 | NONE | < 5.0 | 5.4 | < 5.0 | - | - |

**Speciated PAHs**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Naphthalene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | - | - |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | - | - |
| Acenaphthene | mg/kg | 0.05 | MCERTS | 0.32 | < 0.05 | 0.35 | - | - |
| Fluorene | mg/kg | 0.05 | MCERTS | 0.26 | < 0.05 | 0.26 | - | - |
| Phenanthrene | mg/kg | 0.05 | MCERTS | 3.8 | < 0.05 | 2.4 | - | - |
| Anthracene | mg/kg | 0.05 | MCERTS | 1.1 | < 0.05 | 0.73 | - | - |
| Fluoranthene | mg/kg | 0.05 | MCERTS | 5.4 | < 0.05 | 3.6 | - | - |
| Pyrene | mg/kg | 0.05 | MCERTS | 6.1 | < 0.05 | 3.7 | - | - |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | 3.5 | < 0.05 | 1.5 | - | - |
| Chrysene | mg/kg | 0.05 | MCERTS | 3.1 | < 0.05 | 1.6 | - | - |
| Benzo(b)fluoranthene | mg/kg | 0.05 | MCERTS | 4.5 | < 0.05 | 1.7 | - | - |
| Benzo(k)fluoranthene | mg/kg | 0.05 | MCERTS | 1.5 | < 0.05 | 0.69 | - | - |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | 4.7 | < 0.05 | 1.5 | - | - |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | 2.9 | < 0.05 | 0.85 | - | - |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | 0.77 | < 0.05 | 0.29 | - | - |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | 3.7 | < 0.05 | 1.0 | - | - |

**Total PAH**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | MCERTS | 41.6 | < 0.80 | 20.1 | - | - |

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**Analytical Report Number: 21-84269**
**Project / Site name: Space Project**
**Your Order No: 300621 02**

| **Lab Sample Number** | | | | 1922546 | 1922547 | 1922548 | 1922549 | 1922550 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP09 | TP10 | TP11 | TP01 | TP02 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.55 | 0.60 | 0.60 | 0.35 | 0.75 |
| **Date Sampled** | | | | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 35 | 8.3 | 20 | - | - |
| Barium (aqua regia extractable) | mg/kg | 1 | MCERTS | 220 | 68 | 170 | - | - |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | 0.54 | 0.58 | 0.98 | - | - |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | 1.1 | 0.5 | 1.1 | - | - |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | - | - |
| Chromium (hexavalent) | mg/kg | 1.2 | MCERTS | < 1.2 | < 1.2 | < 1.2 | - | - |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 31 | 15 | 24 | - | - |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 300 | 22 | 310 | - | - |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 110 | 43 | 170 | - | - |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | - | - |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 39 | 12 | 26 | - | - |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | - | - |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | 70 | 21 | 33 | - | - |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 99 | 53 | 150 | - | - |
| | | | | | | | | |
| Magnesium (water soluble) | mg/kg | 5 | NONE | - | - | - | - | - |
| Magnesium (leachate equivalent) | mg/l | 2.5 | NONE | - | - | - | - | - |
| | | | | | | | | |
| **Petroleum Hydrocarbons** | | | | | | | | |
| Petroleum Range Organics (C6 - C10) | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | - | - |
| | | | | | | | | |
| TPH C10 - C40 | mg/kg | 10 | MCERTS | 130 | < 10 | 220 | - | - |
| | | | | | | | | |
| TPH2 (C6 - C10) | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | - | - |
| | | | | | | | | |
| TPH C6 - C40 | mg/kg | 10 | NONE | 130 | < 10 | 220 | - | - |
| | | | | | | | | |
| TPH (C10 - C25) | mg/kg | 10 | MCERTS | 62 | < 10 | 78 | - | - |
| TPH (C25 - C40) | mg/kg | 10 | MCERTS | 65 | < 10 | 140 | - | - |

U/S = Unsuitable Sample    I/S = Insufficient Sample

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**Analytical Report Number: 21-84269**
**Project / Site name: Space Project**
**Your Order No: 300621 02**

| **Lab Sample Number** | | | | 1922551 | 1922552 | 1922553 | 1922554 | 1922555 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP04 | WS07 | WS06 | WS05 | TP05 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.40 | 0.20 | 0.50 | 0.30 | 0.10 |
| **Date Sampled** | | | | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| Stone Content | % | 0.1 | NONE | - | - | - | - | - |
| Moisture Content | % | 0.01 | NONE | - | - | - | - | - |
| Total mass of sample received | kg | 0.001 | NONE | - | - | - | - | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Asbestos in Soil Screen / Identification Name | Type | N/A | ISO 17025 | - | - | - | - | - |
| Asbestos in Soil | Type | N/A | ISO 17025 | Not-detected | Not-detected | Not-detected | Not-detected | Not-detected |
| Asbestos Quantification (Stage 2) | % | 0.001 | ISO 17025 | - | - | - | - | - |
| Asbestos Quantification Total | % | 0.001 | ISO 17025 | - | - | - | - | - |

**General Inorganics**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| pH - Automated | pH Units | N/A | MCERTS | - | - | - | - | - |
| Total Cyanide | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Free Cyanide | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Total Sulphate as SO4 | % | 0.005 | MCERTS | - | - | - | - | - |
| Water Soluble Sulphate as SO4 16hr extraction (2:1) | mg/kg | 2.5 | MCERTS | - | - | - | - | - |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | - | - | - | - | - |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | mg/l | 1.25 | MCERTS | - | - | - | - | - |
| Water Soluble Chloride (2:1) (leachate equivalent) | mg/l | 0.5 | MCERTS | - | - | - | - | - |
| Total Sulphur | % | 0.005 | MCERTS | - | - | - | - | - |
| Ammoniacal Nitrogen as NH4 | mg/kg | 0.5 | MCERTS | - | - | - | - | - |
| Ammonium as NH4 (10:1 leachate equivalent) | mg/l | 0.05 | MCERTS | - | - | - | - | - |
| Organic Matter | % | 0.1 | MCERTS | - | - | - | - | - |
| Total Organic Carbon (TOC) | % | 0.1 | MCERTS | - | - | - | - | - |
| Water Soluble Nitrate (2:1) as N (leachate equivalent) | mg/l | 2 | NONE | - | - | - | - | - |
| Water Soluble Nitrate (2:1) as NO3 | mg/kg | 2 | NONE | - | - | - | - | - |
| Water Soluble Nitrate (2:1) as NO3 (leachate equivalent) | mg/l | 5 | NONE | - | - | - | - | - |

**Speciated PAHs**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Naphthalene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Acenaphthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Fluorene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Phenanthrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Anthracene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Fluoranthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Pyrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Chrysene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(b)fluoranthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(k)fluoranthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |

**Total PAH**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | MCERTS | - | - | - | - | - |

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**Analytical Report Number: 21-84269**
**Project / Site name: Space Project**
**Your Order No: 300621 02**

| **Lab Sample Number** | | | | 1922551 | 1922552 | 1922553 | 1922554 | 1922555 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP04 | WS07 | WS06 | WS05 | TP05 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.40 | 0.20 | 0.50 | 0.30 | 0.10 |
| **Date Sampled** | | | | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Barium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | - | - | - | - | - |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | - | - | - | - | - |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | - | - | - | - | - |
| Chromium (hexavalent) | mg/kg | 1.2 | MCERTS | - | - | - | - | - |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | - | - | - | - | - |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| | | | | | | | | |
| Magnesium (water soluble) | mg/kg | 5 | NONE | - | - | - | - | - |
| Magnesium (leachate equivalent) | mg/l | 2.5 | NONE | - | - | - | - | - |
| | | | | | | | | |
| **Petroleum Hydrocarbons** | | | | | | | | |
| Petroleum Range Organics (C6 - C10) | mg/kg | 0.1 | MCERTS | - | - | - | - | - |
| | | | | | | | | |
| TPH C10 - C40 | mg/kg | 10 | MCERTS | - | - | - | - | - |
| | | | | | | | | |
| TPH2 (C6 - C10) | mg/kg | 0.1 | MCERTS | - | - | - | - | - |
| | | | | | | | | |
| TPH C6 - C40 | mg/kg | 10 | NONE | - | - | - | - | - |
| | | | | | | | | |
| TPH (C10 - C25) | mg/kg | 10 | MCERTS | - | - | - | - | - |
| TPH (C25 - C40) | mg/kg | 10 | MCERTS | - | - | - | - | - |

U/S = Unsuitable Sample    I/S = Insufficient Sample

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**Analytical Report Number: 21-84269**
**Project / Site name: Space Project**
**Your Order No: 300621 02**

| **Lab Sample Number** | | | | 1922556 | 1922557 | 1922558 | 1922559 | 1922560 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP05 | WS04 | TP06 | TP07 | WS01 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.25 | 0.45 | 0.05 | 0.10 | 0.25 |
| **Date Sampled** | | | | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| Stone Content | % | 0.1 | NONE | - | - | - | - | - |
| Moisture Content | % | 0.01 | NONE | - | - | - | - | - |
| Total mass of sample received | kg | 0.001 | NONE | - | - | - | - | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Asbestos in Soil Screen / Identification Name | Type | N/A | ISO 17025 | - | - | - | - | - |
| Asbestos in Soil | Type | N/A | ISO 17025 | Not-detected | Not-detected | Not-detected | Not-detected | Not-detected |
| Asbestos Quantification (Stage 2) | % | 0.001 | ISO 17025 | - | - | - | - | - |
| Asbestos Quantification Total | % | 0.001 | ISO 17025 | - | - | - | - | - |

### General Inorganics

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| pH - Automated | pH Units | N/A | MCERTS | - | - | - | - | - |
| Total Cyanide | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Free Cyanide | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Total Sulphate as SO4 | % | 0.005 | MCERTS | - | - | - | - | - |
| Water Soluble Sulphate as SO4 16hr extraction (2:1) | mg/kg | 2.5 | MCERTS | - | - | - | - | - |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | - | - | - | - | - |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | mg/l | 1.25 | MCERTS | - | - | - | - | - |
| Water Soluble Chloride (2:1) (leachate equivalent) | mg/l | 0.5 | MCERTS | - | - | - | - | - |
| Total Sulphur | % | 0.005 | MCERTS | - | - | - | - | - |
| Ammoniacal Nitrogen as NH4 | mg/kg | 0.5 | MCERTS | - | - | - | - | - |
| Ammonium as NH4 (10:1 leachate equivalent) | mg/l | 0.05 | MCERTS | - | - | - | - | - |
| Organic Matter | % | 0.1 | MCERTS | - | - | - | - | - |
| Total Organic Carbon (TOC) | % | 0.1 | MCERTS | - | - | - | - | - |
| Water Soluble Nitrate (2:1) as N (leachate equivalent) | mg/l | 2 | NONE | - | - | - | - | - |
| Water Soluble Nitrate (2:1) as NO3 | mg/kg | 2 | NONE | - | - | - | - | - |
| Water Soluble Nitrate (2:1) as NO3 (leachate equivalent) | mg/l | 5 | NONE | - | - | - | - | - |

### Speciated PAHs

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Naphthalene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Acenaphthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Fluorene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Phenanthrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Anthracene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Fluoranthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Pyrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Chrysene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(b)fluoranthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(k)fluoranthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |

### Total PAH

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | MCERTS | - | - | - | - | - |

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**Analytical Report Number: 21-84269**
**Project / Site name: Space Project**
**Your Order No: 300621 02**

| **Lab Sample Number** | | | | 1922556 | 1922557 | 1922558 | 1922559 | 1922560 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP05 | WS04 | TP06 | TP07 | WS01 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.25 | 0.45 | 0.05 | 0.10 | 0.25 |
| **Date Sampled** | | | | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Barium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | - | - | - | - | - |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | - | - | - | - | - |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | - | - | - | - | - |
| Chromium (hexavalent) | mg/kg | 1.2 | MCERTS | - | - | - | - | - |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | - | - | - | - | - |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| | | | | | | | | |
| Magnesium (water soluble) | mg/kg | 5 | NONE | - | - | - | - | - |
| Magnesium (leachate equivalent) | mg/l | 2.5 | NONE | - | - | - | - | - |
| | | | | | | | | |
| **Petroleum Hydrocarbons** | | | | | | | | |
| Petroleum Range Organics (C6 - C10) | mg/kg | 0.1 | MCERTS | - | - | - | - | - |
| | | | | | | | | |
| TPH C10 - C40 | mg/kg | 10 | MCERTS | - | - | - | - | - |
| | | | | | | | | |
| TPH2 (C6 - C10) | mg/kg | 0.1 | MCERTS | - | - | - | - | - |
| | | | | | | | | |
| TPH C6 - C40 | mg/kg | 10 | NONE | - | - | - | - | - |
| | | | | | | | | |
| TPH (C10 - C25) | mg/kg | 10 | MCERTS | - | - | - | - | - |
| TPH (C25 - C40) | mg/kg | 10 | MCERTS | - | - | - | - | - |

U/S = Unsuitable Sample  I/S = Insufficient Sample

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**Analytical Report Number: 21-84269**
**Project / Site name: Space Project**
**Your Order No: 300621 02**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Lab Sample Number** | | | | 1922561 | 1922562 | 1922563 | 1922564 | 1922565 |
| **Sample Reference** | | | | TP09 | WS02 | TP10 | WS08 | WS09 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.10 | 0.50 | 0.25 | 0.30 | 0.20 |
| **Date Sampled** | | | | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| Stone Content | % | 0.1 | NONE | - | - | - | - | - |
| Moisture Content | % | 0.01 | NONE | - | - | - | - | - |
| Total mass of sample received | kg | 0.001 | NONE | - | - | - | - | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Asbestos in Soil Screen / Identification Name | Type | N/A | ISO 17025 | - | - | - | - | - |
| Asbestos in Soil | Type | N/A | ISO 17025 | Not-detected | Not-detected | Not-detected | Not-detected | Not-detected |
| Asbestos Quantification (Stage 2) | % | 0.001 | ISO 17025 | - | - | - | - | - |
| Asbestos Quantification Total | % | 0.001 | ISO 17025 | - | - | - | - | - |

**General Inorganics**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| pH - Automated | pH Units | N/A | MCERTS | - | - | - | - | - |
| Total Cyanide | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Free Cyanide | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Total Sulphate as SO4 | % | 0.005 | MCERTS | - | - | - | - | - |
| Water Soluble Sulphate as SO4 16hr extraction (2:1) | mg/kg | 2.5 | MCERTS | - | - | - | - | - |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | - | - | - | - | - |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | mg/l | 1.25 | MCERTS | - | - | - | - | - |
| Water Soluble Chloride (2:1) (leachate equivalent) | mg/l | 0.5 | MCERTS | - | - | - | - | - |
| Total Sulphur | % | 0.005 | MCERTS | - | - | - | - | - |
| Ammoniacal Nitrogen as NH4 | mg/kg | 0.5 | MCERTS | - | - | - | - | - |
| Ammonium as NH4 (10:1 leachate equivalent) | mg/l | 0.05 | MCERTS | - | - | - | - | - |
| Organic Matter | % | 0.1 | MCERTS | - | - | - | - | - |
| Total Organic Carbon (TOC) | % | 0.1 | MCERTS | - | - | - | - | - |
| Water Soluble Nitrate (2:1) as N (leachate equivalent) | mg/l | 2 | NONE | - | - | - | - | - |
| Water Soluble Nitrate (2:1) as NO3 | mg/kg | 2 | NONE | - | - | - | - | - |
| Water Soluble Nitrate (2:1) as NO3 (leachate equivalent) | mg/l | 5 | NONE | - | - | - | - | - |

**Speciated PAHs**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Naphthalene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Acenaphthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Fluorene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Phenanthrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Anthracene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Fluoranthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Pyrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Chrysene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(b)fluoranthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(k)fluoranthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |

**Total PAH**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | MCERTS | - | - | - | - | - |

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**Analytical Report Number: 21-84269**
**Project / Site name: Space Project**
**Your Order No: 300621 02**

| **Lab Sample Number** | | | | 1922561 | 1922562 | 1922563 | 1922564 | 1922565 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP09 | WS02 | TP10 | WS08 | WS09 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.10 | 0.50 | 0.25 | 0.30 | 0.20 |
| **Date Sampled** | | | | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Barium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | - | - | - | - | - |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | - | - | - | - | - |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | - | - | - | - | - |
| Chromium (hexavalent) | mg/kg | 1.2 | MCERTS | - | - | - | - | - |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | - | - | - | - | - |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Magnesium (water soluble) | mg/kg | 5 | NONE | - | - | - | - | - |
| Magnesium (leachate equivalent) | mg/l | 2.5 | NONE | - | - | - | - | - |
| **Petroleum Hydrocarbons** | | | | | | | | |
| Petroleum Range Organics (C6 - C10) | mg/kg | 0.1 | MCERTS | - | - | - | - | - |
| TPH C10 - C40 | mg/kg | 10 | MCERTS | - | - | - | - | - |
| TPH2 (C6 - C10) | mg/kg | 0.1 | MCERTS | - | - | - | - | - |
| TPH C6 - C40 | mg/kg | 10 | NONE | - | - | - | - | - |
| TPH (C10 - C25) | mg/kg | 10 | MCERTS | - | - | - | - | - |
| TPH (C25 - C40) | mg/kg | 10 | MCERTS | - | - | - | - | - |

U/S = Unsuitable Sample     I/S = Insufficient Sample

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The results included within the report relate only to the sample(s) submitted for testing.

**Analytical Report Number: 21-84269**
**Project / Site name: Space Project**
**Your Order No: 300621 02**

| **Lab Sample Number** | | | | 1922566 | 1922567 | 1922568 | 1922569 | 1922570 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | WS10 | WS11 | WS12 | TP01 | TP07 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.20 | 0.20 | 0.30 | 1.35 | 0.50 |
| **Date Sampled** | | | | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| Stone Content | % | 0.1 | NONE | - | - | - | < 0.1 | < 0.1 |
| Moisture Content | % | 0.01 | NONE | - | - | - | 21 | 6.5 |
| Total mass of sample received | kg | 0.001 | NONE | - | - | - | 1.0 | 0.80 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Asbestos in Soil Screen / Identification Name | Type | N/A | ISO 17025 | - | - | - | - | - |
| Asbestos in Soil | Type | N/A | ISO 17025 | Not-detected | Not-detected | Not-detected | - | - |
| Asbestos Quantification (Stage 2) | % | 0.001 | ISO 17025 | - | - | - | - | - |
| Asbestos Quantification Total | % | 0.001 | ISO 17025 | - | - | - | - | - |

**General Inorganics**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| pH - Automated | pH Units | N/A | MCERTS | - | - | - | 6.9 | 10.3 |
| Total Cyanide | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Free Cyanide | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Total Sulphate as SO4 | % | 0.005 | MCERTS | - | - | - | 0.525 | 0.317 |
| Water Soluble Sulphate as SO4 16hr extraction (2:1) | mg/kg | 2.5 | MCERTS | - | - | - | - | - |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | - | - | - | 1.3 | 0.67 |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | mg/l | 1.25 | MCERTS | - | - | - | 1340 | 666 |
| Water Soluble Chloride (2:1) (leachate equivalent) | mg/l | 0.5 | MCERTS | - | - | - | 12 | 17 |
| Total Sulphur | % | 0.005 | MCERTS | - | - | - | 0.242 | 0.273 |
| Ammoniacal Nitrogen as NH4 | mg/kg | 0.5 | MCERTS | - | - | - | < 0.5 | < 0.5 |
| Ammonium as NH4 (10:1 leachate equivalent) | mg/l | 0.05 | MCERTS | - | - | - | < 0.05 | < 0.05 |
| Organic Matter | % | 0.1 | MCERTS | - | - | - | - | - |
| Total Organic Carbon (TOC) | % | 0.1 | MCERTS | - | - | - | - | - |
| Water Soluble Nitrate (2:1) as N (leachate equivalent) | mg/l | 2 | NONE | - | - | - | 4.3 | < 2.0 |
| Water Soluble Nitrate (2:1) as NO3 | mg/kg | 2 | NONE | - | - | - | - | - |
| Water Soluble Nitrate (2:1) as NO3 (leachate equivalent) | mg/l | 5 | NONE | - | - | - | - | - |

**Speciated PAHs**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Naphthalene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Acenaphthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Fluorene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Phenanthrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Anthracene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Fluoranthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Pyrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Chrysene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(b)fluoranthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(k)fluoranthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |

**Total PAH**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | MCERTS | - | - | - | - | - |

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**Analytical Report Number: 21-84269**
**Project / Site name: Space Project**
**Your Order No: 300621 02**

| **Lab Sample Number** | | | | 1922566 | 1922567 | 1922568 | 1922569 | 1922570 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | WS10 | WS11 | WS12 | TP01 | TP07 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.20 | 0.20 | 0.30 | 1.35 | 0.50 |
| **Date Sampled** | | | | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 | 23/06/2021 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Barium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | - | - | - | - | - |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | - | - | - | - | - |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | - | - | - | - | - |
| Chromium (hexavalent) | mg/kg | 1.2 | MCERTS | - | - | - | - | - |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | - | - | - | - | - |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| | | | | | | | | |
| Magnesium (water soluble) | mg/kg | 5 | NONE | - | - | - | 43 | < 5.0 |
| Magnesium (leachate equivalent) | mg/l | 2.5 | NONE | - | - | - | 21 | < 2.5 |
| | | | | | | | | |
| **Petroleum Hydrocarbons** | | | | | | | | |
| Petroleum Range Organics (C6 - C10) | mg/kg | 0.1 | MCERTS | - | - | - | - | - |
| | | | | | | | | |
| TPH C10 - C40 | mg/kg | 10 | MCERTS | - | - | - | - | - |
| | | | | | | | | |
| TPH2 (C6 - C10) | mg/kg | 0.1 | MCERTS | - | - | - | - | - |
| | | | | | | | | |
| TPH C6 - C40 | mg/kg | 10 | NONE | - | - | - | - | - |
| | | | | | | | | |
| TPH (C10 - C25) | mg/kg | 10 | MCERTS | - | - | - | - | - |
| TPH (C25 - C40) | mg/kg | 10 | MCERTS | - | - | - | - | - |

U/S = Unsuitable Sample    I/S = Insufficient Sample

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The results included within the report relate only to the sample(s) submitted for testing.

**Analytical Report Number:** **21-84269**
**Project / Site name:** **Space Project**
**Your Order No:** **300621 02**

# Certificate of Analysis - Asbestos Quantification

## Methods:

### Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

### Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

| Sample Number | Sample ID | Sample Depth (m) | Sample Weight (g) | Asbestos Containing Material Types Detected (ACM) | PLM Results | Asbestos by hand picking/weighing (%) | Total % Asbestos in Sample |
|---|---|---|---|---|---|---|---|
| **1922549** | TP01 | 0.35 | 225 | Loose Fibrous Debris | **Chrysotile** | < 0.001 | **< 0.001** |

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number : 21-84269**
**Project / Site name: Space Project**

* 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 * |
|---|---|---|---|---|
| 1922541 | TP01 | None Supplied | 1.55 | Brown clay and loam. |
| 1922542 | WS06 | None Supplied | 1 | Brown loam and sand with coal. |
| 1922543 | TP03 | None Supplied | 1.3 | Brown clay. |
| 1922544 | TP06 | None Supplied | 0.7 | Brown clay. |
| 1922545 | TP07 | None Supplied | 1.1 | Brown clay. |
| 1922546 | TP09 | None Supplied | 0.55 | Brown loam and sand with gravel. |
| 1922547 | TP10 | None Supplied | 0.6 | Brown loam and sand with gravel and brick. |
| 1922548 | TP11 | None Supplied | 0.6 | Brown loam and clay with gravel. |
| 1922569 | TP01 | None Supplied | 1.35 | Brown loam and sand with gravel and vegetation. |
| 1922570 | TP07 | None Supplied | 0.5 | Brown clay and loam with gravel and brick. |

**Analytical Report Number : 21-84269**
**Project / Site name: Space Project**

**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 |
|---|---|---|---|---|---|
| Sulphate, water soluble, in soil (16hr extraction) | Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent). | In house method. | L038-PL | D | 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 |
| 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 |
| Hexavalent chromium in soil (Lower Level) | 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 |
| Free cyanide in soil | Determination of free cyanide 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 |
| Magnesium, water soluble, in soil | Determination of water soluble magnesium by extraction with water followed by ICP-OES. | In-house method based on TRL 447 | L038-PL | D | NONE |
| Moisture Content | Moisture content, determined gravimetrically. (30 oC) | In house method. | L019-UK/PL | W | NONE |
| Nitrate, water soluble, 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 |
| Organic matter (Automated) in soil | Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate. | In house method. | L009-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 |
| pH in soil (automated) | Determination of pH in soil by addition of water followed by automated electrometric measurement. | In house method. | L099-PL | D | MCERTS |
| PRO (Soil) | Determination of hydrocarbons C6-C10 by headspace GC-MS. | In-house method based on USEPA8260 | L088-PL | W | 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 |
| TPH2 (Soil) | Determination of hydrocarbons C6-C10 by headspace GC-MS. | In-house method based on USEPA8260 | L088-PL | W | MCERTS |
| Total cyanide in soil | Determination of total cyanide 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 |
| Total organic carbon (Automated) in soil | Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate. | In house method. | L009-PL | D | MCERTS |

**Analytical Report Number : 21-84269**
**Project / Site name: Space Project**

**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, 10:1 water extraction. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L082-PL | W | MCERTS |
| TPH Oils (Soils) | Determination of extractable hydrocarbons in soil by GC-MS/FID. | In-house method with silica gel split/clean up. | L076-PL | D | MCERTS |
| DRO (Soil) | Determination of extractable hydrocarbons in soil by GC-MS/FID. | In-house method with silica gel split/clean up. | L076-PL | D | MCERTS |
| TPH Banding in Soil by FID | Determination of hexane extractable hydrocarbons in soil by GC-FID. | In-house method, TPH with carbon banding and silica gel split/cleanup. | L076-PL | W | MCERTS |
| Asbestos Quantification - Gravimetric | Asbestos quantification by gravimetric method - in house method based on references. | HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft). | A006-PL | D | ISO 17025 |
| Total Sulphate in soil as % | Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES. | In house method. | L038-PL | D | MCERTS |
| Total Sulphur in soil as % | Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES. | In house method. | L038-PL | D | MCERTS |
| D.O. for Gravimetric Quant if Screen/ID positive | Dependent option for Gravimetric Quant if Screen/ID positive scheduled. | In house asbestos methods A001 & A006. | A006-PL | D | NONE |
| TPH C6 - C40 (soil) | Determination of TPH bands by HS-GC-MS/GC-FID | In-house method. | L076-PL | W | NONE |
| 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 | W | NONE |
| Chloride, water soluble, in soil | Determination of Chloride colorimetrically by discrete analyser. | In house method. | L082-PL | D | MCERTS |
| Water Soluble Nitrate (leachate equivalent) | 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 |
| 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. | L038-PL | D | MCERTS |

**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.**

**Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.**

# Sample Deviation Report

**Analytical Report Number : 21-84269**
**Project / Site name: Space Project**

| Sample ID | Other ID | Sample Type | Lab Sample Number | Sample Deviation | Test Name | Test Ref | Test Deviation |
|---|---|---|---|---|---|---|---|
| TP01 | None Supplied | S | 1922541 | c | Free cyanide in soil | L080-PL | c |
| TP01 | None Supplied | S | 1922541 | c | Total cyanide in soil | L080-PL | c |
| TP03 | None Supplied | S | 1922543 | c | Free cyanide in soil | L080-PL | c |
| TP03 | None Supplied | S | 1922543 | c | Total cyanide in soil | L080-PL | c |
| TP06 | None Supplied | S | 1922544 | c | Free cyanide in soil | L080-PL | c |
| TP06 | None Supplied | S | 1922544 | c | Total cyanide in soil | L080-PL | c |
| TP07 | None Supplied | S | 1922545 | c | Free cyanide in soil | L080-PL | c |
| TP07 | None Supplied | S | 1922545 | c | Total cyanide in soil | L080-PL | c |
| TP09 | None Supplied | S | 1922546 | c | Free cyanide in soil | L080-PL | c |
| TP09 | None Supplied | S | 1922546 | c | Total cyanide in soil | L080-PL | c |
| TP10 | None Supplied | S | 1922547 | c | Free cyanide in soil | L080-PL | c |
| TP10 | None Supplied | S | 1922547 | c | Total cyanide in soil | L080-PL | c |
| TP11 | None Supplied | S | 1922548 | c | Free cyanide in soil | L080-PL | c |
| TP11 | None Supplied | S | 1922548 | c | Total cyanide in soil | L080-PL | c |
| WS06 | None Supplied | S | 1922542 | c | Free cyanide in soil | L080-PL | c |
| WS06 | None Supplied | S | 1922542 | c | Total cyanide in soil | L080-PL | c |

Key: **a** - No sampling date **b** - Incorrect container
**c** - Holding time **d** - Headspace **e** - Temperature

**Liam McMahon**
IGE Consulting
14-32 Hewitt Street
Manchester
M15 4GB

**e:** liammcmahon@igeconsulting.co.uk

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Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

**t:** 01923 225404
**f:** 01923 237404
**e:** reception@i2analytical.com

# Analytical Report Number : 21-84274

| | | | |
|---|---|---|---|
| **Project / Site name:** | Space Project | **Samples received on:** | 29/06/2021 |
| **Your job number:** | 3534 | **Samples instructed on/ Analysis started on:** | 30/06/2021 |
| **Your order number:** | 300621 02 | **Analysis completed by:** | 07/07/2021 |
| **Report Issue Number:** | 1 | **Report issued on:** | 07/07/2021 |
| **Samples Analysed:** | 3 wac multi samples | | |

**Signed:** Izabela Wójcik

Izabela Wójcik
Technical Reviewer (Reporting Team)
**For & on behalf of i2 Analytical Ltd.**

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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 |

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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## Waste Acceptance Criteria Analytical Results

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Report No:** | **21-84274** | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | **Client: IGECONS** | | |
| | | | | | | | |
| **Location** | **Space Project** | | | | | | |
| **Lab Reference (Sample Number)** | 1922583 | | | | **Landfill Waste Acceptance Criteria** | | |
| | | | | | **Limits** | | |
| **Sampling Date** | 23/06/2021 | | | | Inert Waste Landfill | Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill | Hazardous Waste Landfill |
| **Sample ID** | TP04 | | | | | | |
| **Depth (m)** | 1.00 | | | | | | |
| **Solid Waste Analysis** | | | | | | | |
| TOC (%)** | 1.3 | | | | 3% | 5% | 6% |
| Loss on Ignition (%) ** | 3.2 | | | | -- | -- | 10% |
| BTEX (µg/kg) ** | < 10 | | | | 6000 | -- | -- |
| Sum of PCBs (mg/kg) ** | < 0.30 | | | | 1 | -- | -- |
| Mineral Oil (mg/kg) # | < 10 | | | | 500 | -- | -- |
| Total PAH (WAC-17) (mg/kg) | < 0.85 | | | | 100 | -- | -- |
| pH (units)** | 7.1 | | | | -- | >6 | -- |
| Acid Neutralisation Capacity (mol / kg) | 0.59 | | | | -- | To be evaluated | To be evaluated |
| **Eluate Analysis** | 2:1 | 8:1 | | Cumulative 10:1 | Limit values for compliance leaching test | | |
| (BS EN 12457 - 3 preparation utilising end over end leaching procedure) | mg/l | mg/l | | mg/kg | using BS EN 12457-3 at L/S 10 l/kg (mg/kg) | | |
| Arsenic * | < 0.010 | < 0.010 | | < 0.050 | 0.5 | 2 | 25 |
| Barium * | 0.081 | 0.077 | | 0.77 | 20 | 100 | 300 |
| Cadmium * | < 0.0005 | < 0.0005 | | < 0.0020 | 0.04 | 1 | 5 |
| Chromium * | < 0.0010 | < 0.0010 | | 0.0083 | 0.5 | 10 | 70 |
| Copper * | 0.0057 | 0.0050 | | 0.051 | 2 | 50 | 100 |
| Mercury * | < 0.0015 | < 0.0015 | | < 0.010 | 0.01 | 0.2 | 2 |
| Molybdenum * | 0.0052 | 0.0038 | | 0.039 | 0.5 | 10 | 30 |
| Nickel * | 0.014 | 0.0060 | | 0.066 | 0.4 | 10 | 40 |
| Lead * | < 0.0050 | < 0.0050 | | 0.037 | 0.5 | 10 | 50 |
| Antimony * | < 0.0050 | < 0.0050 | | < 0.020 | 0.06 | 0.7 | 5 |
| Selenium * | 0.014 | < 0.010 | | 0.096 | 0.1 | 0.5 | 7 |
| Zinc * | 0.014 | 0.0131 | | 0.13 | 4 | 50 | 200 |
| Chloride * | 24 | < 4.0 | | 44 | 800 | 15000 | 25000 |
| Fluoride | 0.18 | 0.19 | | 1.9 | 10 | 150 | 500 |
| Sulphate * | 1700 | 370 | | 4800 | 1000 | 20000 | 50000 |
| TDS* | 1300 | 440 | | 5100 | 4000 | 60000 | 100000 |
| Phenol Index (Monohydric Phenols) * | < 0.13 | < 0.13 | | < 0.50 | 1 | - | - |
| DOC | 20 | 7.4 | | 84 | 500 | 800 | 1000 |
| | | | | | | | |
| | | | | | | | |
| **Leach Test Information** | | | | | | | |
| | | | | | | | |
| Stone Content (%) | < 0.1 | | | | | | |
| Sample Mass (kg) | 1.3 | | | | | | |
| Dry Matter (%) | 82 | | | | | | |
| Moisture (%) | 18 | | | | | | |
| **Stage 1** | | | | | | | |
| Volume Eluate L2 (litres) | 0.30 | | | | | | |
| Filtered Eluate VE1 (litres) | 0.14 | | | | | | |
| | | | | | | | |
| | | | | | | | |

Results are expressed on a dry weight basis, after correction for moisture content where applicable.

*= UKAS accredited (liquid eluate analysis only)

Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation

** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

**i2 Analytical**
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email:reception@i2analytical.com

## Waste Acceptance Criteria Analytical Results

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Report No:** | **21-84274** | | | | | | |
| | | | | | **Client: IGECONS** | | |
| **Location** | **Space Project** | | | | | | |
| **Lab Reference (Sample Number)** | 1922584 | | | | **Landfill Waste Acceptance Criteria** | | |
| | | | | | **Limits** | | |
| **Sampling Date** | 23/06/2021 | | | | Inert Waste Landfill | Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill | Hazardous Waste Landfill |
| **Sample ID** | TP06 | | | | | | |
| **Depth (m)** | 0.30 | | | | | | |
| **Solid Waste Analysis** | | | | | | | |
| TOC (%)** | 0.7 | | | | 3% | 5% | 6% |
| Loss on Ignition (%) ** | 3.1 | | | | -- | -- | 10% |
| BTEX (µg/kg) ** | < 10 | | | | 6000 | -- | -- |
| Sum of PCBs (mg/kg) ** | < 0.30 | | | | 1 | -- | -- |
| Mineral Oil (mg/kg) # | 190 | | | | 500 | -- | -- |
| Total PAH (WAC-17) (mg/kg) | 11.4 | | | | 100 | -- | -- |
| pH (units)** | 11.4 | | | | -- | >6 | -- |
| Acid Neutralisation Capacity (mol / kg) | 29 | | | | -- | To be evaluated | To be evaluated |
| **Eluate Analysis** | 2:1 | 8:1 | | Cumulative 10:1 | Limit values for compliance leaching test | | |
| (BS EN 12457 - 3 preparation utilising end over end leaching procedure) | mg/l | mg/l | | mg/kg | using BS EN 12457-3 at L/S 10 l/kg (mg/kg) | | |
| Arsenic * | < 0.010 | < 0.010 | | < 0.050 | 0.5 | 2 | 25 |
| Barium * | 0.21 | 0.086 | | 1.0 | 20 | 100 | 300 |
| Cadmium * | < 0.0005 | < 0.0005 | | < 0.0020 | 0.04 | 1 | 5 |
| Chromium * | 0.068 | 0.015 | | 0.21 | 0.5 | 10 | 70 |
| Copper * | 0.062 | 0.018 | | 0.23 | 2 | 50 | 100 |
| Mercury * | < 0.0015 | < 0.0015 | | < 0.010 | 0.01 | 0.2 | 2 |
| Molybdenum * | 0.014 | 0.0033 | | 0.045 | 0.5 | 10 | 30 |
| Nickel * | 0.0091 | 0.0039 | | 0.045 | 0.4 | 10 | 40 |
| Lead * | < 0.0050 | < 0.0050 | | 0.027 | 0.5 | 10 | 50 |
| Antimony * | < 0.0050 | < 0.0050 | | < 0.020 | 0.06 | 0.7 | 5 |
| Selenium * | < 0.010 | < 0.010 | | 0.092 | 0.1 | 0.5 | 7 |
| Zinc * | 0.0059 | 0.0047 | | 0.048 | 4 | 50 | 200 |
| Chloride * | 10 | < 4.0 | | 32 | 800 | 15000 | 25000 |
| Fluoride | 0.28 | 0.23 | | 2.4 | 10 | 150 | 500 |
| Sulphate * | 360 | 120 | | 1500 | 1000 | 20000 | 50000 |
| TDS* | 800 | 430 | | 4700 | 4000 | 60000 | 100000 |
| Phenol Index (Monohydric Phenols) * | < 0.13 | < 0.13 | | < 0.50 | 1 | - | - |
| DOC | 9.9 | 6.2 | | 66 | 500 | 800 | 1000 |
| **Leach Test Information** | | | | | | | |
| Stone Content (%) | < 0.1 | | | | | | |
| Sample Mass (kg) | 1.3 | | | | | | |
| Dry Matter (%) | 94 | | | | | | |
| Moisture (%) | 5.7 | | | | | | |
| **Stage 1** | | | | | | | |
| Volume Eluate L2 (litres) | 0.33 | | | | | | |
| Filtered Eluate VE1 (litres) | 0.20 | | | | | | |
| Results are expressed on a dry weight basis, after correction for moisture content where applicable. | | | | | *= UKAS accredited (liquid eluate analysis only) | | |
| Stated limits are for guidance only and i2 cannot be held responsible for any discrepencies with current legislation | | | | | ** = MCERTS accredited | | |

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

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## Waste Acceptance Criteria Analytical Results

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Report No:** | **21-84274** | | | | | | |
| | | | | | **Client:** | **IGECONS** | |
| **Location** | **Space Project** | | | | | | |
| **Lab Reference (Sample Number)** | 1922585 | | | | **Landfill Waste Acceptance Criteria Limits** | | |
| **Sampling Date** | 23/06/2021 | | | | Inert Waste Landfill | Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill | Hazardous Waste Landfill |
| **Sample ID** | WS02 | | | | | | |
| **Depth (m)** | 0.75 | | | | | | |
| **Solid Waste Analysis** | | | | | | | |
| TOC (%)** | 1.1 | | | | 3% | 5% | 6% |
| Loss on Ignition (%) ** | 3.9 | | | | -- | -- | 10% |
| BTEX (µg/kg) ** | < 10 | | | | 6000 | -- | -- |
| Sum of PCBs (mg/kg) ** | < 0.30 | | | | 1 | -- | -- |
| Mineral Oil (mg/kg) # | 55 | | | | 500 | -- | -- |
| Total PAH (WAC-17) (mg/kg) | 74.9 | | | | 100 | -- | -- |
| pH (units)** | 8.2 | | | | -- | >6 | -- |
| Acid Neutralisation Capacity (mol / kg) | 3.2 | | | | -- | To be evaluated | To be evaluated |
| **Eluate Analysis** | 2:1 | 8:1 | | Cumulative 10:1 | Limit values for compliance leaching test | | |
| (BS EN 12457 - 3 preparation utilising end over end leaching procedure) | mg/l | mg/l | | mg/kg | using BS EN 12457-3 at L/S 10 l/kg (mg/kg) | | |
| Arsenic * | 0.012 | < 0.010 | | 0.098 | 0.5 | 2 | 25 |
| Barium * | 0.033 | 0.022 | | 0.24 | 20 | 100 | 300 |
| Cadmium * | < 0.0005 | < 0.0005 | | < 0.0020 | 0.04 | 1 | 5 |
| Chromium * | 0.0045 | 0.0031 | | 0.033 | 0.5 | 10 | 70 |
| Copper * | 0.019 | 0.016 | | 0.17 | 2 | 50 | 100 |
| Mercury * | < 0.0015 | < 0.0015 | | < 0.010 | 0.01 | 0.2 | 2 |
| Molybdenum * | 0.028 | 0.0050 | | 0.077 | 0.5 | 10 | 30 |
| Nickel * | 0.0037 | 0.0045 | | 0.044 | 0.4 | 10 | 40 |
| Lead * | < 0.0050 | < 0.0050 | | 0.043 | 0.5 | 10 | 50 |
| Antimony * | < 0.0050 | < 0.0050 | | < 0.020 | 0.06 | 0.7 | 5 |
| Selenium * | < 0.010 | < 0.010 | | < 0.040 | 0.1 | 0.5 | 7 |
| Zinc * | 0.0050 | 0.0045 | | 0.045 | 4 | 50 | 200 |
| Chloride * | 11 | < 4.0 | | 32 | 800 | 15000 | 25000 |
| Fluoride | 1.7 | 0.71 | | 8.2 | 10 | 150 | 500 |
| Sulphate * | 140 | 32 | | 450 | 1000 | 20000 | 50000 |
| TDS* | 240 | 92 | | 1100 | 4000 | 60000 | 100000 |
| Phenol Index (Monohydric Phenols) * | < 0.13 | < 0.13 | | < 0.50 | 1 | - | - |
| DOC | 39 | 18 | | 200 | 500 | 800 | 1000 |
| **Leach Test Information** | | | | | | | |
| Stone Content (%) | < 0.1 | | | | | | |
| Sample Mass (kg) | 0.50 | | | | | | |
| Dry Matter (%) | 85 | | | | | | |
| Moisture (%) | 15 | | | | | | |
| **Stage 1** | | | | | | | |
| Volume Eluate L2 (litres) | 0.31 | | | | | | |
| Filtered Eluate VE1 (litres) | 0.20 | | | | | | |

Results are expressed on a dry weight basis, after correction for moisture content where applicable. *= UKAS accredited (liquid eluate analysis only)

Stated limits are for guidance only and i2 cannot be held responsible for any discrepencies with current legislation ** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

**Analytical Report Number : 21-84274**
**Project / Site name: Space Project**

* 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 * |
|---|---|---|---|---|
| 1922583 | TP04 | None Supplied | 1 | Brown loam and sand with gravel. |
| 1922584 | TP06 | None Supplied | 0.3 | Brown loam and sand with gravel and coal. |
| 1922585 | WS02 | None Supplied | 0.75 | Brown clay and loam with gravel. |

**Analytical Report Number : 21-84274**
**Project / Site name: Space Project**

**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 |
|---|---|---|---|---|---|
| Moisture Content | Moisture content, determined gravimetrically. (30 oC) | In house method. | L019-UK/PL | W | NONE |
| 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 |
| Preparation WAC leachate | | In-house method | L043-PL | W | NONE |
| Speciated WAC-17 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. MCERTS accredited except Coronene. | L064-PL | D | MCERTS |
| Chloride in WAC leachate (BS EN 12457-3 Prep) | Determination of Chloride colorimetrically by discrete analyser. | In house based on MEWAM Method ISBN 0117516260. | L082-PL | W | ISO 17025 |
| Fluoride in WAC leachate (BS EN 12457-3 Prep) | Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode. | In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed. | L033-PL | W | ISO 17025 |
| Phenol Index in WAC leachate (BS EN 12457-3 Prep) | Determination of monohydric phenols in leachate by continuous flow analyser. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar) | L080-PL | W | ISO 17025 |
| Sulphate in WAC leachate (BS EN 12457-3 Prep) | Determination of sulphate in leachate by acidification followed by ICP-OES. | In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed. | L039-PL | W | ISO 17025 |
| TDS in WAC leachate (BS EN 12457-3 Prep) | Determination of total dissolved solids in leachate by electrometric measurement. | In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed. | L031-PL | W | NONE |
| DOC in WAC leachate (BS EN 12457-3 Prep) | Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser. | In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed. | L037-PL | W | NONE |
| Acid neutralisation capacity of soil | Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe. | In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance | L046-PL | W | NONE |
| Loss on ignition of soil @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace. | In house method. | L047-PL | D | MCERTS |
| Mineral Oil in Soil C10 - C40 | Determination of dichloromethane/hexane extractable hydrocarbons in soil by GC-MS. | In-house method based on USEPA 8270 | L076-PL | D | NONE |
| pH in soil | Determination of pH in soil by addition of water followed by electrometric measurement. | In house method. | L005-PL | W | 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. | L023-PL | D | MCERTS |
| Metals in WAC leachate (BS EN 12457-3 Prep) | Determination of metals in leachate by acidification followed by ICP-OES. | In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed. | L039-PL | W | ISO 17025 |
| PCB's by GC-MS in soil | Determination of PCB by extraction with acetone and hexane followed by GC-MS. | In-house method based on USEPA 8082 | L027-PL | D | MCERTS |

**Analytical Report Number : 21-84274**
**Project / Site name: Space Project**

**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 |
|---|---|---|---|---|---|
| BTEX (Sum of BTEX compounds) in soil | Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited | In-house method based on USEPA8260 | L073B-PL | W | MCERTS |

**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.**

**Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.**

# APPENDIX 10

# GEOTECHNICAL LABORATORY TESTING

# TEST CERTIFICATE

## Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: IGE Consulting
Client Address: 14-32 Hewitt Street, Manchester,
M15 4GB
Contact: Liam McMahon
Site Address: Space Project

Client Reference: 3534
Job Number: 21-84894
Date Sampled: Not Given
Date Received: 02/07/2021
Date Tested: 08/07/2021
Sampled By: Client

*Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland*

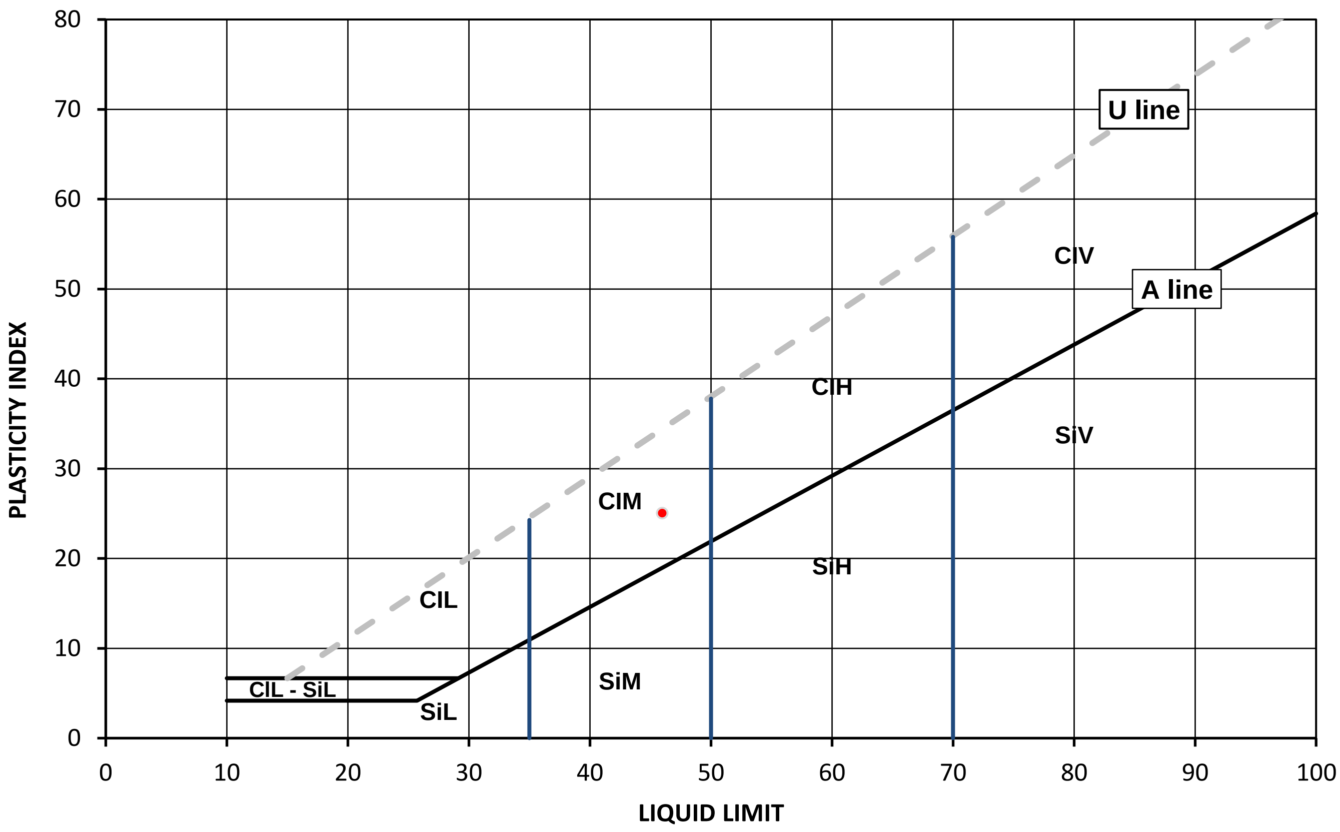
**Test Results:**

Laboratory Reference: 1926266
Hole No.: TP03
Sample Reference: Not Given
Soil Description: Mottled brown slightly gravelly slightly sandy CLAY

Depth Top [m]: 1.20
Depth Base [m]: Not Given
Sample Type: B

Sample Preparation: Tested after washing to remove >425um

| As Received Moisture Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 19 | 46 | 21 | 25 | 97 |



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| Cl | Clay | L | Low | below 35 |
| Si | Silt | M | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | exceeding 70 |
| | | O | Organic | append to classification for organic material ( eg ClHO ) |

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

**Signed:**

Szczepan Bielatowicz
PL Deputy Head of Geotechnical Section
**for and on behalf of i2 Analytical Ltd**

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

**Date Reported:** 23/07/2021

4041

# TEST CERTIFICATE

## Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: IGE Consulting
Client Address: 14-32 Hewitt Street, Manchester, M15 4GB
Contact: Liam McMahon
Site Address: Space Project

Client Reference: 3534
Job Number: 21-84894
Date Sampled: Not Given
Date Received: 02/07/2021
Date Tested: 09/07/2021
Sampled By: Client

*Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland*

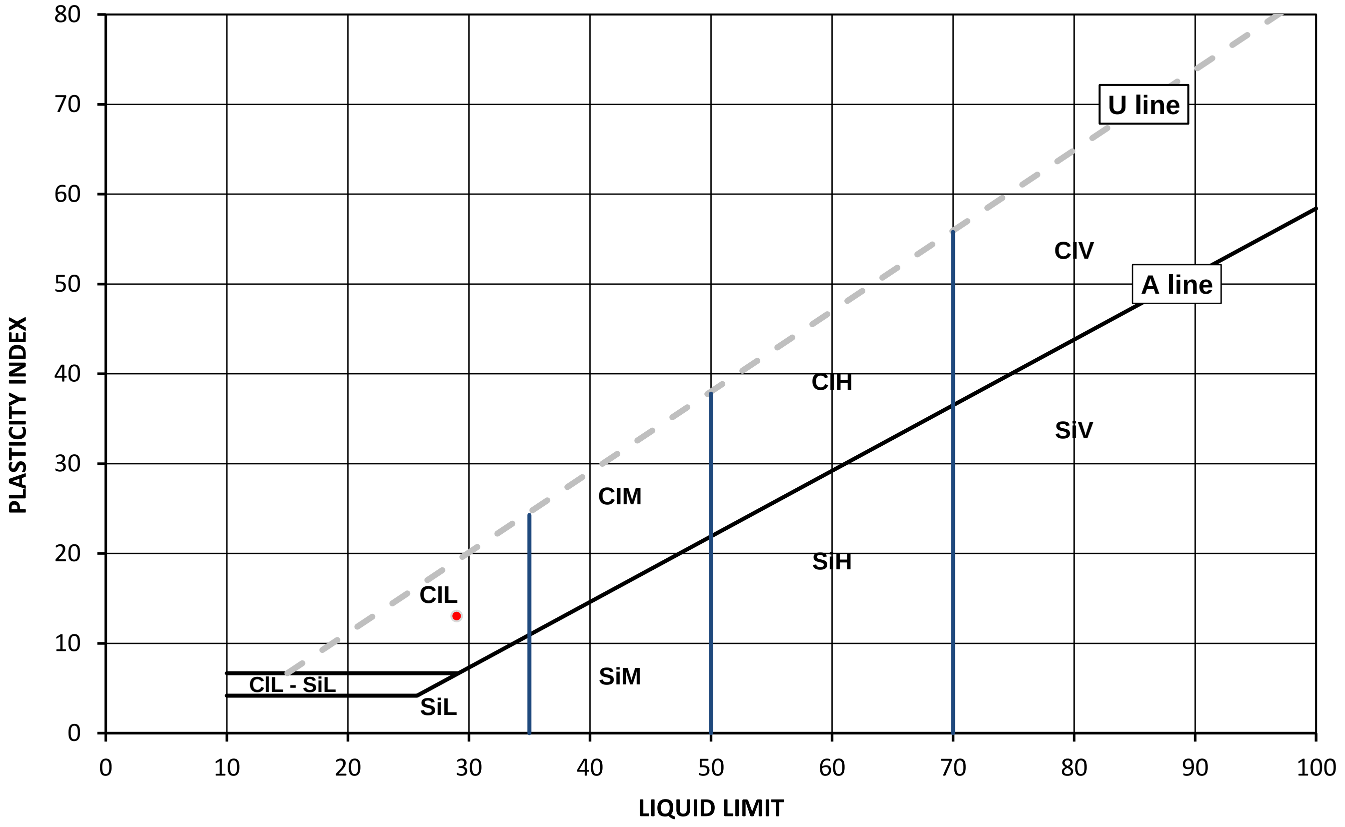
**Test Results:**

Laboratory Reference: 1926267
Hole No.: BH03
Sample Reference: Not Given
Soil Description: Greyish brown slightly gravelly very sandy CLAY

Depth Top [m]: 2.00
Depth Base [m]: 2.45
Sample Type: U

Sample Preparation: Tested after washing to remove >425um

| As Received Moisture Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 15 | 29 | 16 | 13 | 89 |



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| Cl | Clay | L | Low | below 35 |
| Si | Silt | M | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | exceeding 70 |
| | | O | Organic | append to classification for organic material ( eg ClHO ) |

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

**Signed:**

Szczepan Bielatowicz
PL Deputy Head of Geotechnical Section
**for and on behalf of i2 Analytical Ltd**

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**Date Reported:** 23/07/2021

4041

# TEST CERTIFICATE

## Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

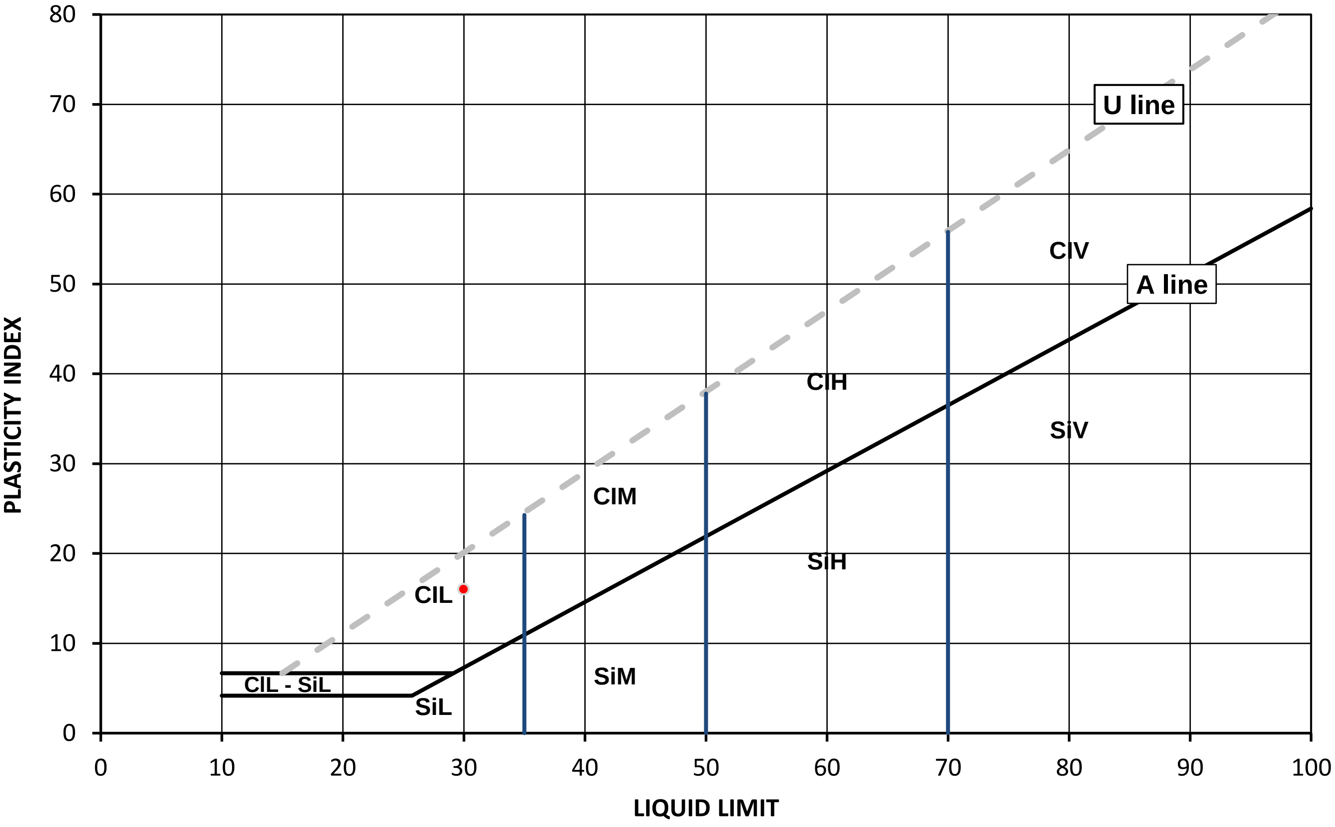
|  |  |  |  |
|---|---|---|---|
| Client: | IGE Consulting | Client Reference: | 3534 |
| Client Address: | 14-32 Hewitt Street, Manchester,<br>M15 4GB | Job Number: | 21-84894 |
|  |  | Date Sampled: | Not Given |
|  |  | Date Received: | 02/07/2021 |
| Contact: | Liam McMahon | Date Tested: | 08/07/2021 |
| Site Address: | Space Project | Sampled By: | Client |

*Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland*

**Test Results:**

|  |  |  |  |
|---|---|---|---|
| Laboratory Reference: | 1926268 | Depth Top [m]: | 5.00 |
| Hole No.: | BH03 | Depth Base [m]: | 5.45 |
| Sample Reference: | Not Given | Sample Type: | D |
| Soil Description: | Brown slightly gravelly very sandy CLAY |  |  |
| Sample Preparation: | Tested after washing to remove >425um |  |  |

| As Received Moisture Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 9.7 | 30 | 14 | 16 | 82 |



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

|  |  |  | Plasticity | Liquid Limit |
|---|---|---|---|---|
| Cl | Clay | L | Low | below 35 |
| Si | Silt | M | Medium | 35 to 50 |
|  |  | H | High | 50 to 70 |
|  |  | V | Very high | exceeding 70 |
|  |  | O | Organic | append to classification for organic material ( eg ClHO ) |

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

**Signed:**

Szczepan Bielatowicz
PL Deputy Head of Geotechnical Section
**for and on behalf of i2 Analytical Ltd**

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**Date Reported:** 23/07/2021

UKAS TESTING
4041

# TEST CERTIFICATE

## Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Analytical i2
Environmental Science

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: IGE Consulting
Client Address: 14-32 Hewitt Street, Manchester, M15 4GB
Contact: Liam McMahon
Site Address: Space Project

Client Reference: 3534
Job Number: 21-84894
Date Sampled: Not Given
Date Received: 02/07/2021
Date Tested: 09/07/2021
Sampled By: Client

*Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland*

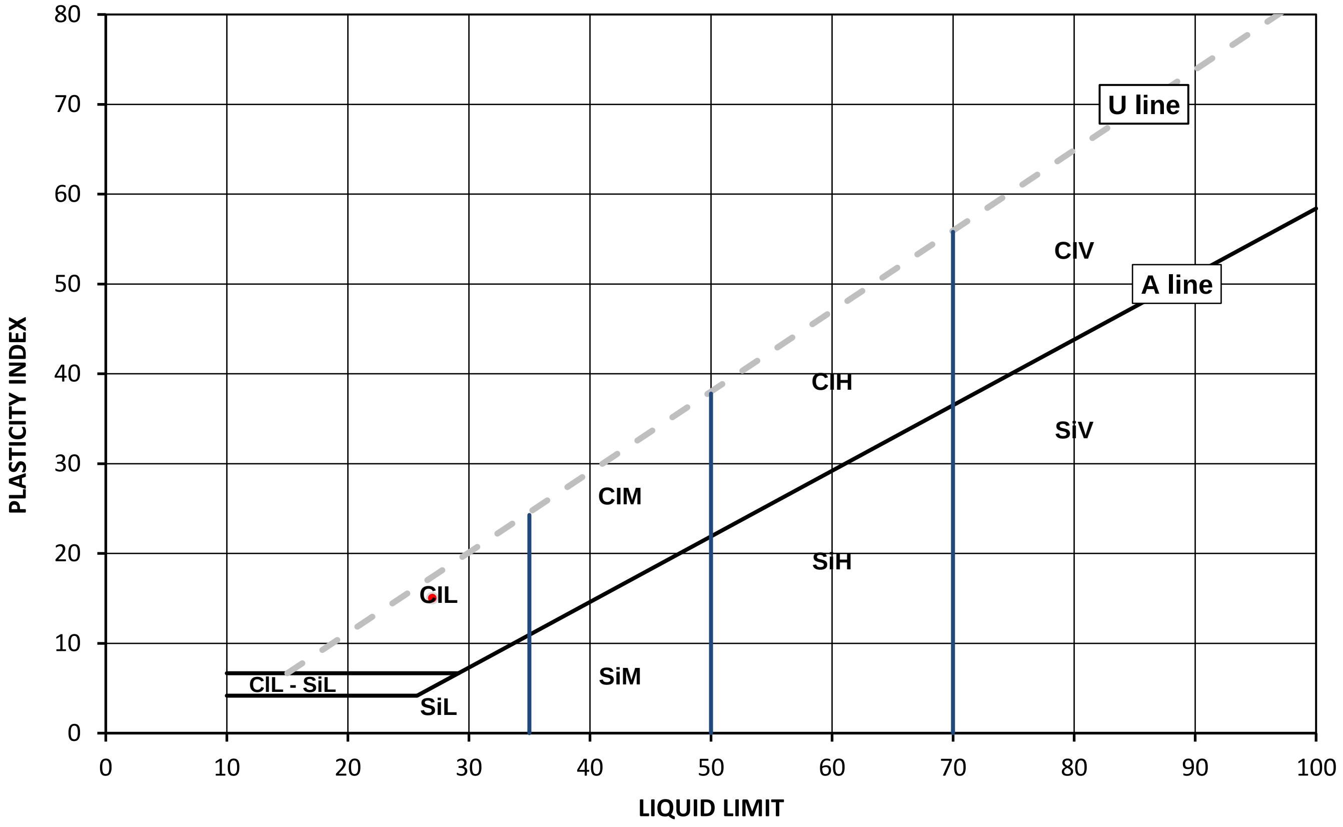
**Test Results:**

Laboratory Reference: 1926271
Hole No.: BH02
Sample Reference: Not Given
Soil Description: Greyish brown slightly gravelly very sandy CLAY

Depth Top [m]: 3.00
Depth Base [m]: 3.45
Sample Type: U

Sample Preparation: Tested after washing to remove >425um

| As Received Moisture Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 11 | 27 | 12 | 15 | 83 |



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

| | | | | Plasticity | Liquid Limit |
|---|---|---|---|---|---|
| Cl | Clay | L | Low | | below 35 |
| Si | Silt | M | Medium | | 35 to 50 |
| | | H | High | | 50 to 70 |
| | | V | Very high | | exceeding 70 |
| | | O | Organic | | append to classification for organic material ( eg ClHO ) |

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

**Signed:**

Szczepan Bielatowicz
PL Deputy Head of Geotechnical Section
**for and on behalf of i2 Analytical Ltd**

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**Date Reported:** 23/07/2021

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# TEST CERTIFICATE

## Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: IGE Consulting
Client Address: 14-32 Hewitt Street, Manchester,
M15 4GB
Contact: Liam McMahon
Site Address: Space Project

Client Reference: 3534
Job Number: 21-84894
Date Sampled: Not Given
Date Received: 02/07/2021
Date Tested: 08/07/2021
Sampled By: Client

*Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland*

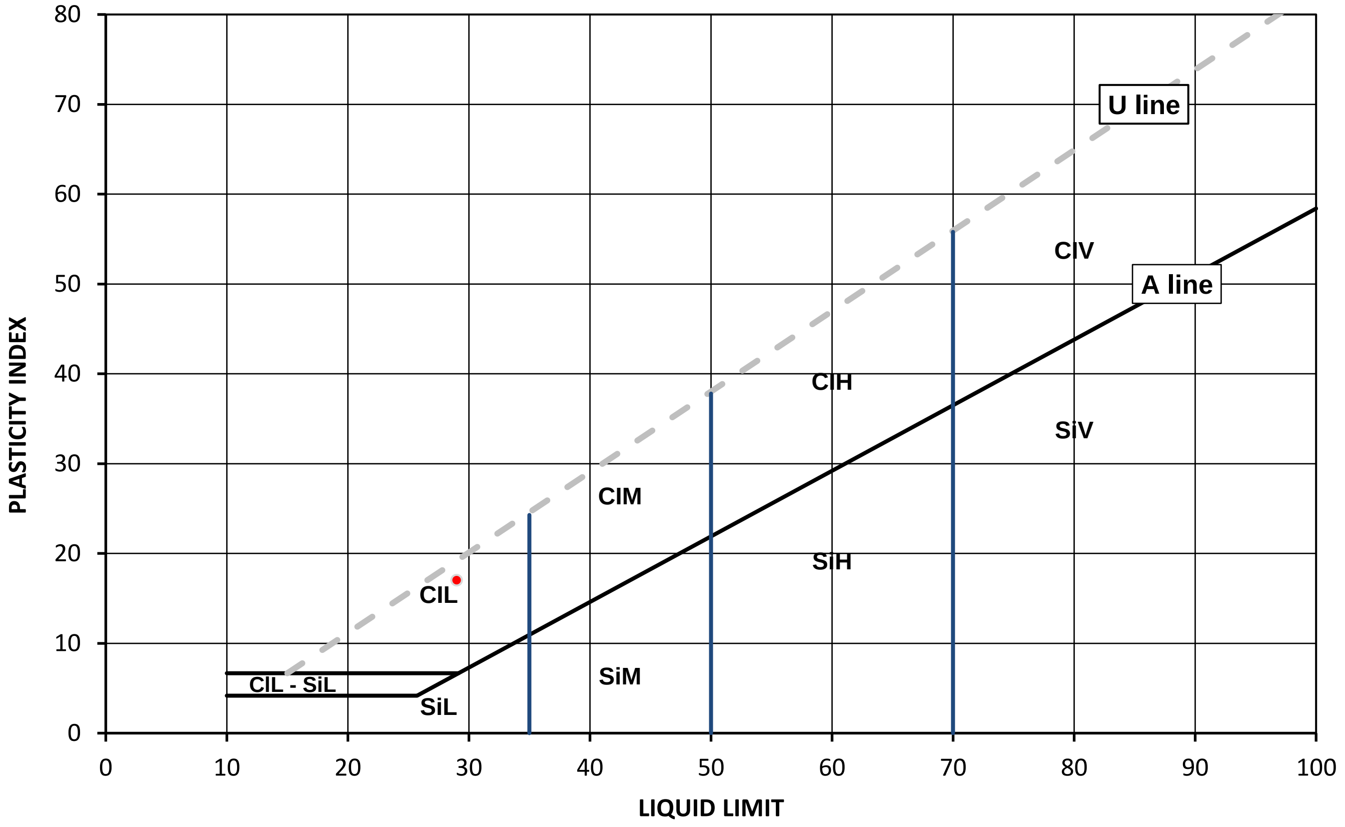
**Test Results:**

Laboratory Reference: 1926272
Hole No.: BH02
Sample Reference: Not Given
Soil Description: Brown slightly gravelly very sandy CLAY

Depth Top [m]: 4.00
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

| As Received Moisture Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 8.5 | 29 | 12 | 17 | 78 |



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

| | | | Plasticity | | Liquid Limit |
|---|---|---|---|---|---|
| Cl | Clay | L | Low | | below 35 |
| Si | Silt | M | Medium | | 35 to 50 |
| | | H | High | | 50 to 70 |
| | | V | Very high | | exceeding 70 |
| | | O | Organic | | append to classification for organic material ( eg ClHO ) |

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

**Signed:**

Szczepan Bielatowicz
PL Deputy Head of Geotechnical Section
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**Date Reported:** 23/07/2021

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# TEST CERTIFICATE

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

## Liquid and Plastic Limits

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: IGE Consulting
Client Address: 14-32 Hewitt Street, Manchester,
M15 4GB
Contact: Liam McMahon
Site Address: Space Project

Client Reference: 3534
Job Number: 21-84894
Date Sampled: Not Given
Date Received: 02/07/2021
Date Tested: 08/07/2021
Sampled By: Client

*Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland*

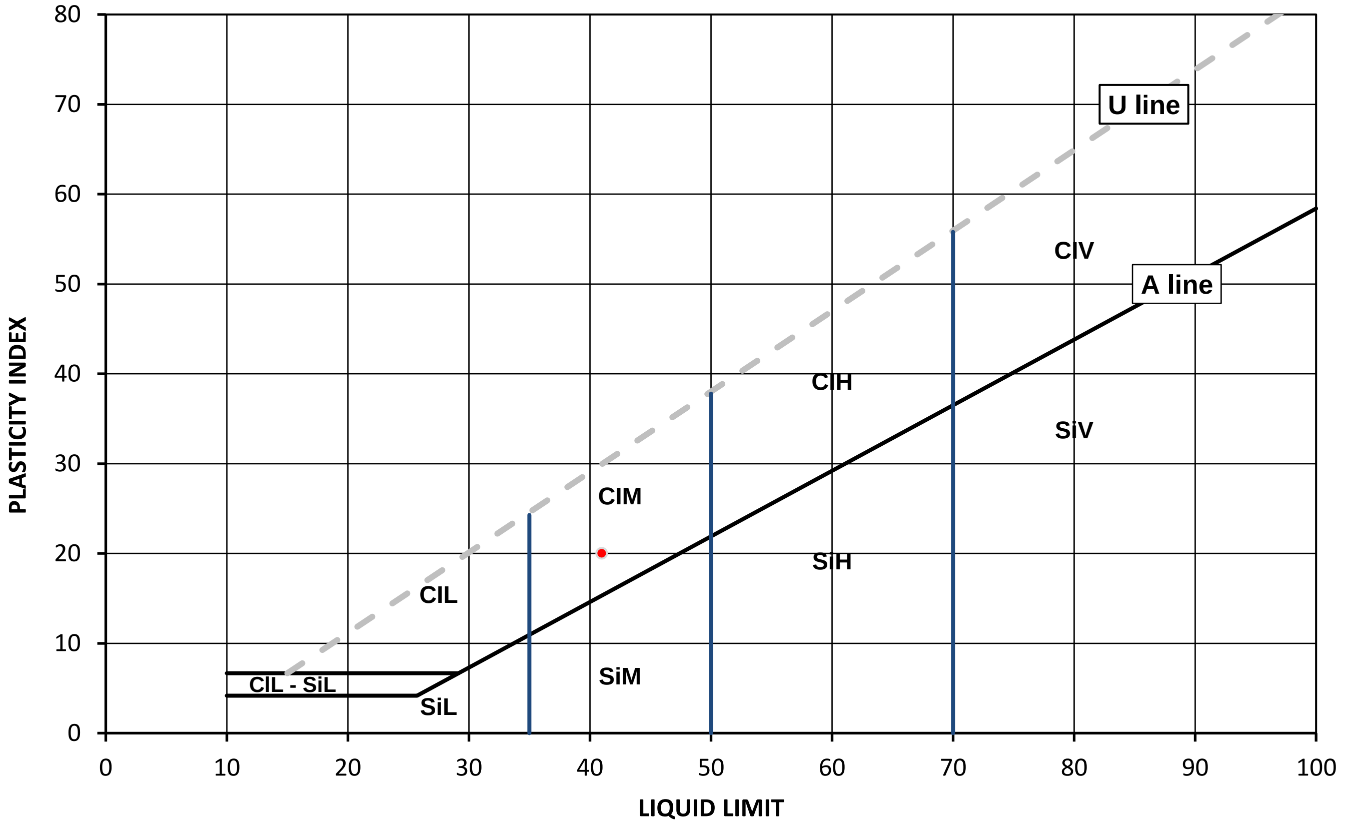
### Test Results:

Laboratory Reference: 1926273
Hole No.: TP09
Sample Reference: Not Given
Soil Description: Brown sandy CLAY

Depth Top [m]: 0.90
Depth Base [m]: Not Given
Sample Type: B

Sample Preparation: Tested in natural condition

| As Received Moisture Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 23 | 41 | 21 | 20 | 100 |



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

| | | Plasticity | | Liquid Limit |
|---|---|---|---|---|
| Cl | Clay | L | Low | below 35 |
| Si | Silt | M | Medium | 35 to 50 |
| | | H | High | 50 to 70 |
| | | V | Very high | exceeding 70 |
| | | O | Organic | append to classification for organic material ( eg ClHO ) |

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

**Signed:**

Szczepan Bielatowicz
PL Deputy Head of Geotechnical Section
**for and on behalf of i2 Analytical Ltd**

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**Date Reported:** 23/07/2021

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# TEST CERTIFICATE

## Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

|  |  |  |  |
|---|---|---|---|
| Client: | IGE Consulting | Client Reference: | 3534 |
| Client Address: | 14-32 Hewitt Street, Manchester,<br>M15 4GB | Job Number: | 21-84894 |
|  |  | Date Sampled: | Not Given |
|  |  | Date Received: | 02/07/2021 |
| Contact: | Liam McMahon | Date Tested: | 09/07/2021 |
| Site Address: | Space Project | Sampled By: | Client |

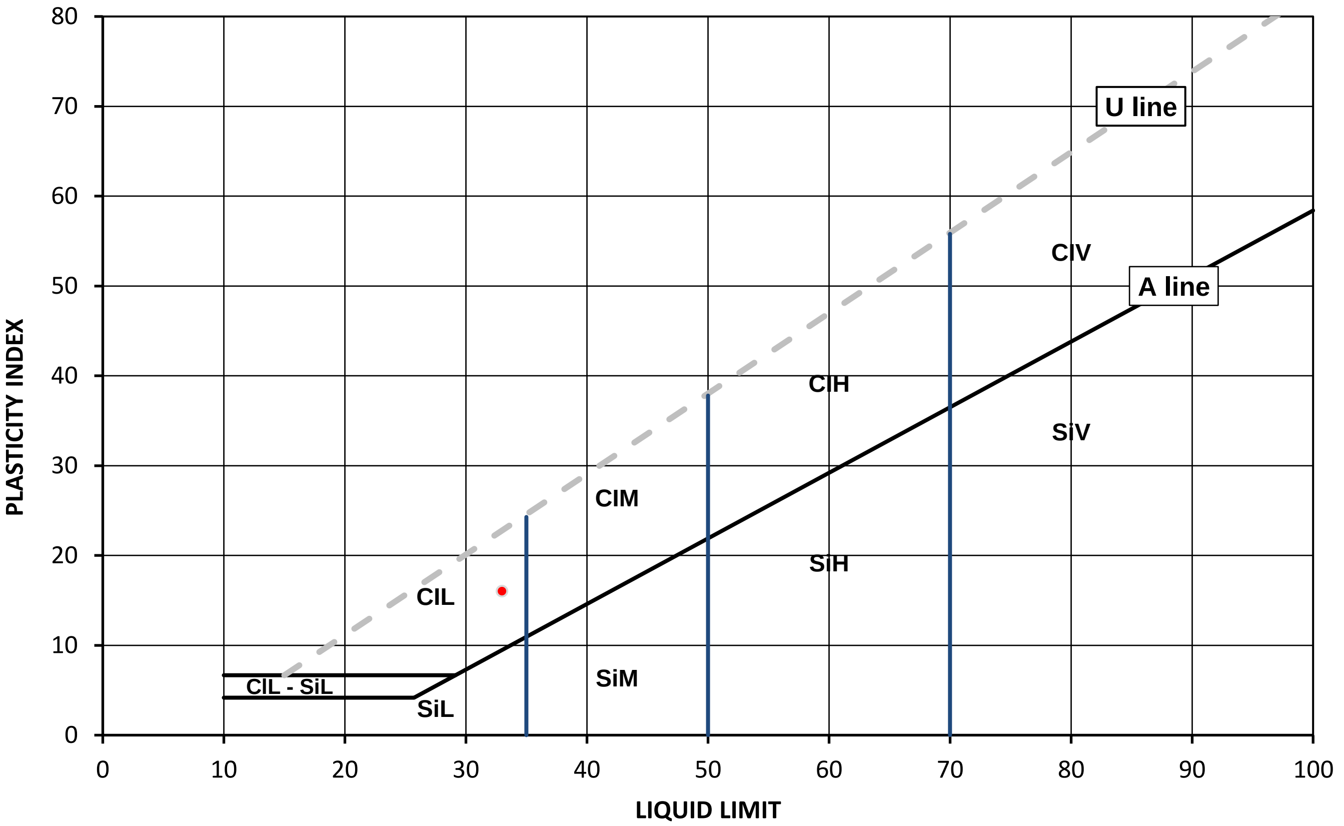
*Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland*

**Test Results:**

|  |  |  |  |
|---|---|---|---|
| Laboratory Reference: | 1926274 | Depth Top [m]: | 2.00 |
| Hole No.: | BH01 | Depth Base [m]: | 2.45 |
| Sample Reference: | Not Given | Sample Type: | U |
| Soil Description: | Greyish brown slightly gravelly very sandy CLAY |  |  |

Sample Preparation: Tested after washing to remove >425um

| As Received Moisture Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 11 | 33 | 17 | 16 | 91 |



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

|  |  |  |  |  |
|---|---|---|---|---|
|  |  | Plasticity |  | Liquid Limit |
| Cl | Clay | L | Low | below 35 |
| Si | Silt | M | Medium | 35 to 50 |
|  |  | H | High | 50 to 70 |
|  |  | V | Very high | exceeding 70 |
|  |  | O | Organic | append to classification for organic material ( eg ClHO ) |

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

**Signed:**

Szczepan Bielatowicz
PL Deputy Head of Geotechnical Section
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**Date Reported:** 23/07/2021

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# TEST CERTIFICATE

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

## Liquid and Plastic Limits

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

| | |
|---|---|
| Client: | IGE Consulting |
| Client Address: | 14-32 Hewitt Street, Manchester,<br>M15 4GB |
| Contact: | Liam McMahon |
| Site Address: | Space Project |

| | |
|---|---|
| Client Reference: | 3534 |
| Job Number: | 21-84894 |
| Date Sampled: | Not Given |
| Date Received: | 02/07/2021 |
| Date Tested: | 08/07/2021 |
| Sampled By: | Client |

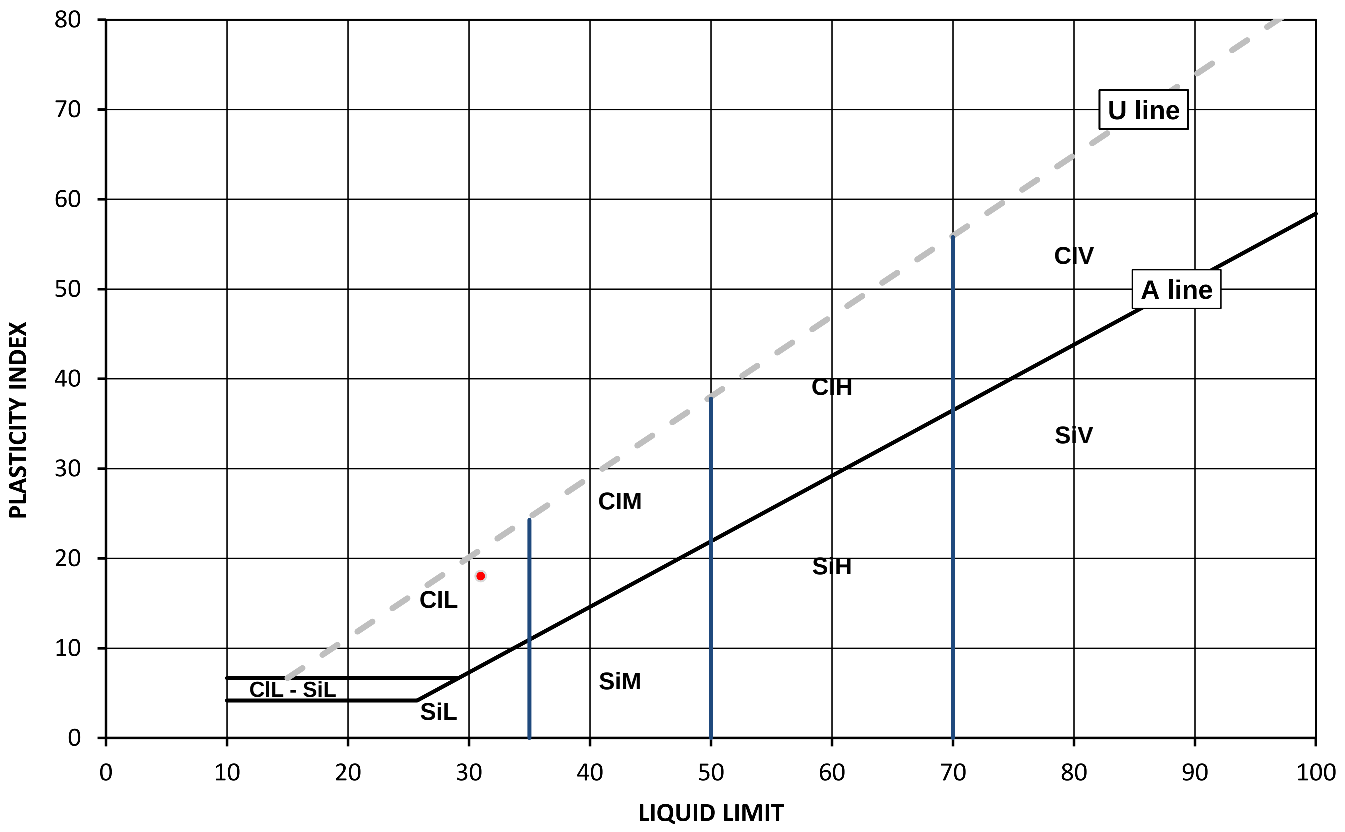
*Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland*

**Test Results:**

| | |
|---|---|
| Laboratory Reference: | 1926275 |
| Hole No.: | BH01 |
| Sample Reference: | Not Given |
| Soil Description: | Brown slightly gravelly very sandy CLAY |
| Sample Preparation: | Tested after washing to remove >425um |

| | |
|---|---|
| Depth Top [m]: | 6.50 |
| Depth Base [m]: | 6.95 |
| Sample Type: | D |

| As Received Moisture Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 9.7 | 31 | 13 | 18 | 90 |



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

| | |
|---|---|
| Cl | Clay |
| Si | Silt |

| Plasticity | | Liquid Limit |
|---|---|---|
| L | Low | below 35 |
| M | Medium | 35 to 50 |
| H | High | 50 to 70 |
| V | Very high | exceeding 70 |
| O | Organic | append to classification for organic material ( eg ClHO ) |

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

**Signed:**

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**Date Reported:** 23/07/2021

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# SUMMARY REPORT

## Summary of Classification Test Results

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Tested in Accordance with:

Moisture Content by BS 1377-2: 1990: Clause 3.2; Water Content by BS EN 17892-1: 2014; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

Client: IGE Consulting
Client Address: 14-32 Hewitt Street, Manchester, M15 4GB
Contact: Liam McMahon
Site Address: Space Project

Client Reference: 3534
Job Number: 21-84894
Date Sampled: Not Given
Date Received: 02/07/2021
Date Tested: 08/07 - 09/07/2021
Sampled By: Client

*Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland*

**Test results**

| Laboratory Reference | Hole No. | Sample | | | | Description | Remarks | Moisture Content [ W ] | Water Content [ W ] | Atterberg | | | | Density | | | Total Porosity# | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Reference | Depth Top m | Depth Base m | Type | | | % | % | % Passing 425um % | WL % | Wp % | Ip % | bulk Mg/m3 | dry Mg/m3 | PD Mg/m3 | % | | |
| 1926274 | BH01 | Not Given | 2.00 | 2.45 | U | Greyish brown slightly gravelly very sandy CLAY | Atterberg 1 Point | 11 | | 91 | 33 | 17 | 16 | | | | | | |
| 1926275 | BH01 | Not Given | 6.50 | 6.95 | D | Brown slightly gravelly very sandy CLAY | Atterberg 1 Point | 9.7 | | 90 | 31 | 13 | 18 | | | | | | |
| 1926271 | BH02 | Not Given | 3.00 | 3.45 | U | Greyish brown slightly gravelly very sandy CLAY | Atterberg 1 Point | 11 | | 83 | 27 | 12 | 15 | | | | | | |
| 1926272 | BH02 | Not Given | 4.00 | Not Given | D | Brown slightly gravelly very sandy CLAY | Atterberg 1 Point | 8.5 | | 78 | 29 | 12 | 17 | | | | | | |
| 1926267 | BH03 | Not Given | 2.00 | 2.45 | U | Greyish brown slightly gravelly very sandy CLAY | Atterberg 1 Point | 15 | | 89 | 29 | 16 | 13 | | | | | | |
| 1926268 | BH03 | Not Given | 5.00 | 5.45 | D | Brown slightly gravelly very sandy CLAY | Atterberg 1 Point | 9.7 | | 82 | 30 | 14 | 16 | | | | | | |
| 1926266 | TP03 | Not Given | 1.20 | Not Given | B | Mottled brown slightly gravelly slightly sandy CLAY | Atterberg 1 Point | 19 | | 97 | 46 | 21 | 25 | | | | | | |
| 1926273 | TP09 | Not Given | 0.90 | Not Given | B | Brown sandy CLAY | Atterberg 1 Point | 23 | | 100 | 41 | 21 | 20 | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

Note: # Non accredited; NP - Non plastic

Comments:

**Signed:**

Szczepan Bielatowicz
PL Deputy Head of Geotechnical Section
**for and on behalf of i2 Analytical Ltd**

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**Date Reported:** 23/07/2021

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# TEST CERTIFICATE

## Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

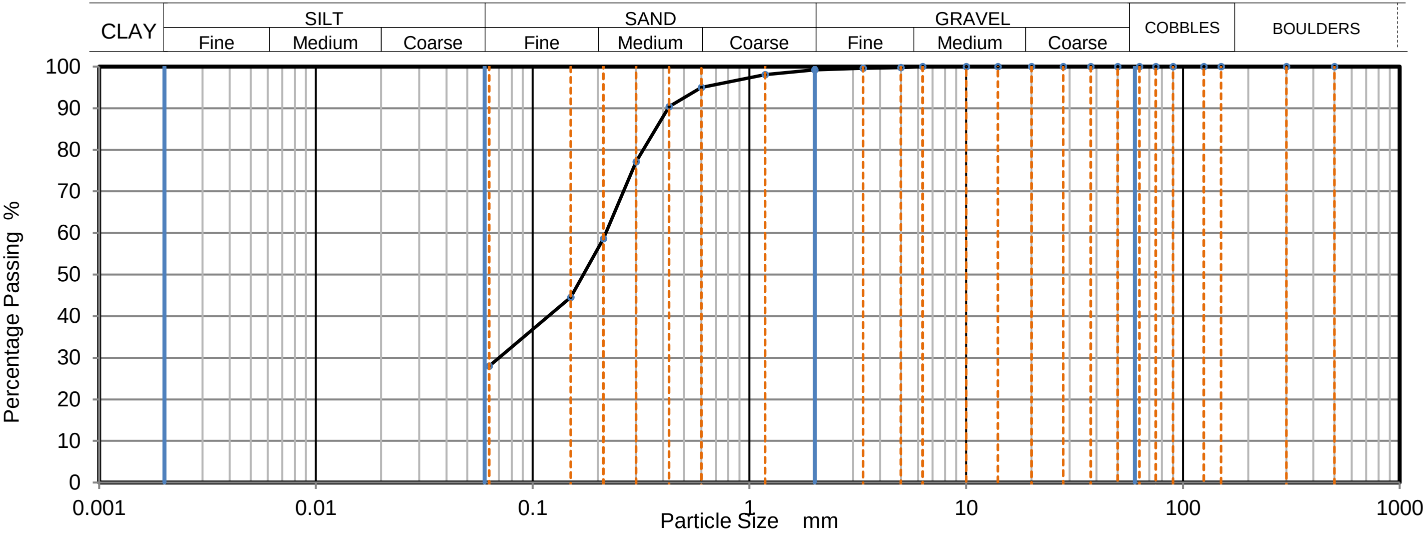
Environmental Science

| | | | |
|---|---|---|---|
| Client: | IGE Consulting | Client Reference: | 3534 |
| Client Address: | 14-32 Hewitt Street, Manchester,<br>M15 4GB | Job Number: | 21-84894 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 02/07/2021 |
| Contact: | Liam McMahon | Date Tested: | 08/07/2021 |
| Site Address: | Space Project | Sampled By: | Client |

*Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland*

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 1926269 | Depth Top [m]: | 2.00 |
| Hole No.: | TP05 | Depth Base [m]: | Not Given |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brown clayey SAND | | |
| Sample Preparation: | Sample was quartered, oven dried at 106.0 °C and broken down by hand. | | |



| Sieving | |
|---|---|
| Particle Size mm | % Passing |
| 500 | 100 |
| 300 | 100 |
| 150 | 100 |
| 125 | 100 |
| 90 | 100 |
| 75 | 100 |
| 63 | 100 |
| 50 | 100 |
| 37.5 | 100 |
| 28 | 100 |
| 20 | 100 |
| 14 | 100 |
| 10 | 100 |
| 6.3 | 100 |
| 5 | 100 |
| 3.35 | 100 |
| 2 | 99 |
| 1.18 | 98 |
| 0.6 | 95 |
| 0.425 | 90 |
| 0.3 | 77 |
| 0.212 | 59 |
| 0.15 | 45 |
| 0.063 | 28 |

| Sedimentation | |
|---|---|
| Particle Size mm | % Passing |
| | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 1 |
| Sand | 71 |
| | |
| Fines <0.063mm | 28 |

| Grading Analysis | | |
|---|---|---|
| D100 | mm | 6.3 |
| D60 | mm | 0.218 |
| D30 | mm | 0.0687 |
| D10 | mm | |
| Uniformity Coefficient | | > 3.5 |
| Curvature Coefficient | | |

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

**Signed:**

Szczepan Bielatowicz
PL Deputy Head of Geotechnical Section
**for and on behalf of i2 Analytical Ltd**

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**Date Reported:** 23/07/2021

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# TEST CERTIFICATE

## Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client: IGE Consulting
Client Address: 14-32 Hewitt Street, Manchester, M15 4GB
Contact: Liam McMahon
Site Address: Space Project

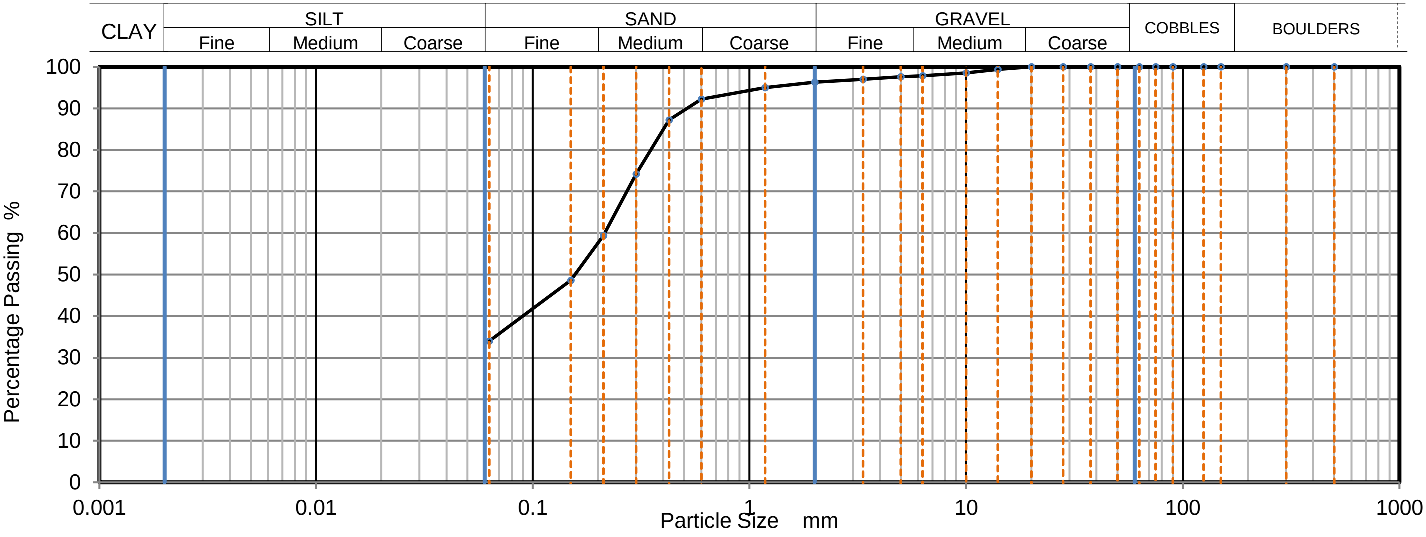
Client Reference: 3534
Job Number: 21-84894
Date Sampled: Not Given
Date Received: 02/07/2021
Date Tested: 08/07/2021
Sampled By: Client

*Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland*

**Test Results:**

Laboratory Reference: 1926270
Hole No.: TP07
Sample Reference: Not Given
Sample Description: Brown slightly gravelly very clayey SAND
Sample Preparation: Sample was quartered, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 1.70
Depth Base [m]: 2.00
Sample Type: B



| Sieving | |
|---|---|
| Particle Size mm | % Passing |
| 500 | 100 |
| 300 | 100 |
| 150 | 100 |
| 125 | 100 |
| 90 | 100 |
| 75 | 100 |
| 63 | 100 |
| 50 | 100 |
| 37.5 | 100 |
| 28 | 100 |
| 20 | 100 |
| 14 | 99 |
| 10 | 99 |
| 6.3 | 98 |
| 5 | 98 |
| 3.35 | 97 |
| 2 | 96 |
| 1.18 | 95 |
| 0.6 | 92 |
| 0.425 | 87 |
| 0.3 | 74 |
| 0.212 | 59 |
| 0.15 | 49 |
| 0.063 | 35 |

| Sedimentation | |
|---|---|
| Particle Size mm | % Passing |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 4 |
| Sand | 62 |
| | |
| Fines <0.063mm | 35 |

| Grading Analysis | |
|---|---|
| D100 mm | 20 |
| D60 mm | 0.215 |
| D30 mm | |
| D10 mm | |
| Uniformity Coefficient | > 3.4 |
| Curvature Coefficient | |

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

**Signed:**

Szczepan Bielatowicz
PL Deputy Head of Geotechnical Section
**for and on behalf of i2 Analytical Ltd**

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**Date Reported:** 23/07/2021

# APPENDIX 11

# INTEGRA CONSULTING PHASE 1 GEO-ENVIRONMENTAL REPORT (2015)

# PHASE 1 GEO-ENVIRONMENTAL GROUND INVESTIGATION
# AT
# SPACE PROJECT, GORTON, MANCHESTER
# FOR
# MANCHESTER CITY COUNCIL

Integra Consulting Environmental
Suite Four
14-32 Hewitt Street
Manchester
M15 4GB

Tel 0161-237-3400
Fax 0161-923-4787
Email environmental@integraconsulting.co.uk

Ref: 2913
Rev: -
By: MC

Date: Oct 2015

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## 1.0 INTRODUCTION

This Phase 1 Geo-Environmental Ground Investigation and report has been prepared at the request of Mr Ken Richards of Manchester City Council (MCC).

Instructions to proceed were received on 15th September 2015. Desk study work was undertaken between 24th September and 21st October 2015.

Due to the nature of the numerous build phases across the approximately 6.8 hectare site and the varying scope of works for each build phase, the site has been subdivided into six sub-sections, as noted on the plan in Appendix 1 and detailed in Section 6.1 – these include:

- Area A – Former Fujitsu site
- Area B – Former Fujitsu site and existing operational land
- Area C – Former Microsystems site
- Area D – Former Fujitsu site and existing Space car park
- Area E – Existing MCC car park
- Area F – Former Armstrong Pumps / Baric Pumps site

This Phase 1 report is to be used for submission to the Local Authority as part of the planning application as it is the Client's intention to develop the site, known as the Space Project, via several build phases into several buildings containing production stages, flexible space / office space, workshops / stores and small business units with associated externals.

The proposed development plan is contained in Appendix 11. Please note that this is not the finalised development plan and is therefore subject to change.

## 2.0 BRIEF

Due to the six sub sections of the site the brief is variable dependent on the site areas for the Space Project, West Gorton as indicated on the plan in Appendix 1 and detailed in Section 6.1.

The investigation was to include for the following studies:

a) Assess the probable ground conditions on and below the site on the basis of existing and historic site and relevant off site documentation for all areas.

b) Identify probable contaminants / sources of contamination that may be present at the site using current contaminated land guidance and develop a conceptual site model for potential human health and controlled waters receptors for areas B and D.

c) On the basis of the Undertake a Preliminary Risk Assessment – which will determine the requirement for further environmental (contaminated land) investigation and assessment for areas B and D.

d) Design on the basis of the anticipated ground conditions appropriate geotechnical site investigation works and discuss potential development issues i.e. sub-surface features – obstructions, compressible ground, faulting, mineral extraction, mining and land instability for areas B, D, E and F.

No geotechnical, geological or environmental (contaminated land) assessment of Area A and C is deemed necessary due to the presence of existing reports which have been deemed suitable – as per the Client's request they have been summarised within this report for completeness and ease of review.

A summary of the information / data sources is detailed in Section 5.2.

A detailed report was to be provided to summarise findings and to provide recommendations.

## 3.0 LIMITATIONS OF INVESTIGATION WORK AND REPORT

### Desk Study References

For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed that it is correct. No attempt has been made to verify this information. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

The desk study has been produced using historical Ordnance Survey maps and environmental maps available at the time the report has been produced. The environmental information used was the current information available at the time of writing but there is no absolute guarantee of accuracy.

Historical Ordnance Survey maps do not provide a comprehensive description of a site history. They provide details of the site from a date prior to the publication of the map (i.e. a snapshot in time). The period between map editions can be substantial (i.e. several decades). Not all map series are available for every date range in many areas of the UK and therefore there will be gaps in this mapped record for some sites. Potentially contaminative land uses could have been present and removed during such periods and may therefore not form a part of this particular record. In addition, there will be potentially contaminative land uses which are not identified on the map records such as small scale storage / use of hazardous materials, illegal / unlicensed waste disposal activities etc.

Different map series identify different features utilising different symbols which can result in features that remain on site being removed from maps. Some features are also not mapped for security reasons i.e. airfields and other military installations. These areas are mostly shown as blank areas on historical maps.

### Site Walkover

During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not be made known or accessible.

## Exploratory Holes

Where the spacing of exploratory holes for future intrusive investigation work has been presented as part of this report, the spacing has been determined to provide a reasonable indication of the general ground conditions and extent of land / groundwater contamination on the site but the number has ultimately been limited by commercial constraints. The ground conditions at the proposed exploratory holes are no absolute guarantee of the ground conditions between such locations. Due allowance should be made for the possibility of variation in conditions between exploratory hole locations when preparing any assessments of the final foundation and land / groundwater remediation proposals.

## Extent of Contamination Studies

This report is strictly limited to the nature of contamination contained within the ground and groundwater at the site. The report does not cover environmental aspects such as air or noise pollution and ground vibrations and the like. In addition, ecological matters relating to wildlife, flora and fauna have not been investigated as part of this report. In particular, the site has not been inspected for the presence or otherwise of invasive species e.g. Japanese Knotweed. It is recommended that the Client appoints a specialist in this subject to carry out a detailed inspection / survey of the site if its presence is suspected. Where mention has been made to the identification asbestos or asbestos-containing materials this is for indicative purposes only and do not constitute or replace full and proper surveys.

If an Unexploded Ordnance (UXO) report has been obtained within the report, it has been so on the basis of Health and Safety concerns and no assessment has been made other than transcribing the recommendations of the sub-contractor contained within the report. In terms of a potential contaminative source, unless ordnance has been manufactured / stored on site, UXOs will only be determined as a contaminative source following a positive identification on site.

When investigating, or developing, potentially contaminated land it is important to recognise that sub-surface conditions may vary spatially and also with time. The absence of certain ground, ground gas, and contamination or groundwater conditions at the positions tested is not a guarantee that such conditions do not exist anywhere across the site. Due to the presence of existing buildings and structures access could not be obtained to all areas. Additional contamination may be identified following the removal of the buildings or hardstanding.

Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.

The conclusions section of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the reporting full. The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the site.

## Flooding

Flooding in this report is defined as flooding caused by the sea, ditches, rivers, streams, ponds, lakes, reservoirs and the like. It does not extend to flooding caused by surcharged piped drainage systems and investigations into flooding of this nature are excluded from this report.

## 4.0 **THIRD PARTIES**

This report has been prepared for the sole use of Manchester City Council. It must not be copied or passed onto any third party or used for any purpose other than which it was prepared without the permission of the author. This report is copyright.

## 5.0 SCOPE OF INVESTIGATION WORK

### 5.1 Walk Over Survey

Areas E and F were visited during clear and cold weather conditions and the objectives of the site walkover were, where applicable:

- to assess site access and potential investigation locations and constraints.
- to assess any visual subsurface geotechnical features / anomalies e.g. foundations, made ground, subsidence etc.

Due to the active nature of Area A and the significant alterations to occur on site it was not deemed suitable for a site walkover at this stage.

The walk over surveys was carried out on 17th September and 13th October 2015.

Photographs were taken of site during the walkover surveys and these photographs together with a plan indicating the location and direction of the photographs are contained in Appendix 2.

### 5.2 Desk Study Documentation

The following documents were obtained and examined during the desk study:

a) An aerial photograph of the site dated circa 2009. The photograph is contained in Appendix 1.

b) Historical Ordnance Survey maps as follows:

| Date of Publication | Scale |
|---|---|
| 1848 | 1:10,560 |
| 1882 | 1:10,560 |
| 1893 | 1:2,500 |
| 1894 | 1:10,560 |
| 1899 | 1:10,560 |
| 1908 | 1:2,500 |
| 1909 | 1:10,560 |
| 1911 | 1:10,560 |

| | |
|---|---|
| 1922 | 1:2,500 |
| 1923 | 1:10,560 |
| 1932-1933 | 1:10,560 |
| 1938 (2No.) | 1:10,560 |
| 1948-1950 | 1:1,250 |
| 1950-1951 | 1:2,500 |
| 1953-1979 | 1:1,250 |
| 1956 | 1:10,000 |
| 1964-1967 | 1:2,500 |
| 1968 | 1:10,000 |
| 1975 | 1:25,000 |
| 1975-1976 | 1:1,250 |
| 1975-1990 | 1:1,250 |
| 1977-1983 | 1:1,250 |
| 1981 | 1:10,000 |
| 1985-1988 | 1:1,250 |
| 1987 | 1:10,000 |
| 1992 (2No.) | 1:1,250 |
| 1993 | 1:10,000 |
| 1993-1995 | 1:1,250 |
| 1995 | 1:1,250 |
| 1996 (2No.) | 1:1,250 |
| 2006 | 1:10,000 |
| 2015 | 1:10,000 |

These maps and the Landmark Historical Data report are contained in Appendix 3.

c) Environmental maps dated 1999-2015 obtained through Envirocheck as follows:

- Environment Agency and hydrological map
- Groundwater vulnerability map
- Sensitive land uses map
- Summary maps showing locations of recorded waste sites, industrial land use sites and hazardous substances sites in adjacent areas.

These maps are contained in Appendix 4.

d) An environmental report obtained from Landmark, the environmental database company, which provides a list of recorded past and present activities at or adjacent to the site which could have an impact on the levels of contamination in the soils and groundwater at the site. This report is contained in Appendix 5.

e) The British Geological Survey solid and drift map (reference: SJ89NE). The extracts have been copied under licence from the British Geological Society – CO7/044 LSCSL. Two BGS borehole logs were obtained (reference: SJ89NE 127 and SJ89NE274). A part extract of the map covering the area under consideration, a copy of the borehole logs and the Landmark Mining and Ground Stability report are contained in Appendix 6.

f) Coal Authority Mining Report reference: 51001007086001. This report is contained in Appendix 7.

g) A visit was made to the Coal Authority was undertaken on Wednesday 14h October 2015 to supplement the research. A Coal Authority abandonment plan obtained during the visit is attached in Appendix 7.

h) The Indicative Atlas of Radon in England and Wales published by the British Geological and the Health Protection Agency was examined to assess the probable presence or otherwise of radon gas in the ground. An extract of the relevant maps is contained in Appendix 8.

i) The following previous site investigation works undertaken by Integra Consulting were undertaken across the following site sections:

- Area A:
  - Integra Consulting Phase 1 Geo-Environmental Ground Investigation Report (dated March 2013) (Project ref: 2692).
  - Integra Consulting Phase 2 Environmental Ground Investigation Report (dated June 2013) (Project ref: 2692).
  - Integra Consulting Geotechnical Ground Investigation Report (dated June 2013) (Project ref: 2692).

- Area C:
  - Integra Consulting Phase 1 Geo-Environmental Ground Investigation Report (dated February 2014) (Project ref: 2802).

  - Integra Consulting Phase 2 Environmental Ground Investigation Report (dated June 2014) (Project ref: 2802).
  - Integra Consulting Geotechnical Ground Investigation Report (dated May 2014) (Project ref: 2802).

The following site investigation works were obtained, with permission, from the Client:

- Atkins Environmental Assessment for New East Manchester – Fujitsu Main Site *(Area A, B, D and E),* Unit 1 *(off site),* Baric Pumps *(Area F)* and Car Park *(off site)* (dated June 2006)
- Area F (Former Armstrong Pumps Site):
  - Curtins Consulting Ltd Phase 1 Detailed Desk Top Study (dated February 2015).
  - Curtins Consulting Ltd Phase 2 Intrusive Investigation (dated June 2015).
  - Curtins Consulting Ltd Outline Remediation Strategy with Engineering Operations (dated May 2015).
  - Capital Programmes and Property Asbestos Group – Final demolition asbestos survey group (dated 22nd May 2015).

The above reports are referenced within this report but are not included within the appendices – these can be supplied upon request.

## 6.0 FINDINGS

### 6.1 Description of the Site

The approximately 6.8 hectare site is located in urbanised areas of West Gorton, Manchester at Ordnance Survey grid reference E386950, N397000. The site is bounded by Wenlock Way to the south, Aines Street and an industrial building to the east, industrial buildings, Bennett Street and Vaughan Street to the north and Kniveton Street to the west. An aerial photograph of the site prior to works commencing is also contained in Appendix 1. Site levels are typically flat with slight engineered gradients across the site and localised steep changes between site areas and highways and / or other site areas. Ornamental and mature trees are located typically along Area boundaries and abutting the site boundaries up to a height of approximately 15m.

Corn Brook, a surface water / culverted water feature is present trending west to east along the boundary between Area C and D and through the northern site section of Area F (where it becomes an open water course for part of its route).

Due to the nature of the numerous build phases and the varying scope of works for each build phase the site has been subdivided into six sub-sections, as noted on the plan in Appendix 1. As detailed below:

- Area A: Former Fujitsu site - relates to the Build Phase 1 of the Space Project, located in the north western site section. This build phase has been completed consisting of a production stage, flexible space / offices and workshop / stores along with associated external areas.
- Area B: Former Fujitsu site and existing operational land – relates to the Build Phase 3 / 4 of the Space Project, located in the south western site section. This area consists of a tower block with associated abutting buildings and externals areas which is occupied by MCC and at present it is proposed for the area to be developed into production stage, flexible space / offices and workshop / stores along with associated external areas.
- Area C: Former Microsystems site – relates to an unknown development stage in the northern section of the site. Following demolition of the previous site building, the site consists principally of a development platform which

batters up from Vaughan Street to the north. Corn Brook is noted to be culverted along the southern boundary of this area abutting Area D.

- Area D: Former Fujitsu site and existing Space car park – relates to an existing car park with localised soft landscaped areas associated with the Build Phase 1 of the Space Project (Area A) located in the central section of the site.
- Area E: Existing MCC car park – relates to Build Phase 2 of the Space Project (along with Area F) located in the southern site section. At present it is proposed for the area to be developed into production stage, flexible space / offices and workshop / stores along with associated external areas.
- Area F: Former Armstrong Pumps / Baric Pumps site - relates to Build Phase 2 of the Space Project (along with Area E) located in the eastern site section. The site currently consists of a multi-storey masonry and steel clad building with associated hardstanding external areas with localised areas of trees and shrubs across the site extremities.

## 6.2 Walk Over Survey

Areas E and F were visited on 17th November and 12th October 2015, both in overcast, cool and dry conditions. The principal observations relating to the geotechnical intrusive investigation were as follows:

Geology

The Armstrong Pumps site (Area F) consists predominantly of a disused multi-storey steel framed factory building with areas of externals. Ground floor levels were noted to vary throughout the building notably between the east and main central section and the loading bay to the north. Basements were noted to be present of which access was obtained on one occasion on the southern site boundary. Wooden covers were noted to be present however these could not be removed during the walkover survey. Standing water was noted inside the building on a number of occasions associated with slight depressions within the ground floor slab. An electricity substation was noted to be present on the southern site boundary.

External areas are overlain predominantly by hardstanding with the exception of a small area of soft landscaping to the west. A small, derelict brick building is present

in the northern site section next to the only exposed section of surface water course Corn Brook which is culverted under the site and flows from east to west.
There is a notable amount of overgrown vegetation along fences, in drains and particularly within areas in the northern site section where a number of trees are present. A lot of this vegetation appears to have grown as the site has fallen into disrepair. It should be noted that the site has not been surveyed for presence of evasive species e.g. Japanese Knotweed, Himalayan Balsam.

Surface water drainage is present in the external areas, evidenced by channel drains and man holes. It is likely that disconnected services will be present beneath the slab associated with former factory machinery and historic manufacturing processes.

Area E is noted to be elevated at approximately 2m below the level of Area F. The site consists of two areas elevated at approximately 51.5m AOD in the east and 52.1m AOD in the west with a sloped section of road connecting the two. There is a tree located to the north-west and a large street light in the central site section. Ground instability was noted in the form of differential movement evidenced by the presence of surface tension cracks in the macadam surface, particularly in areas where services are located. A layer of concrete was exposed in the western site section, where macadam appears to have been laid directly onto this surface.

Access to Area F can be obtained via a number of gates off Aines Street. A spoil bund and two large tyres require removal to gain access via the most northerly gate on this road. Access to the former Armstrong Pumps building can be obtained by using the various shutters / gates which were used when the factory was active. Only the shutters / gates which can be opened manually can be used to access the building as mains power has been disconnected from the site. The MCC car park can be accessed via the entrance to the carpark off Wenlock Way.

Photographs taken during the walkover survey together with a plan indicating the location and direction of the photographs are contained in Appendix 2.

## 6.3 Site History

The site development history has been researched by reference to historical maps and street plans. These are included in Appendix 3 to this report and the principal observations which are summarised into on-site history and off-site history are summarised below.

On-site History

| Dates | | Site Features |
|---|---|---|
| **From** | **To** | |
| Before 1848 | 1848 | Site is predominantly open fields. Corn Brook flows through the site from the East via the north of Area F and crosses Areas C and D. A bleach and dye works is noted to be present predominantly across Areas D, E and F. Small features possibly representing ponds or small reservoirs are present in Areas E and F. |
| 1848 | 1893 | Residential terraced housing is constructed in the south-western site section of Area B. Union Iron Works is located within the southern site section of the wider site, covering parts of Areas A, B, D and E. A reservoir is present to the east of Area A. Dalton Chemical Works within Area D is present to the south of Corn Brook which has had its course straightened across Area F. An unnamed engineering works and iron works named “Works of the Ant & Bee” are located within the southern section of Area F. The suspected small ponds / reservoirs are no longer present across Areas E and F. A tank is noted within Area D. |
| 1893 | 1909 | Dalton Chemical Works is no longer present, some remaining buildings are now in use as part of the Union Iron works which is expanded during this time period. The housing in the south-west of Area B is expanded to the north. |
| 1909 | 1923 | Gorton Brooks Chemical works is expanded onto the northern site section of Area F. Buildings and chimneys have been constructed associated with the Union Iron Works. Corn Brook has been culverted beneath Area C but remains open across the northern section of Area F. |
| 1923 | 1938 | Buildings associated with Gorton Brook Chemical Works are no longer present in the north of Area F. |
| 1938 | 1956 | Union Iron Works has undergone significant expansion with a new building present across Areas A and D and the former engineering works and adjacent building on Area F all enveloped into a works which now covers the majority of the wider site. A tramway and buildings marked “ruins” are present in the northern site section of Area F. |
| 1956 | 1967 | No significant change noted. |
| 1967 | 1979 | Terraced residential buildings to the west of Area B have been replaced with buildings noted in later mapping as works associated with the Manchester City Council offices |

| | | |
|---|---|---|
| 1979 | 1987 | The Microsystems structure is constructed within Area C. The Union Iron Works are no longer present. A building marked “works” is present across the majority of Area A. |
| 1987 | 2014 | No significant change noted. |
| 2014 | Present | The microsystems building in Area C is demolished. Structures on Area A are refurbished into a drama hub as part of the first stages of the Space project. |

## Off-site History

| Dates | Features | Distance and Direction |
|---|---|---|
| 1848 - 1922 | Ardwick Chemical Works | 10m North |
| 1848 - 1933 | Chemical Works | 0m East |
| 1848 - 1909 | Lime Works | 750m North West |
| 1894 - 1968 | Terraced Housing | 10m South |
| 1890 - 1983 | St Benedict’s Church | 100m West |
| 1893 - 1908 | Brick Field | 80m North |
| 1908 - 1985 | School | 10m East |
| 1909 - 1938 | Boiler Works | 250m West |
| 1923 - 1956 | Pulley Works | 60m North East |
| 1933 - 1975 | Brook Forge | 10m North |
| 1956 - 1987 | Ardwick Works | 60m North East |
| 1968 - 1993 | Works | 20m North |
| 1981 - 2013 | Housing | 20m South |
| 1992 – Present day | Vaughan Industrial Estate | 200m North |

At the time of the earliest historic mapping in 1848, the adjacent land use was predominantly rural with the exception of Gorton Chemical Works located approximately 50m to the east and Ardwick Chemical Works immediately north of the site. The Ardwick Lime Works are noted along with a number of lime pits approximately 750m to the north-west in the town of Ardwick. It is understood that limestone was removed and utilised to produce bricks. All works associated with the removal of limestone are understood to have ceased by 1888. By the late 19th Century the area has undergone significant development as the area to the south is developed into terraced housing. A brick field is present immediately north of the site. The Manchester, Sheffield and Lincolnshire Railway and Crewe and Manchester Line have been constructed to the north and west respectively and a coal and mineral depot is noted 500m north-west, utilising these rail tracks. By 1909 numerous works constructed in close proximity to the site e.g. pulley works to the north. The residential housing too has expanded, particularly to the south-east. By mid-late 20th Century the former brickfield is developed into a number of industrial uses including the Ardwick Works and various depots. The terraced housing to the south is demolished by the 1970s and replaced with lower density residential housing in the 1980s. The immediate area surrounding the site did not record significant change until recently when the housing to the south of the site were demolished to make way for modern housing.

### 6.3.1 Historical Data Report

The following historical land use information relating to historical land use on-site has been obtained from the Landmark reports, published information and the walkover survey can be summarised as follows:

- 4 No. potentially contaminative industrial uses on-site associated with chemical manufacturing between 1848 and 1923, metal casting / foundries between 1909 and 1956 and unspecified factory or works between 1956 and 1993
- 27 No. potentially contaminative industrial uses off-site associated with a range of sources including machinery, railways, chemical manufacturing, electricity production, metal casting, etc.
- 3 No. electrical sub-station facilities are noted on-site between 1949 and 1979.
- A tank is noted on site between 1948 and 1967.
- Various other substations, tanks and a gas industry facility is noted within 100m of the site.

See the Historical Data Report attached in Appendix 3 for specific locations and further details of the above mentioned potential sources of contamination.

### 6.3.2 Unexploded Ordnance Report – Historical information

As discussed Section 6.10, a detailed Unexploded Ordnance (UXO) Threat and Risk Assessment report was obtained for the site and it noted that an unspecified factory building in the eastern site section was used for the manufacture and storage of munitions during WWI. The presence of possible bomb ruins were noted within Area F in the WWII era.

## 6.4 Geology

### 6.4.1 BGS Geological Map

The BGS geological map of the area (reference: SJ89NE) indicates that the site is overlain by superficial deposits of glacial till (formerly boulder clay) underlain by solid geology consisting of the Halesowen Formation which comprises mudstone with subordinate beds of sandstone and limestone. These limestone bands include the Great Mine Limestone noted as being between 1.5m and 2.7m in thickness noted to subcrop (conjectured) trending north west to south east across the site dipping to the south west (suspected dip of 18°) across Area B, D and E/F boundary. It should be noted that other limestone bands are recorded to be present within the geological sequence up to 1.1m in thickness.

The BGS geological map indicates that localised areas of ‘Infilled Ground – mainly backfilled brick pits and infilled canal and rail cuttings’ are present on the western extremity of Area F and the south eastern section of Area E.

Extracts of the geological map are contained within Appendix 6.

### 6.4.2 BGS Borehole Logs

There was a single BGS Borehole available on site, namely:

SJ89NE 127

This borehole was located approximately in close proximity of the boundary between Area A, D and E in the centre of the site and was constructed at an unknown date but is envisaged to fate from around the turn of the Twentieth Century.

The borehole typically recorded the following strata:

- 'Earth' to a depth of 1.83m (49.85m AOD) underlain by
- Grey Clay to a depth of 10.97m (40.71m AOD) underlain by
- Grey / Red / Black Shale to a depth of 34.75m (16.93m AOD) underlain by
- Interbedded layers of limestone and fireclay to a depth of 46.03m (5.65m AOD) underlain by
- Suspected sandstone to a depth of at least 61.27m where the borehole was terminated.

Furthermore, a BGS borehole (reference SJ89NE274) located 30m west of the site constructed in 1966 at a 167 feet AOD (50.9m AOD) recorded the following ground conditions:

- Made ground to a depth of approximately 0.75m bgl (50.15m AOD) underlain by
- Moist red sand with bands of clay to a depth of 2.2m bgl (48.7m AOD) underlain by
- Very stiff, sand boulder clay with occasional sand pockets to 8.23m bgl (42.67m AOD) underlain by
- Red mudstone to a depth of 8.5m (42.4m AOD) underlain by
- Fairly muddy grey limestone to a depth of 10m (40.9m AOD) underlain by
- Pinkish grey silty calcareous mudstone to a depth of 13.2m (37.7m AOD) underlain by
- Grey muddy limestone to a depth of 14.3m bgl (36.6m AOD) underlain by
- Pink and grey very calcareous silty mudstone to a depth of 22.86m bgl (28.04m AOD).

No groundwater was recorded on the borehole log.

### 6.4.3 BGS Estimated Soil Chemistry

The BGS have estimated that Glacial Till across the site are anticipated to naturally comprise of the following determinands:

- Arsenic 15-35mg/kg
- Cadmium <1.8-2.2mg/kg
- Chromium 60 – 90mg/kg
- Lead 150-600mg/kg
- Nickel 30-45mg/kg

## 6.5 Mining and Ground Stability

### 6.5.1 Coal Mining

The Coal Authority Mining report was obtained on the basis that the site is within a recognised coal production area. The report states that the site is in the likely zone of influence from workings in 4 No. seams of coal at 280m to 1080m depth, and last worked in 1957. The Landmark mining report identified 2 No. potential mining areas on-site associated with the Bradford and Clayton Collieries extracting the Four Foot and Picket coal. The Coal Authority have stated that any ground movement from these coal workings should have stopped by now.

No other issues were raised in the Coal Authority report relating to present or future working of coal seams (other than the usual reserved rights for extraction of remaining coal or undocumented historical shallow mine workings).

During a visit to the Coal Authority to inspect the Abandonment Plans, it was noted that fireclay associated with the mined coal seams was also extracted.

### 6.5.2 Brine Extraction

The site lies outside of the Cheshire Brine Subsidence Compensation area.

### 6.5.3 Limestone Mining / Dissolution

An inspection of a limestone abandonment plan at the Coal Authority and at Manchester Central Library indicated that the area to the north-west had extracted the Great Mine Limestone seam (1.5m-2.7m in thickness) together with other thinner limestone deposits i.e. Yard Mine Limestone (1.1m in thickness) and Half Yard Mine Limestone (0.8m in thickness) from a number of BGS recorded mineral sites. It is understood that limestone was removed from a series of pits known as the Ardwick Lime Works Pits and utilised for brick making. The abandonment plan recorded that all limestone extraction had ceased by 1888 and was extracted at its closest point at 800m north-west (Beswick), although the Envirocheck Land Instability Report, states that extraction of the Great Mine Limestone had occurred 42m north-west of the site. The risk of unrecorded mining / extraction cannot be discounted.

Finally, due to the calcareous nature of the limestone deposit the risk of dissolution leading to natural formed unrecorded cavities cannot be discounted.

### 6.5.4 Superficial deposits (glacial till) extraction

As indicated on the BGS geological and historical records the potential for surface extraction of superficial deposits typically for the use in the manufacture of brick was prevalent across the local area.

2 No. BGS recorded brickworks / clay pits are recorded within 500m of the site and 9 No. within 1000m. The closest brick field was noted to be approximately 15m to the west of the site between 1893 and 1908.

### 6.5.5 Ground Stability Data

The below table summarises the ground stability hazard types and potential, as supplied by Envirocheck:

| Hazard Type | Hazard Potential |
|---|---|
| Landslide | Very Low |
| Running sand | Very Low |
| Shrinking or swelling clay | Very Low |
| Collapsible ground | Very Low |
| Compressible ground | No Hazard |
| Dissolution | No Hazard |

Motion Map Data

There are 57 No. motion map data points located on site or within 100m of the site which recorded velocities ranging between -1.4mm/year and 2.3mm/year.

## 6.6 Previous Site Investigations

Each previous site investigation has been appraised based upon the objectives of the report stated within Section 2.0.

- Area A:
    - Integra Consulting Phase 1 Geo-Environmental Ground Investigation Report (dated March 2013) (Project ref: 2692).
    - Integra Consulting Phase 2 Environmental Ground Investigation Report (dated June 2013) (Project ref: 2692).
    - Integra Consulting Geotechnical Ground Investigation Report (dated June 2013) (Project ref: 2692).

The findings of the above Phase 1 Geo-Environmental Ground Investigation Report noted that historically the site has been occupied by numerous industries including bleach, dye, iron and chemical works up until the early to mid Twentieth Century where it was subsequently utilised as an Electrical Engineering Works (Fujitsu) and office block until 2013. On this basis potential significant made ground deposits were anticipated underlain by stiff glacial till which is in turn underlain by bedrock at 10m bgl. The findings of the report indicated that a low to moderate potential risk to human health including ground gas and a moderate risk to controlled waters due to potential contamination associated with the previous historical site uses, the unknown nature of the made ground deposits and the numerous potential ground gas sources located on and adjacent to the site. Consequently, a Phase 2 environmental intrusive investigation was deemed necessary including appropriate chemical testing off site materials and waters with groundwater / ground gas monitoring. Furthermore, site investigation works to fulfil the geotechnical requirements, site investigation works should be undertaken to allow deign of the build and to investigate suspected subsurface features such as infilled reservoirs, historic foundations and ground slabs may be present beneath the site.

The site investigation works incorporated the excavation of 16 No. trial pits and the construction of 7 No. shell and auger boreholes and recorded the following typical ground conditions:

- MADE GROUND consisting of either reinforced concrete slab or topsoil underlain by
- MADE GROUND of sub-base within internal building envelopes, macadam underlain by sub-base in areas of external hardstanding or topsoil with frequent brick and concrete fragments within areas of soft landscaping underlain by

- MADE GROUND consisting of a variety of materials including sands, angular slag, brick, concrete, sandstone gravels and firm, soft in places, clays with occasional brick and concrete fragments. These made ground deposits were present to a maximum depth of 3.80m bgl, and are in turn underlain by
- Natural strata consisting of stiff to very stiff, brown, grey in places, slightly gravelly, sandy CLAY with occasional sandstone and siltstone cobbles and rare layers of sand between 0.10m to 0.80m in thickness. This clay typically becomes very stiff with depth and is subsequently underlain by
- Strong SANDSTONE bedrock (where encountered within shell and auger boreholes at a minimum depth of 8.30m bgl).

The Phase 2 Environmental Ground Investigation concluded on the basis of 20 No. solid chemical tests for an extensive suite of determinands that the site poses a low risk to both human health and controlled waters receptors due to the lack of a significant contaminative source, low risk exposure pathways for both human health and controlled waters and the low sensitivity of the receptors. Consequently no remedial works are recommended for the proposed development other than the requirement for testing of imported material across soft landscaped areas and waste transfer documentation – which was validated in July 2014.

The conclusions of the Geotechnical Ground Investigation Report stated that, following inspection and on the basis of no net increase of load, the existing foundations of the former Fujitsu computer hall can be utilised as a part of the proposed renovation development of the building. In areas where there is an increased load to the foundations, then it is proposed that new piled foundations are utilised, bearing onto the underlying natural stiff clays, subject to detailed inspection / advice from specialist piling contractors. Within the northern site area, in the area it was recommended that either ground improvement techniques in the form of vibro-compaction or piled foundations are utilised subject to detailed inspection / advice from specialist ground improvement / piling contractors. It was determined that the existing ground bearing floor slab could be extended and the new build sections of the site utilise a suspended floor slab due to the significant amount of up-fill required within this area to mitigate the need for retaining walls associated with the level difference between the extremities of the proposed units.

- Area C:
    - Integra Consulting Phase 1 Geo-Environmental Ground Investigation Report (dated February 2014) (Project ref: 2802).
    - Integra Consulting Phase 2 Environmental Ground Investigation Report (dated June 2014) (Project ref: 2802).
    - Integra Consulting Geotechnical Ground Investigation Report (dated May 2014) (Project ref: 2802).

The findings of the above Phase 1 Geo-Environmental Ground Investigation Report noted that historically, the site was associated with a nearby Chemical Works in the early Twentieth Century, before being redeveloped in the 1980's by Microsystems into a light industrial unit which was demolished in 2014. On this basis potential significant made ground deposits were anticipated underlain by stiff glacial till, which is in turn underlain by bedrock at a depth of approximately 10m below ground level. The conclusions of the report was there is a low to moderate potential risk to human health including ground gas and a moderate risk to controlled waters due to potential contamination associated with the previous historical site uses, the unknown nature of the made ground deposits and the numerous potential ground gas sources located on and adjacent to the site.

Consequently, a Phase 2 environmental intrusive investigation was deemed necessary including appropriate chemical testing of site materials and waters with groundwater / ground gas monitoring. Furthermore, to fulfil the geotechnical requirements, site investigation works should be undertaken to allow design of the build and to investigate suspected subsurface features such as infilled water bodies, historic foundations and ground slabs which may be present beneath the site.

The site investigation works incorporated the excavation of 12 No. trial pits and the construction of 8 No. shell and auger boreholes and recorded the following typical ground conditions:

- MADE GROUND principally comprising macadam and reinforced concrete recorded to a depth of approximately 0.18mbgl underlain by;
- MADE GROUND comprising dense, grey, subangular to subrounded fine to medium GRAVEL of mixed lithologies recorded between

51.85m and 50.95m AOD to a depth of between 0.20m and 0.70m bgl, underlain by;

- MADE GROUND of a varied nature, principally comprising dense, black, gravelly SAND with frequent whole bricks and occasional red brick, concrete and fused slag fragments recorded between 51.68m and 50.30m AOD to a depth of between 2.00m and 4.70m, underlain by;
- Natural deposits comprising stiff, brown, slightly gravelly, slightly sandy, silty CLAY recorded between 48.88m and 46.71m AOD to a depth of between, at least, 6.45m and 8.45m bgl, where exploratory holes were terminated.

Obstructions were encountered across the site within the made ground deposits, including a layer of brick in the northern section associated with significant quantities of perched water – suspected infilled pond / reservoir.

The Phase 2 Environmental Ground Investigation concluded on the basis of 14 No. solid, 3 No. leachate, 9 No. groundwater and 3 No. surface water (Corn Brook) chemical tests for an extensive suite of determinands that the site poses a very low risk to human health and a low risk to controlled waters receptors due to the lack of pathways for the limited isolated pockets of identified contamination. The findings of the subsequent ground gas monitoring undertaken at the site indicate the use of low level round gas protection measures across the site.

The conclusions of the Geotechnical Ground Investigation Report stated that, it was recommended to utilise piled foundations onto the underlying natural firm to stiff clays. However, this is subject to detailed inspection / advice from specialist piling contractors in terms of bearing capacities and settlements. It is anticipated that a suspended floor slab cast directly onto the existing ground will be more economical, as it is anticipated that ground improvement of the made ground deposits will be required if a ground bearing slab is utilised.

The following site investigation works were obtained, with permission, from the Client:

- Area A, B, D, E and F
    - Atkins Environmental Assessment for New East Manchester – Fujitsu Main Site *(Area A, B, D and E),* Unit 1 *(off site),* Baric Pumps *(Area F)* and Car Park *(off site)* (dated June 2006)

The Atkins report subdivides the site into aforementioned sub-sections in a manner which would allow each site to be reported in isolation at a later date on an environmental basis only.

The findings of report for Area A, B, D and E indicate that the former Fujitsu site (4.6Ha) consisting of offices, warehouses and workshops with associated car parks. The site history included a chemical works and an iron works with associated features together with an infilled reservoir. The findings of the intrusive works recorded the presence of elevated concentrations of TPH (particularly C12-C16) and localised hotpots of TPH, VOCs, SVOCs, metals in the top 1.0m bgl. Associated leaching results were noted by Atkins to have low leaching potential but exceedances of PAHs, ammonium and metals were recorded along with exceedances of a range of PAHs, VOCs including BTEXs and inorganics / metals within the groundwater sampled. Atkins concludes that further assessment work is undertaken to determine the risk to Corn Brook, the underlying aquifer and human health receptors.

With respect to Area F, Atkins state the 1.5 Ha site was occupied by Baric Pumps / Armstrong Holden Brook Pullen for the design and production facility for circulating pumps, pressurisation units, booster sets and hot water generation packs. A tank (unknown contents) and car parking wee observed on site. Historically, Atkins state that the site was used for numerous uses including bleach and dye works, iron works, gas stoves and meter works with associated chimneys, a tank and a sub-station had occurred. Furthermore, alteration of Corn Brook was also noted.

No site investigation was deemed possible on site.

- Area F (Former Armstrong Pumps Site):
    - Curtins Consulting Ltd Phase 1 Detailed Desk Top Study (dated February 2015).
    - Curtins Consulting Ltd Phase 2 Intrusive Investigation (dated June 2015).
    - Capital Programmes and Property Asbestos Group – Final demolition asbestos survey group (dated 22nd May 2015).

For the sake of duplicating information from the above Curtins Phase 1 Detailed Desk Top Study information certain items including geology, history, etc have not been included within this review. The qualitative risk assessment undertaken by Curtins an overall negligible to moderate level of risk of contaminants to the development was present. With respect to the end user Curtins stated that the risk from UXOs and ground gases was high.

Curtins recommended obtaining a Detailed UXO Risk Assessment report prior to intrusive works and that intrusive works were undertaken for the purposes of environmental and geotechnical assessment.

Following this Curtins Phase 1 Desk Study report, site investigation works were undertaken in tow stages due to site constraints between March and May 2015 consisting of 10 No. window samples boreholes and 6 No. light cable percussive boreholes and detailed within the aforementioned Curtins Phase 2 Intrusive Investigation report. The exploratory holes recorded the following ground conditions:

- MADE GROUND consisting of gravel and sand with varying content of brick, limestone, sandstone, macadam, clinker and rare wood to depths between 1.4m and 4.8m below ground level – with deeper made ground located in the northern site section. Underlain by;
- Firm, stiff and very stiff, brown, sandy, gravelly CLAY, gravels are of mudstone and sandstone to a depth of between 6.5m and 9.0m below ground level. Underlain by;
- Weathered MUDSTONE (encountered in 6 No. boreholes).

With the exception of 2 No. window samples in central and northern section of the site no groundwater was encountered across the site.

19 no. chemical tests were undertaken and recorded exceedances in relation to a commercial end use for human health of widespread sulphate and detection / 0.001% asbestos (Chrysotile and Amosite) and isolated pockets of PAHs.

Curtins concluded that there was, based upon a commercial end use, a moderate risk to human health and a low risk to groundwater receptors. Despite the elevated PAHs recorded within the perched water and constraints in the form of sampling / or representative sampling of Corn Brook the cost benefit of any remedial works was deemed inappropriate.

On the basis of the 5 No. Curtins ground gas monitoring visits to date no methane or positive flow and a maximum carbon dioxide of 7.3% v/v was recorded – which Curtins state will require utilising CIRIA 665 ground gas protection measures inline with CS2 for the proposed development.

In terms of concrete classification, Curtins state that DS-3 should be adopted with an ACEC class of AC-4. Furthermore, Curtins state that the use of ‘barrier pipe’ (PE-Al-PE) will be required given the hydrocarbon concentrations recorded.

The following remedial options were suggested by Curtins:

- The provision of an adequate depth of clean and inert cover in soft landscaped areas
- The provision of gas protection measures achieving a Comparative Risk Score of 2 in accordance with BS8485.
- The delineation of asbestos impacted soils in and around WS03 and relocation on site at a minimum of 2m depth.
- The management, excavation, movement and any disposal of soils containing asbestos is to be undertaken and supervised in accordance with a method statement compiled by a specialist asbestos contractor.
- Measures required to make safe the excavation, movement and if required the disposal of soils potentially containing asbestos fibres will

also address the issues from the generation of airborne dust from the made-ground soils containing PAH's.

- The provision of adequate PPE and sanitary facilities
- The provision of intrinsically safe gas monitoring for excavation and other sub surface works where gas concentrations and volumes could build up.

Curtins states that in terms of Waste Classification the majority of the soil are Non-Hazardous waste, although pockets of hazardous waste was encountered in WS3, WS05, WS08 and WS09 and WS09 – further work is required to classify the site materials.

Curtins have reviewed the site investigation works and recommended the following foundation options for the support of structural loads include the following:

- Pad foundations generally to the south onto the natural clay (not soft) with allowable bearing capacities of approximately 150kN/m$^2$.
- Piled foundations generally to the north

Where the natural clay is at shallow depth, Curtins indicate that a ground bearing floor slab maybe considered and where deeper made ground is present, floor slabs bearing on the foundations by a network of beams will minimise any differential settlement between the floor and the main structure.

The Capital Programmes and Property Asbestos Group asbestos survey was reviewed and the location and type of asbestos and consequence requirement for removal was noted.

## 6.7 Hydrology and Hydrogeology

Environmental data relevant to the site and its immediately surrounding area has been obtained from sources available in the public domain. In addition, an environmental report was obtained from Landmark, the commercial suppliers of environmental data. The Landmark report and associated maps that have been inspected are presented in Appendices 4 and 5, and the principal observations in relation to waters and flooding can be summarised as follows:

Flooding

- The site is located within an area designated as Flood Zone 2 and 3, an area that is classified as at risk from flooding from river or sea flood events.

Surface Water

- The nearest surface water feature is Corn Brook, a GQA Grade C River which flows east to west through a culvert beneath the site. A section is exposed on Area F. The brook historically flowed along its original path until the early part of the Twentieth Century when it was partially culverted beneath Areas C and D and was subsequently culverted beneath Area F in the 1920s.
- There are no water abstraction points under 1km of the site.
- There are 11 No. surface water abstraction points under 2km of the site from Ashton Canal and River Medlock associated with dust suppression, cooling, drinking and other industrial processes.

For further details please see the Envirocheck datasheet attached in Appendix 5.

Hydrogeology

- The site is underlain by bedrock which is classed as a Secondary A aquifer overlain by low permeability superficial drift deposits of high leaching potential designated as unproductive strata.
- There are 4 No. discharge consents within close proximity to the site (4-14m from site) associated with storm sewerage overflow discharge into Corn Brook by United Utilities. The consents span from January 1995 to present.
- There are 6 No. groundwater abstraction points under 1km of the site from various locations associated with manufacturing and mineral products.
- There are 21 No. groundwater abstraction points within 2km. These abstraction points relate to irrigation, manufacturing processes, dust suppression, etc. at locations such as Belle Vue Leisure Centre, Manchester City Football Club, etc.
- There are 7 No. local authority pollution prevention and controls within 250m of the site. These relate mainly to air pollution control associated with industrial processes in close proximity to the site.
- The site is not located within a Source Protection Zone.

Pollution Incidents to Controlled Waters

There are 5 No. recorded pollution incidents to controlled waters within 500m of the site. All of the following relate to category 3 (minor incidents) associated with Corn Brook:

- 285m north in 1997 relating to run-off of pollutants used to extinguish a fire;
- 344m east in 1995 relating to the disposal of organic wastes;
- 411m east in 1996 relating to the disposal of oil;
- 414m south-east in 1992 relating to the a spillage of an unknown pollutant;
- 491m east in 1993 relating to the discharge of industrial effluent.

## 6.8 Hazardous Installations, Landfill and Waste

The following information relating to hazardous installations, landfill and waste obtained from the Landmark report, published information and the walkover survey can be summarised as follows:

- There is a single historical landfill site within 500m of the site located 483m to the east. The last input date was December 1994.
- A licensed waste management facility operated by Hope Cement Limited abuts the site to the north-east. The license was issued in April 2012 and modified in December 2012.
- There are 12 No. further licensed waste management facilities located within 500m of the site relating to the recycling of metals, management of end of life vehicles, household / commercial / industrial waste transfer stations, and the like.
- There are no waste EP OPRA sites on or near the site.

## 6.9 Radon

The Indicative Atlas of Radon in England and Wales produced by the Health Protection Agency and British Geological Survey indicates that the site lies in an area where 1% to 3% of homes are above the action level.

BRE211 ‘Guidance on Protective Measures for New Buildings’ indicates the site to be in an area where no radon protection measures are required.

Map 17 of the Indicative Atlas of Radon in England and Wales and Map 17 of BRE 211 ‘Guidance on Protective Measures for New Buildings’ contains information on the region in which the site is located and are presented in Appendix 8.

## 6.10 Unexploded Ordnance

Although the assessment of UXOs in terms of the proposed development is outside the scope of works, a Preliminary Unexploded Ordnance (UXO) Risk Assessment report (reference: P4848) by 6 Alpha was obtained for health and safety purposes.

In the report, 6 Alpha state there are no recorded bomb strikes within the site boundary however 9 No. High Explosive (HE) bombs strikes were identified within 1000m and 5 No. Incendiary Bombs (IB) were located within 355m of the site. Alpha 6 state that various works and factories on-site and in the immediate vicinity of the site may have been considered secondary bombing targets. In addition, a WWI munitions factory was identified and potential bomb damage was recorded on-site and within the immediate vicinity during WWII.

The site is designated by Alpha 6 a UXO Probability Assessment of 4, indicating a medium to high possibility of UXO encounter.

In line with the recommendations of the above report, a Detailed UXO Threat & Risk Assessment (reference P4877) was obtained from 6 Alpha. This report expands upon the above points and provides recommendations pertaining to groundworks, including safety and awareness briefings, AOD banksman support for site investigation and intrusive, downhole magnetometer surveys prior to installation of foundations.

Both reports are attached in Appendix 9 for further details.

# 7.0 CONCLUSIONS

## 7.1 General

At the time of the earliest historic (1848) mapping, the site was prominently open land with a bleach works located in the central section of the site and two chemical works abutting to the west and east of the site. By late 19th Century and throughout the early 20th Century, the site and abutting land to the north was subject to industrial development which saw several works including chemical and iron works operate on-site. During WWI the iron works factory was recorded to have been utilised for munitions construction and storage. Suspected damage during WWII is evidenced by ruins in Area F. Mid to late 20th Century saw the closure and demolition of the iron works which had expanded throughout the Century. Further development in the 1980s saw the construction of buildings of unknown use which present until recently. The large works in Area A has been refurbished and the works building in Area C has been demolished.

The path of Corn Brook was straightened between 1849 and 1893, culverted across Area C by the 1920s and finally culverted beneath Area F by 1938.

Off-site history consisted largely of numerous residential developments to the south and industrial developments consisting of various works, depots, a railway track, etc. from the early 1900s to the west, north and east.

### 7.1.1 Services / UXOs

Due to the historical highly industrial nature of the site it is recommended that prior to any site investigation works and / or construction activities that full service information is obtained from the relevant bodies and that consideration is given to undertaking a GPR survey to assist in identified the known and potential unrecorded services (e.g. private). Furthermore, given the identified risk of UXOs across the site together with the potential unknown elements e.g. buildings ruins noted on historical maps in 1948, it is recommended that prior to any works that consultation is sought with a suitability qualified UXO specialist to determine the risk and requirement depending on the nature of any intrusive activities. Finally, as a by product of the GPR survey this may indicate the presence of any subsurface geological abnormals i.e. basement / culvert walls and / or voids – depending on the requested specification.

## 7.2 Geology / Geotechnical

The desk study works undertaken indicates that the site is likely to be underlain by made ground of varying thicknesses of up to 5m with the most significant deposits of made ground expected associated with the envelopes of the former onsite reservoirs (Area A and C), infilled surface water channel – Corn Brook (Area C, D and F), significant industrial activities i.e. infilled pits, chimney bases (site wide) and terraced house basements (Area B), earthwork movements – creating cutting for Corn Brook (Area F – hence the previously deeper recorded made ground in northern section of site) etc together with unknown sub-surface features associated with the heavily industrial nature of the site. The existing tower block located in Area B is anticipated to be subject to significant sub-surface features including deep foundations and a potential basement. The presence of existing and / or infilled basements associated with the previous site use(s) is expected.

The made ground recorded across the previous site investigation works typically consists of granular materials i.e. sand and gravel with highly variable constituents of clay, glass, timber, metal, plastic, concrete, brick etc. and on occasion organic deposits.

These made ground deposits are noted by the desk study information and previous site investigation works to be underlain by glacial till (boulder clay) consisting of typically stiff, brown, slightly gravelly, slightly sandy, silty clay to a depth of between 6m and 10m bgl. This is in turn underlain by bedrock typically consisting of subordinate beds of strong sandstone or weathered mudstone of the Halesowen Formation with occasional limestone bands.

As noted on the BGS geological map for the area, the Great Mine Limestone subcrops beneath Areas B, D and on the E/F boundary (dipping approximately 18° south west) and is recorded at approximately 35m bgl (25m into rock sequence) by a historic BGS borehole approximately on the western section of the boundary between Area D and E. Further limestone and fireclay seams were noted below this shallowest seam within the BGS borehole.

Although the Coal Authority abandonment plan only noted workings to the north west of the site, due to the potential for unrecorded workings prior to the mandatory requirement to maintain and submit abandonment plans, the potential for the limestone / fireclay to have been mined either from surface (10m bgl) or via deep mining cannot be ruled out. Consequently, it is recommended that intrusive and / or non-intrusive investigation of this is undertaken across the envelope of Areas C-F but with initial focus across the subcrop position and surrounding area to determine its locality.

On the basis of the proposed development, noted in Appendix 11, it is proposed that staged site investigation works are undertaken to determine the geotechnical properties of the underlying ground conditions to bedrock should be undertaken across Areas B, D, E and F to inform proposed foundation, slab, external, earthworks and external design.

The site investigation works should also assist in identifying the presence of obstructions across the site, however this will be limited and only provide an indication in specific locations.

It is also recommended that based upon the culverted nature of Corn Brook across the site that this is accurately positioned and its condition is appraised by the appropriate person(s) to inform the proposed design works.

Details of the recommended site investigation works are contained within Section 7.9.

## 7.3 Contaminated Land Legislative Framework

On the basis of the Brief, noted in Section 2.0, an assessment of the associated contaminated land conditions for Area B and D have been undertaken as per the Clients requirements.

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 – known as the Contaminant Linkage. 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 contaminations. 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 but 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.

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]

Generic Quantitative Risk Assessment (GQRA) will utilise generic assessment criteria (GAC) for the purposes of screening allowable concentrations in 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) via measured solid concentrations
- The water environment (e.g. groundwater and surface water) via measured leachate / water concentrations

Additional receptors may be relevant dependant on the site e.g. flora/fauna, water supply pipes, buried concrete.

The GAC adopted for assessment of soils in relation to Human Health are based on published Soil Guideline Values (SGV) in 2009 for those compounds for which published criteria are available for varying scenarios (residential, commercial, allotment). In the absence of SGVs the following GAC defining documents are adopted - LQM/CIEH S4ULs (2015), CL:AIRE Soil GAC for Human Health Assessment (2010) and Category 4 Screening Levels (C4SL's) (2014).

GACs 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. GACs utilised include - The River Basin Districts Typology, Standards and Groundwater threshold values (Water Framework Directive) (England and Wales) Directions 2009 (Part 7:Groundwater Threshold Values), UK Drinking Water Standards (2000), Environmental Quality Standards, World Health Organisation concentrations, Environment Agency guidance concentrations and United States Environmental Protection Agency – Region 9 GACs.

## 7.4 Sources of Contamination and Probable Contaminants

On the basis of the reviewed information the following potential contaminative sources have been identified:

Area B

| Source ID | Potential Contaminative Activity and Date | Associated Determinands | Comments |
|---|---|---|---|
| 1 | Made Ground – reworked materials / unknown imported | Suite 1 | Given the site history is principally terraced housing (west and central) and iron works in eastern section and the legacy of industrial activities prior to the mid 20th Century the potential for significant contaminants (non-volatile) is high if unknown in their nature. Consequently, an extensive suite of determinands is deemed appropriate. |
| 2 | Iron Works | Suite 2 | Associated products iron ore, coke, pellets and limestone. Wastes products include blast furnace slag, dry dust, wet solid and refractory waste – producing a slag. |
| 3 | Terraced housing | Asbestos | Associated with demolition materials – suspected backfilled basements and shallow made ground. |
| 4 | Off site contaminative migration | Suite 1 | Excluding importation of made ground from off site, the potential for off site sub-surface migration of contaminants (if pathway present). |

**Suite 1:** Soluble sulphate, boron, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, vanadium, zinc, nitrate, sulphide, cyanide (free and total), pH, phenols, PCBs, Total Petroleum Hydrocarbon (TPH) screen followed by speciated banded – 3 banding or full banding speciated Aliphatic and Aromatic Total Petroleum Hydrocarbon Fractions (TPHCWG) where applicable, speciated Polyaromatic Hydrocarbons (PAHs) and asbestos.

**Suite 2:** Iron, manganese, aluminium, arsenic, nickel chromium, vanadium, molybdenum, lead, zinc, tin, phosphates, sulphate, sulphur, cyanide (free and total), PAHs, phenols, TPH screen and / or speciated banded – 3 banding or full banding (TPH-CWG).

Area D

| Source ID | Potential Contaminative Activity and Date | Associated Determinands | Comments |
|---|---|---|---|
| 1 | Made Ground – reworked materials / unknown imported | Suite 1 | Given the site history is principally chemical works (19th Century) iron works (early to mid 20th Century) and electrical works / car park from mid 20th Century) the potential for significant contaminants (non-volatile) is high if unknown in their nature. Consequently, an extensive suite of determinands is deemed appropriate. |
| 2 | Iron Works plus tanks and chimney | Suite 2 | Associated products iron ore, coke, pellets and limestone. Wastes products include blast furnace slag, dry dust, wet solid and refractory waste – producing a slag.<br>Where evidence of former tank / chimney, testing of VOC, SVOCs and PCBs will be undertaken. |
| 3 | Chemical Works | Suite 1 | Given the age i.e. loss of volatile, dilution, attenuation and mobility factors and unknown use of the chemical works it is regarded prudent to tests for persistent determinands. |
| 4 | Off site contaminative migration | Suite 1 | Excluding importation of made ground from off site, the potential for off site sub-surface migration of contaminants (if pathway present). |

**Suite 1:** Soluble sulphate, boron, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, vanadium, zinc, nitrate, sulphide, cyanide (free and total), pH, phenols, PCBs, Total Petroleum Hydrocarbon (TPH) screen followed by speciated banded – 3 banding or full banding speciated Aliphatic and Aromatic Total Petroleum Hydrocarbon Fractions (TPHCWG) where applicable, speciated Polyaromatic Hydrocarbons (PAHs) and asbestos.

**Suite 2:** Iron, manganese, aluminium, arsenic, nickel chromium, vanadium, molybdenum, lead, zinc, tin, phosphates, sulphate, sulphur, cyanide (free and total), PAHs, phenols, TPH screen and / or speciated banded – 3 banding or full banding (TPH-CWG).

Where evidence of hydrocarbon contamination is recorded on site – if deemed suitable, tested for TPH-CWG, SVOCs and VOCs.

Leachate and liquid chemical testing suites will be determined on the basis of the initial solid chemical testing but are anticipated to reflect these to allow the contaminant linkage to be understood along with insitu testing (waters) including pH, redox, temperature and electrical conductivity (EC).

## 7.5 Conceptual Model for Human Health Risk Assessment

On the basis of the discussed Contaminant Linkage, the following assessment of the risk to human health receptors has been established for a commercial end use. It should be noted for Area D that the site is to remain as a car park. This discussed conceptual model is discussed further within the Preliminary Risk Assessment – Section 7.9.

Sources

Given the extensive redevelopments including associated re-engineering of on site materials together with the potential uncontrolled movement of materials and the principal contaminative sources on site occurring during the late 19th to mid-20th Century, it is suspected that widespread contamination across both Areas B and D maybe present. Some targeted sampling may be appropriate however e.g. former tank in Area D.

Given the age since deposition of the majority of contaminants and on the basis of the previous site investigation works undertaken across all site areas, the risk of widespread contamination is regarded as moderate.

Consequently, the principal contaminative source is regarded to relate to the made ground deposits due to the suspected uncontrolled nature of the constituents.

Pathways

The pathways along which contamination could potentially reach the targets on site during use and after completion of development works are detailed in 'Updated Technical Background to the CLEA Model' (Environment Agency 2009) but can be summarised as follows:

a) Ingestion of soil directly and indoor dust *
b) Inhalation of soil dust (indoor and outdoor)
c) Dermal contact with soil (indoor and outdoor)
d) Inhalation of soil vapours (indoor and outdoor) – *only exposure pathway applicable to end user in hardstanding areas.*
e) Oral background
f) Inhalation background

** Treated as one pathway*

Receptors

a) End users
b) Construction workers
c) The general public

| Sources of Contamination | Pathway | Receptor | Risk |
|---|---|---|---|
| Made Ground deposits associated with industrial site legacy | Ingestion of soil directly and indoor dust *<br>Inhalation of soil dust (indoor and outdoor)<br>Dermal contact with soil (indoor and outdoor)<br>Inhalation of soil vapours (indoor and outdoor)<br>Oral background | Construction workers | MODERATE RISK |
| Iron Works and associated tanks / chimney | | | LOW – MODERATE RISK |
| Chemical Works | | | LOW – MODERATE RISK |

*End users and general public are regarded as very low / low risk.*

## 7.6 Conceptual Model for Ground Gas Risk Assessment

Due to the existing and proposed nature of Area D as a car park – no ground gas risk assessment is deemed necessary.

A conceptual model in the form of a linkage table for the purposes of a preliminary risk assessment for ground gas has been produced as a result of the probable contaminants, pathways and targets identified above as follows for Area D:

| Source | Ground Gas | Pathways | Receptors | Risk |
|---|---|---|---|---|
| On site Made Ground including potential localised off site organic materials / river deposits | Methane<br>Carbon dioxide and<br>Hydrogen Sulphide | Ingress and accumulation<br>Migration, ingress and accumulation<br>Inhalation of vapours | Human occupants<br>Building and Structures<br>Site Workers | Low |

** Pathways - limited due to presence of low permeability glacial till deposits (clay) across the site.*

As discussed in Section 6.6, ground gas monitoring was conducted for the abutting areas as part of the previous site investigation for the land abutting the site to the north west. Based on the results the report concluded that the site was within Characteristic Situation 1 (CS1 / 2) of BS8485 (2015), which is deemed to be low risk.

Utilising the guidance stipulated in BS8485 (2015), the probability and consequence of the identified potential ground gas sources at the development is considered to result in a low level of risk. Consequently, it is considered prudent to either:

- Undertake ground gas monitoring for a period of 2 months or;
- Following the observations of the site investigation, it may be considered more appropriate to assess the risk posed by potential ground gas using the approach for low risk sites specified in CL:AIRE Research Bulletin 17 (2012) and adopted within BS8485 (2015).

## 7.7 Conceptual Model For Waters Risk Assessment

On the basis of the discussed Contaminant Linkage the following assessment of the risk to controlled waters receptors has been established. This discussed conceptual model is discussed further within the Preliminary Risk Assessment – Section 7.8.

Sources

As discussed within Section 7.5, the principal contaminative source is regarded to relate to the made ground deposits due to the suspected uncontrolled nature of the potentially contaminative constituents.

Pathways

- Drainage routes and / or service trenches – into Corn Brook and / or underlying bedrock Secondary A Aquifer.
- Migration through shallow workings potentially associated with the Great Mine Limestone.
- Vertical migration is impeded by the anticipated impermeable nature of the superficial strata (glacial till / boulder clay) and the overlying hardstanding nature of existing and proposed development – however due to the historical site uses potential vertical migration pathways maybe present.
- Lateral migration is impeded due to the absence of shallow groundwater regime.

The risk of pollution to watercourses and aquifers is therefore considered insignificant.

Receptors

- Groundwater contained within bedrock as Secondary A Aquifer in excess of 10m bgl overlain by unproductive superficial deposits (glacial till).
- Surface water features – Corn Brook.

Proposed Development

The proposed site development will reduce the risk to the underlying aquifer due to an increase in the hard standing covering the site area which will reduce infiltration from rainfall.

A site conceptual model in the form of a linkage table for the purposes of a preliminary risk assessment for pollution of waters has been produced as a result of the probable contaminants, pathways and targets.

| Sources of Contamination | Pathway | Receptor | Risk |
|---|---|---|---|
| Made Ground deposits associated with industrial site legacy | Drainage routes and / or service trenches | Groundwater within Secondary A Aquifer<br>Corn Brook | LOW – MODERATE RISK |
| Iron Works and associated tanks / chimney | Vertical migration and Lateral migration | | LOW – MODERATE RISK |
| Chemical Works | Migration through shallow workings | | LOW – MODERATE RISK |

## 7.8 Preliminary Risk Assessment Summary

**As discussed this has only been undertaken for Areas B and D**

Human Health

On the basis of the human heath conceptual model and given the proposed development, the site is regarded to pose a low level risk to the proposed end users given the lack of exposure pathways as a by product of the principally hardstanding nature of the site. The exception to this applies to two scenarios:

- soft landscaped areas
- soil vapour

In terms of the proposed soft landscaped areas, it is deemed highly likely that potential elevated determinands maybe in existence within the shallow made ground deposits, consequently following appropriate chemical testing of the shallow made ground deposits, the requirement for further assessment (further testing or risk assessment) or remedial works e.g. clean cover system will be determined. Furthermore, given the time since deposition of the made ground deposits in relation to their potential exposure to hydrocarbons i.e. iron works, chemical works (prior to mid-20th Century) the risk posed by the soil vapour exposure pathway is regarded to be significantly reduced since this period due to the inherent volatility of the determinands, if present. However, potential for anaerobic conditions may exist in localised areas and appropriate chemical testing should be undertaken to quantify this risk.

Given the nature of the made ground deposits and the anticipated significant construction activities the risk posed to the on site construction worker is regarded to be the highest risk receptor due to the highly active nature of the works - liberating potential asbestos fibres (inhalation) with the ingestion and dermal pathway also pertinent for other relevant contaminants. However, following the proposed site investigation works it is envisaged with appropriate PPE and site management that these risks can be mitigated.

If following the findings of the required chemical testing, significant concentrations of the tested determinands are recorded then appropriate measures to mitigate the exposure pathway to the general public should be considered.

Ground Gas

Given the findings and subsequent ground gas risk assessment from previous site investigations located in close proximity to the site, it is deemed that the risk of ground gas issues is low-moderate for Area B and that following completion of the ground gas risk assessment, a passive ground gas protection system is deemed likely.

As previously noted, a ground gas risk assessment is not applicable for Area D.

Controlled Waters

Given the industrial legacy of the Areas B and D, the potential for significant concentrations of contaminants is highly likely, albeit with the highly mobile contaminants already dispersed. This is in line with the findings of the off and on site previous site investigation works which recorded isolated pockets of significant contamination consisting of widespread elevated metal and PAH concentrations within made ground deposits.

Consequently, to determine the risk to both the underlying aquifer and Corn Brook (to a lesser extent due to lack of proximity and the absence of pathways within Area B) a mixture of leachate and solid chemical testing should be undertaken from the shallow made ground deposits and the underlying natural deposits to establish whether a migration pathway is present – based upon the site investigation works to date no shallow groundwater regime exists (with exception of isolated pockets associated with former basements and infilled reservoirs), consequently the superficial deposits are suspected to be located within the unsaturated zone which will assist in retarding migration. Furthermore, the previously identified elevated determinands i.e. metals and PAHs are not regarded to be significantly mobile given the identified pH levels within the shallow and underlying deposits.

Following completion of these leachate and solid tests, the requirement to test the underlying groundwater and / or Corn Brook will be established. It should be noted that previous chemical testing of Corn Brook associated with Area C recorded no above Tier 1 screening values – so this is deemed to be unlikely.

Summary

As a result of the risks identified, a Phase 2 intrusive environmental ground investigation including contamination testing of soils and groundwater should be undertaken on the basis of this Phase 1 report. Depending on the levels of contaminants encountered on site, a Phase 3 numerical risk assessment may be required to determine the acceptable levels of contamination.

## 7.9 Scope of Phase 2 Intrusive Geo-Environmental Ground Investigation

Proposed Scope of Environmental Investigation – Area B and D

As a result of the preliminary risk assessment, a Phase 2 intrusive environmental ground investigation should be carried out to quantify the identified risks. This intrusive site investigation works should include the collection of appropriate samples – solid, leachate and if deemed necessary liquid across Area B for appropriate chemical testing as detailed in Section 7.4.

On the basis that Area D is to remain as a car park, no site investigation works for environmental purposes are deemed necessary as it will remain as its current site use. However, if this land use should alter then, utilising the above works, site investigation works based upon a proposed development plan should be undertaken.

On the basis that Area D is presently occupied by a multi storey tower block and associated low rise building and car parks, the exact nature of the intrusive works cannot be determined – it is anticipated that these will consist of a mixture of trial pits and window sample holes or similar to investigate the underlying made ground deposits associated with the previous terraced housing and iron works.

Ground gas and groundwater depth monitoring of boreholes, targeting the made ground deposits should be undertaken.

At this stage no allowance for WAC testing or waste classification has been made – following further earthworks design further chemical testing to determine this maybe required.

The chemical testing will be undertaken line with the identified chemical suites noted in Section 7.4.

Furthermore, sufficient chemical testing will be undertaken to allow understanding of the underlying ground conditions to appropriately design sub-surface service information (Water main pipelines) and concrete classification for aggressive ground.

Proposed Scope of Geotechnical Investigation – Areas B, D, E and F

- Area D

On the basis that Area D is to remain as a car park, no site investigation works for geotechnical purposes have been requested by the Client. It is understood that the presence of sub-surface voids may be present and along with the requirements noted for Area B and E, these would require investigation.

- Areas B and E

For Areas B and E due to the early nature of the development design process e.g. unknown geotechnical requirements (i.e. depths, samples recovery type, proposed levels, building loads), an absence of landowner requirements i.e. timings, reinstatement specifications etc., the exact details for intrusive works cannot be determined at this stage. However, the following issues will require attention prior to works being undertaken:

- An exhaustive list of service information should be obtained and a non-intrusive survey GPR should be undertaken to validate these plans together with identifying further private and / or unrecorded sub-surface services.
- A GPR Survey may also be able to locate basement boundaries on site. The suitability of the GPR method should be confirmed by an appropriate specialist.
- An understanding of all stakeholders requirements in terms of timings to undertake works, the reinstatement requirements e.g. grouting of boreholes, geotechnical requirements and intrusive method preference.

It is anticipated that based upon the historical information that site investigation works should be undertaken to determine the presence of ground obstructions e.g. associated with former basements and building foundations, establish the presence, thickness, constituents of any made ground and determine the depth and geotechnical properties of the underlying natural glacial till to sufficient depth.

- Area F

On the basis of the proposed development plan, the previous site investigation works undertaken by Curtins and established engineering input (in order to allow the design of the proposed foundations, externals, floor slabs, earthworks and highways to be undertaken), it is proposed that prior to demolition of the existing superstructure that trial pits works are undertaken to inspect the bulk properties of the underlying made ground deposits (thickness, constituents, approximate density, etc.) and to determine the depth and strength of the underlying glacial till deposits and potential suitability for the use of ground improvement techniques e.g. vibro compaction. Further to this it will allow an appraisal of the anticipated presence of sub-surface obstructions and their density across the site to be determined.

Following the demolition of the existing building and removal of substructure features to an unknown depth the requirements for further exploratory holes will be determined based upon the initial site investigation works, engineering input and demolition / enabling works specification e.g. mass excavation of sub-surface features.

Furthermore, on the basis of the presence of the culverted Corn Brook across the northern section of Area F it would be prudent to undertake an intrusive and / or non-intrusive survey to determine its locality, depth and integrity.

- All Areas

Prior to any site investigation works the recommendations of the Detailed UXO risk assessment together with obtaining of appropriate service information and / or GPR surveys should be considered.

On the basis of the proposed development plan, at this stage the requirement to obtain bedrock cores has not been deemed necessary and it is understood that permeability testing of soil infiltration test pits and / or falling head tests to understand the permeability of the underlying ground conditions is not required.

Geological Exploratory Hole Rationale

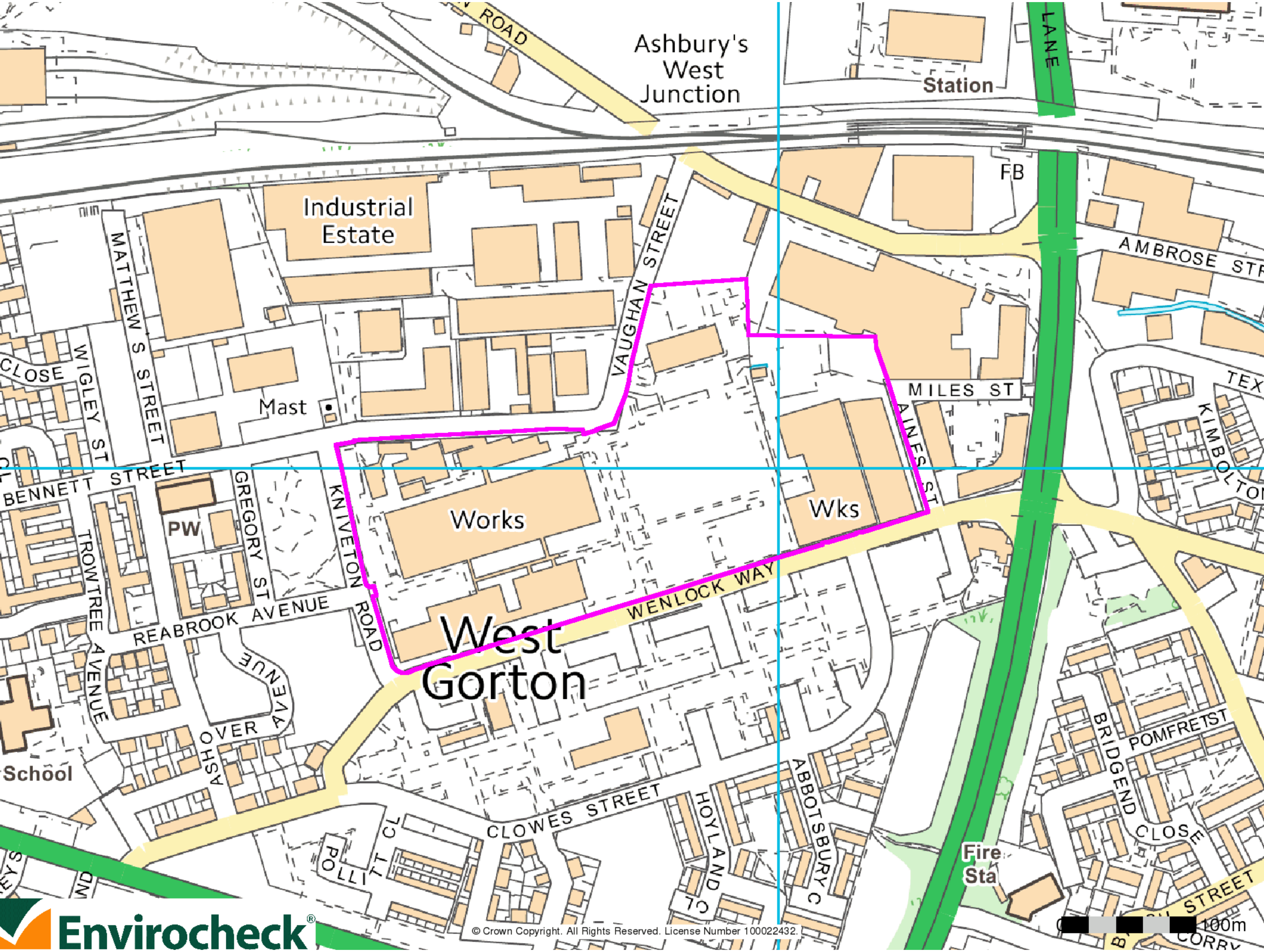
As discussed in Section 6.5.3, the risk of potential ground instability issues relating to the proposed development from previous mining and / or dissolution of the underlying limestone and fireclay deposits is possible.

Consequently, further assessment incorporating intrusive (core recovery / open hole rotary holes) and / or non-intrusive techniques should be undertaken across Areas C, D and F to determine the thickness, depth, dip and geological properties of the relevant stratum – the exact specification is subject to discussions with relevant stakeholders and Client in terms of risk requirements.

In terms of coal mining, due to the depth of the coal seams, the risk of ground instability from coal mine workings effecting the proposed development is regarded as low.

# APPENDIX 1

# SITE LOCATION PLANS, SITE SUB-SECTION PLAN AND AERIAL PHOTOGRAPH



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LANE
FB
Industrial Estate
AMBROSE STR
MATTHEW S STREET
VAUGHAN STREET
CLOSE
WIGLEY ST
Mast
MILES ST
TEX
KIMBOLTON
BENNETT STREET
PW
GREGORY ST
KNIVETON ROAD
Works
Wks
TROWTREE AVENUE
REABROOK AVENUE
WENLOCK WAY
West Gorton
AVENUE
ASHOVER
School
POMFRET ST
BRIDGEND CLOSE
CLOWES STREET
POLLITT CL
HOYLAND CL
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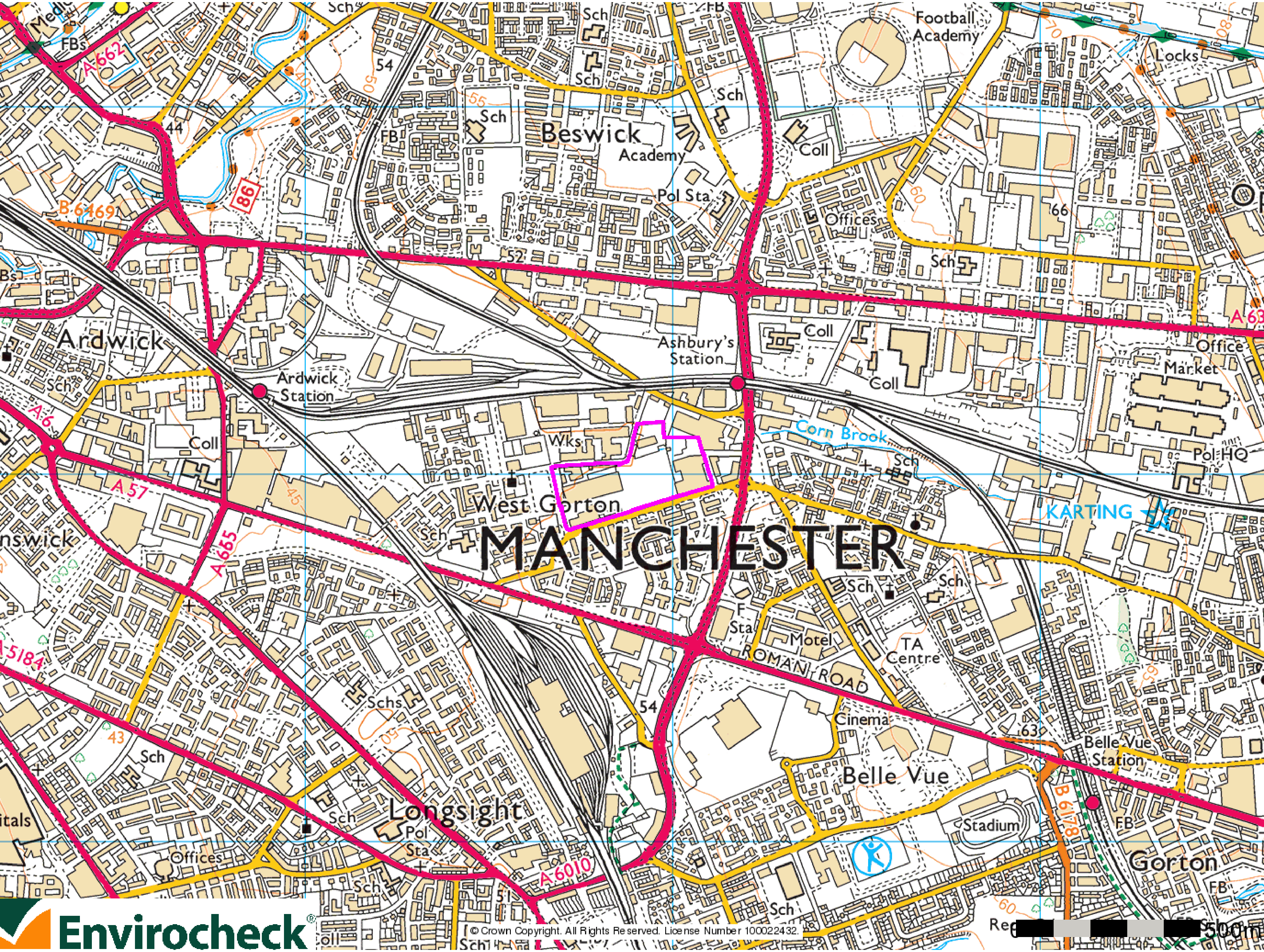

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Academy
Ardwick
Ardwick Station
Ashbury's Station
West Gorton
Wks
Longsight
Belle Vue
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Gorton
Football Academy
Locks
Corn Brook
KARTING
Market
Office
Offices
Pol HQ
Pol Sta
Coll
Sch
Schs
Motel
TA Centre
Cinema
Stadium
ROMAN ROAD
F Sta
FB
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A 57
A 6
A 665
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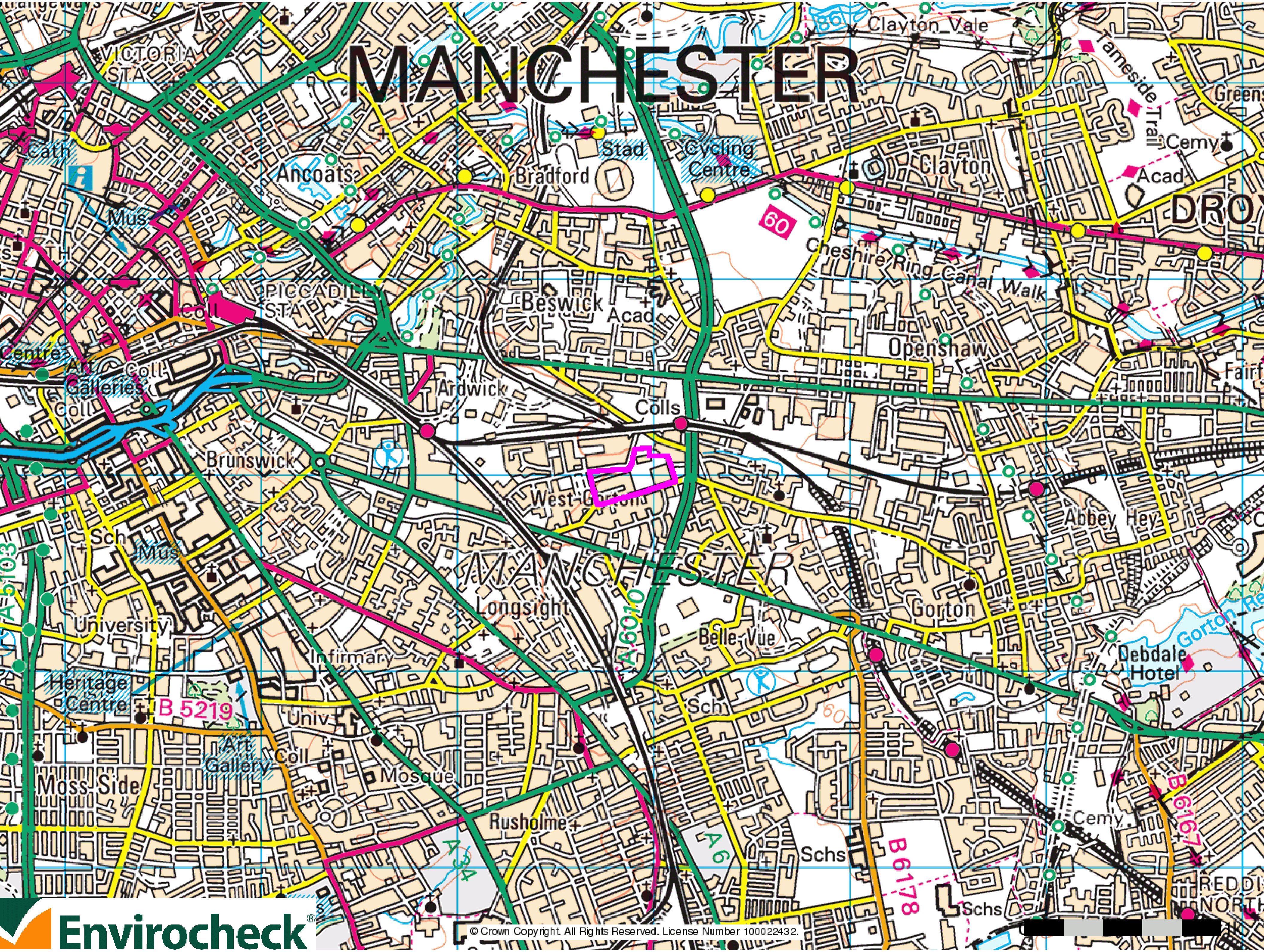
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DROY
60
Cheshire Ring Canal Walk
Piccadilly Sta
Coll
Beswick
Acad
Openshaw
Fairf
Centre
Art Galleries
Coll
Ardwick
Colls
Brunswick
West Gorton
Abbey Hey
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Mus
MANCHESTER
A 6010
A 5103
Longsight
Gorton
University
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Belle Vue
Debdale Hotel
Gorton Re
Heritage Centre
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Art Gallery
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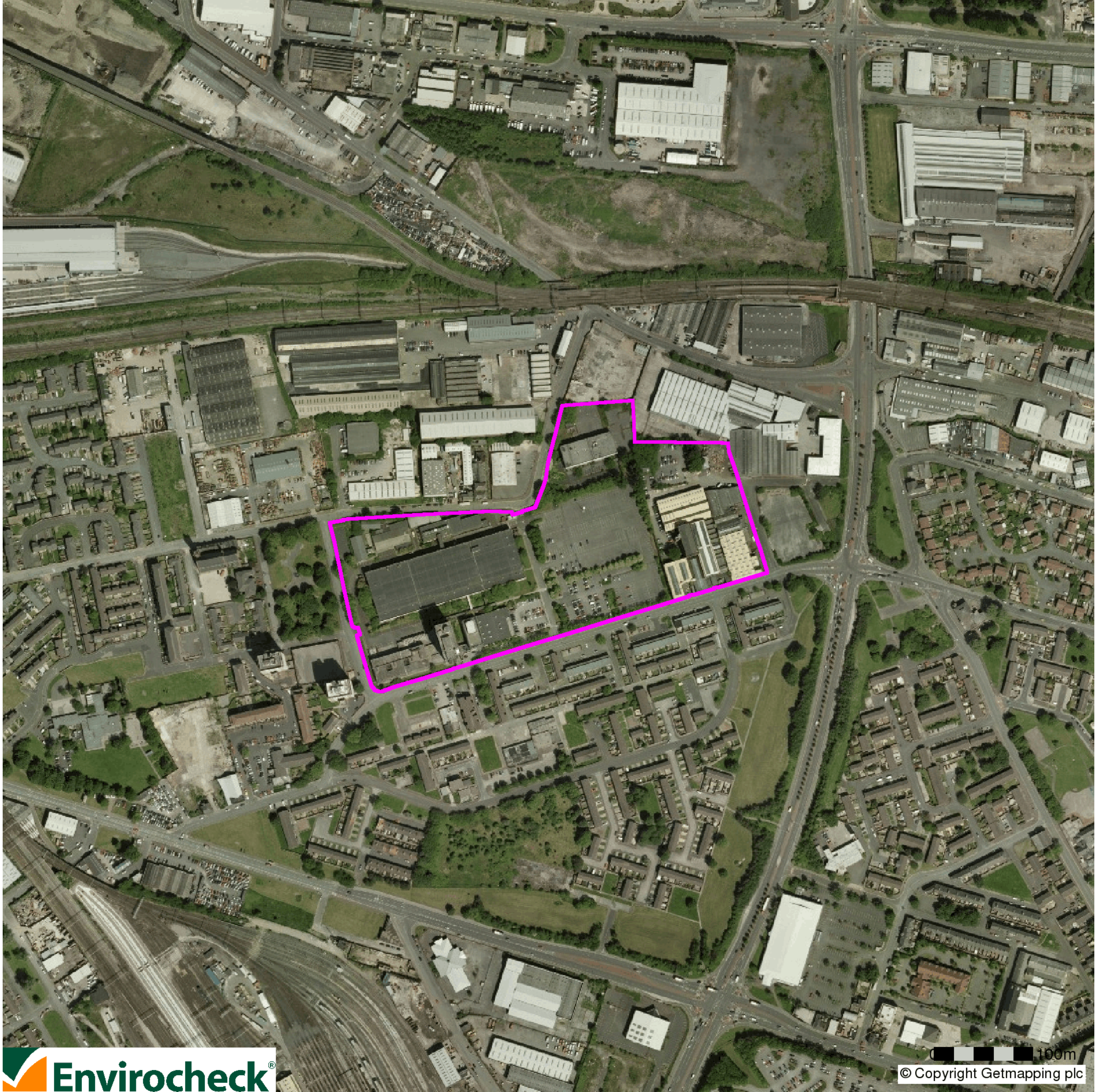

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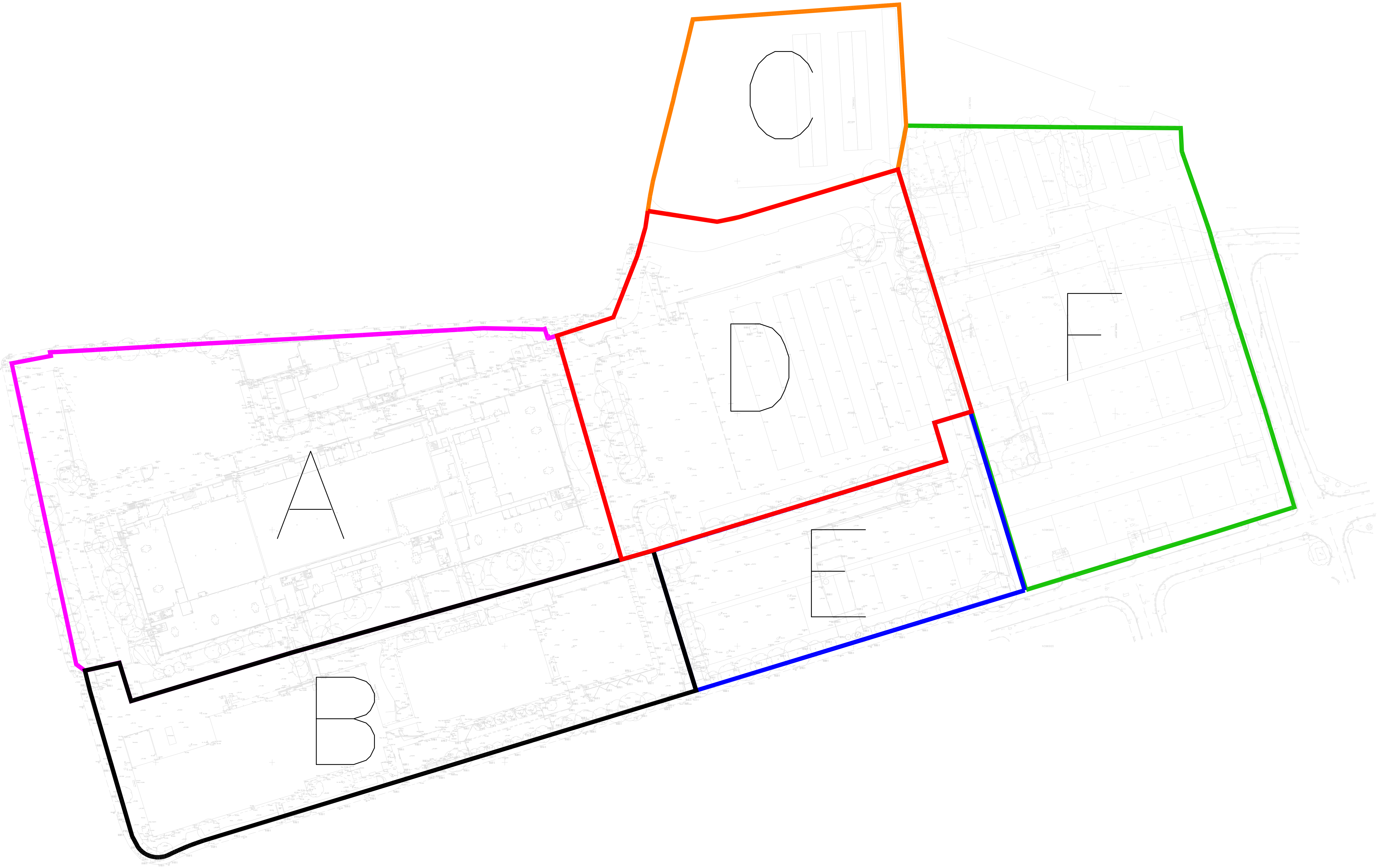

## Notes.

1 All dimensions and levels are in metres unless noted otherwise.

2 This drawing is to be read in conjunction with all relevant Architects and Service Engineers drawings.

| Rev | Drawn | Date | Description |
|---|---|---|---|

**Drawing Status**
INFORMATION

**Contract**
SPACE PROJECT, WEST GORTON, MANCHESTER

**Drawing Title**
SITE SUB–SECTION PLAN

**Integra**
**consulting**
**environmental**

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**web: www.integraconsulting.co.uk**
**tel: 0161 237 9310**

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| **Scales** 1:625@A1 | **Date** OCT 2015 |
| **Drawn** MC | **Checked** AE |
| **Contract No** 2913 | **Drawing No** SI–01 P1 |

# APPENDIX 2

## WALK OVER SURVEY PHOTOGRAPHS AND PHOTOGRAPH LOCATION PLAN

Area F

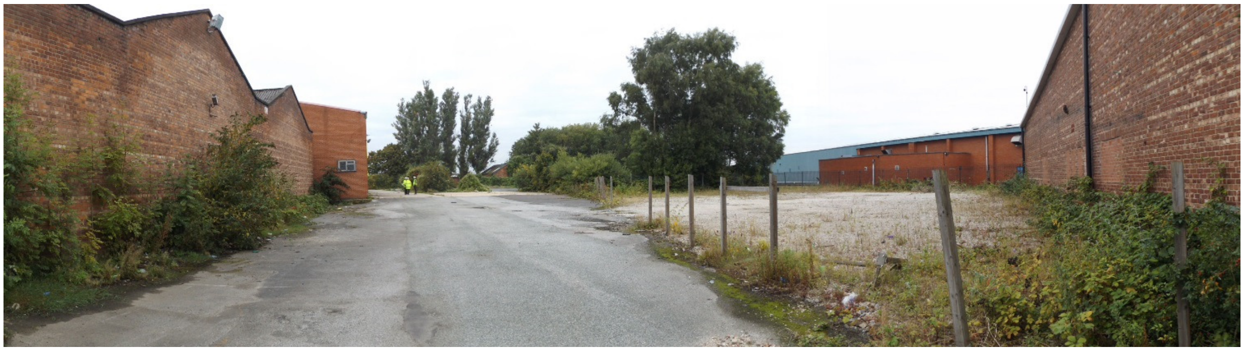


Plate 1: Panoramic view looking west of the north-eastern site section.

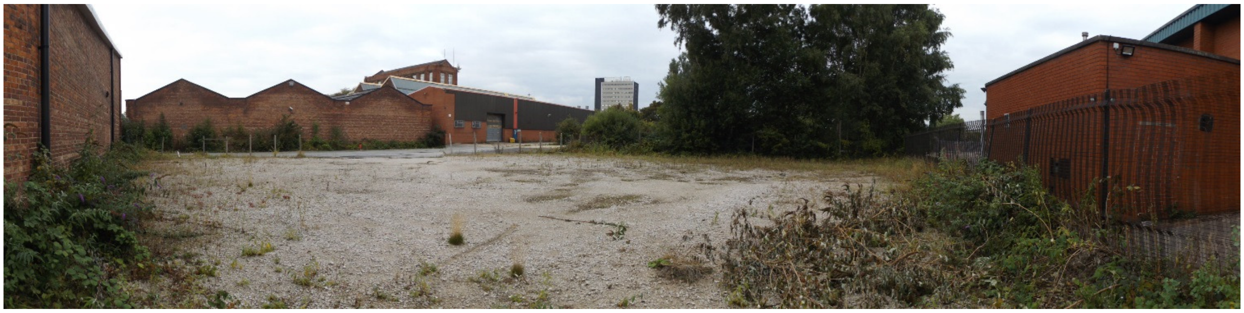


Plate 2: Panoramic view looking south-west of the north-eastern site section.

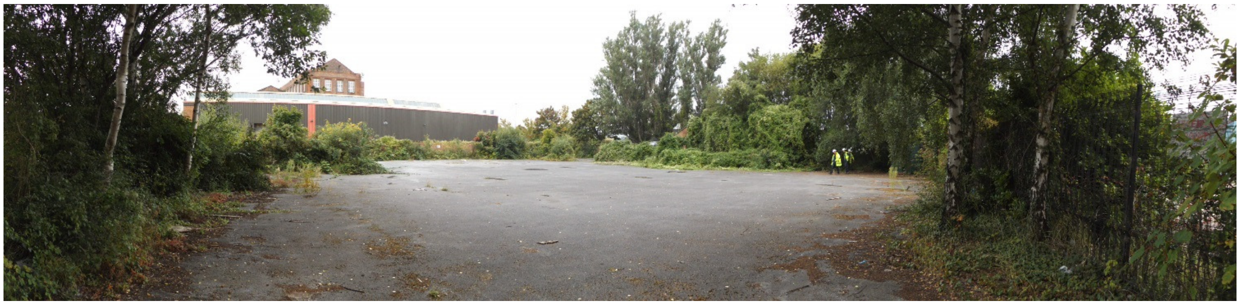


Plate 3: Panoramic view looking south of north-western site section.

Plate 4: Access to from Aines Road.

Plate 5: Derelict building in the north-western site section.

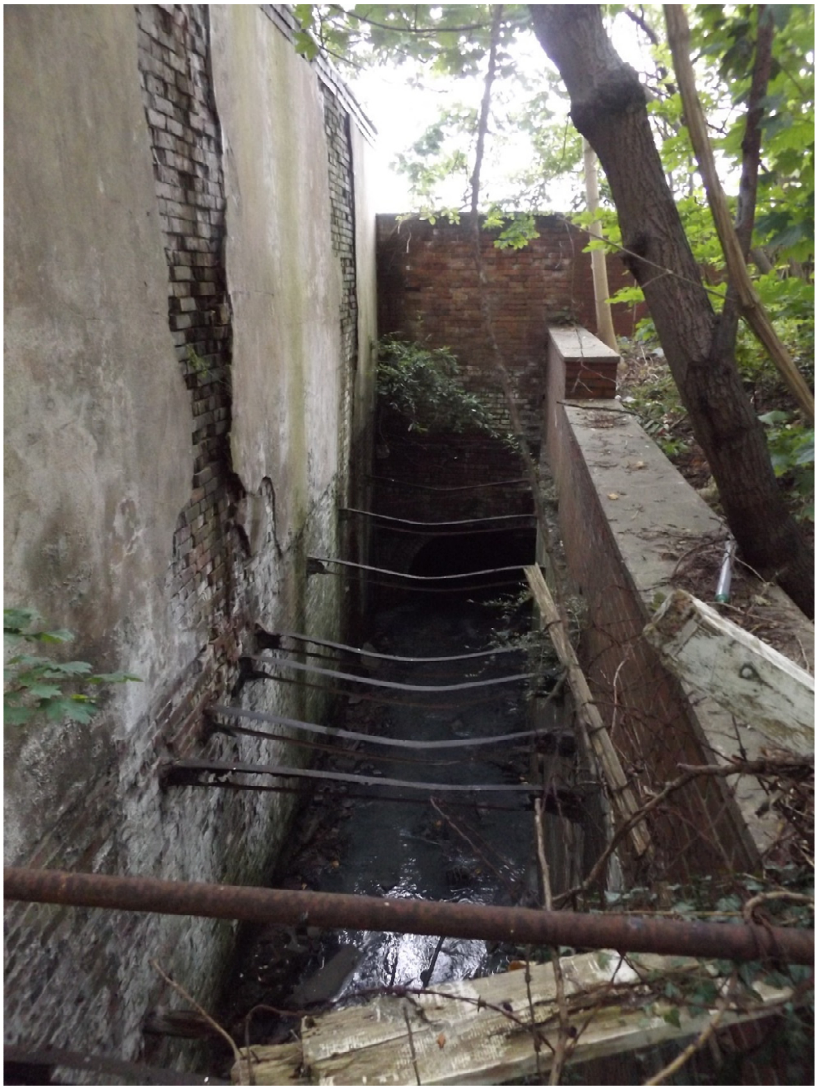
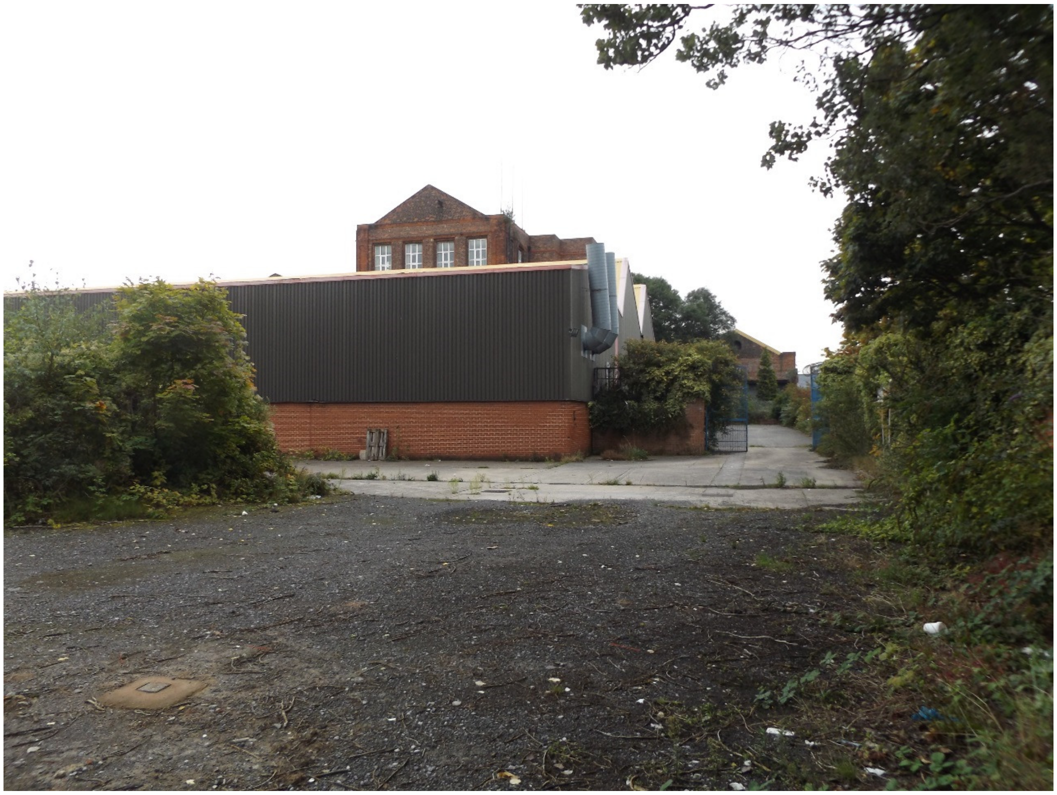


Plate 6 (left): Exposed section of Corn Brook.

Plate 7 (below): Looking south at the existing building.



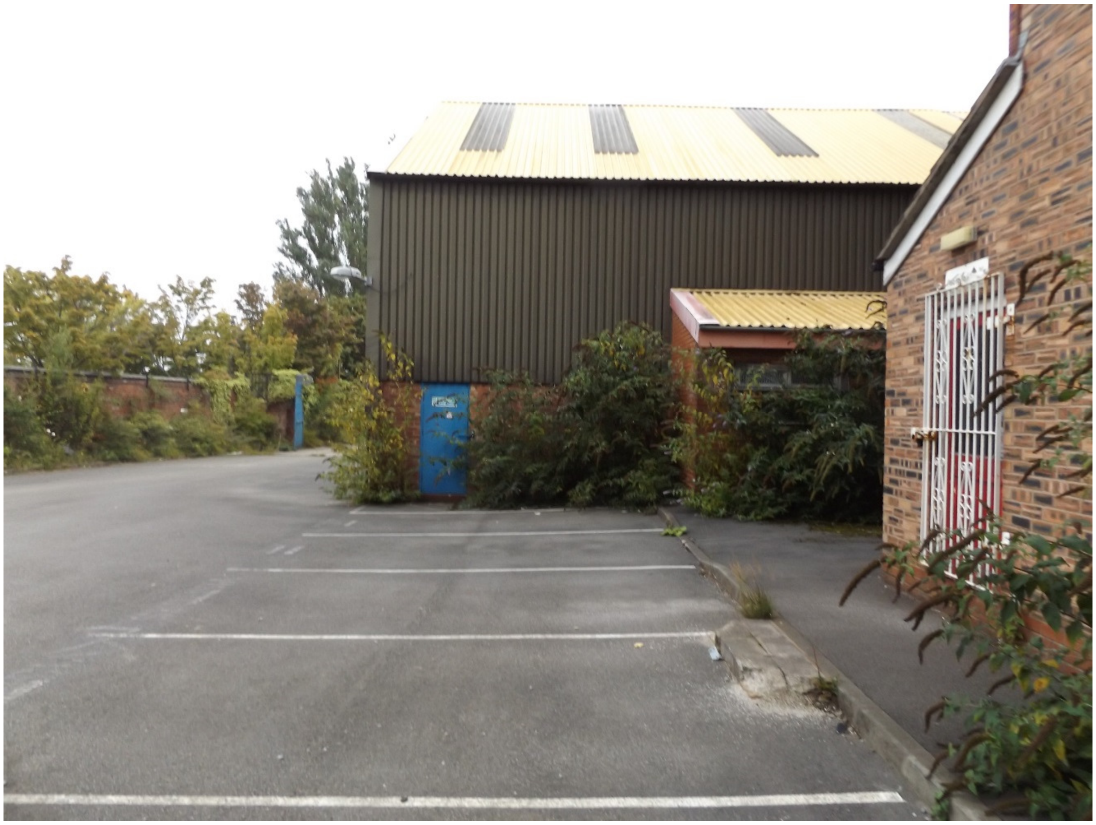


Plate 8: Looking north from the western site section.

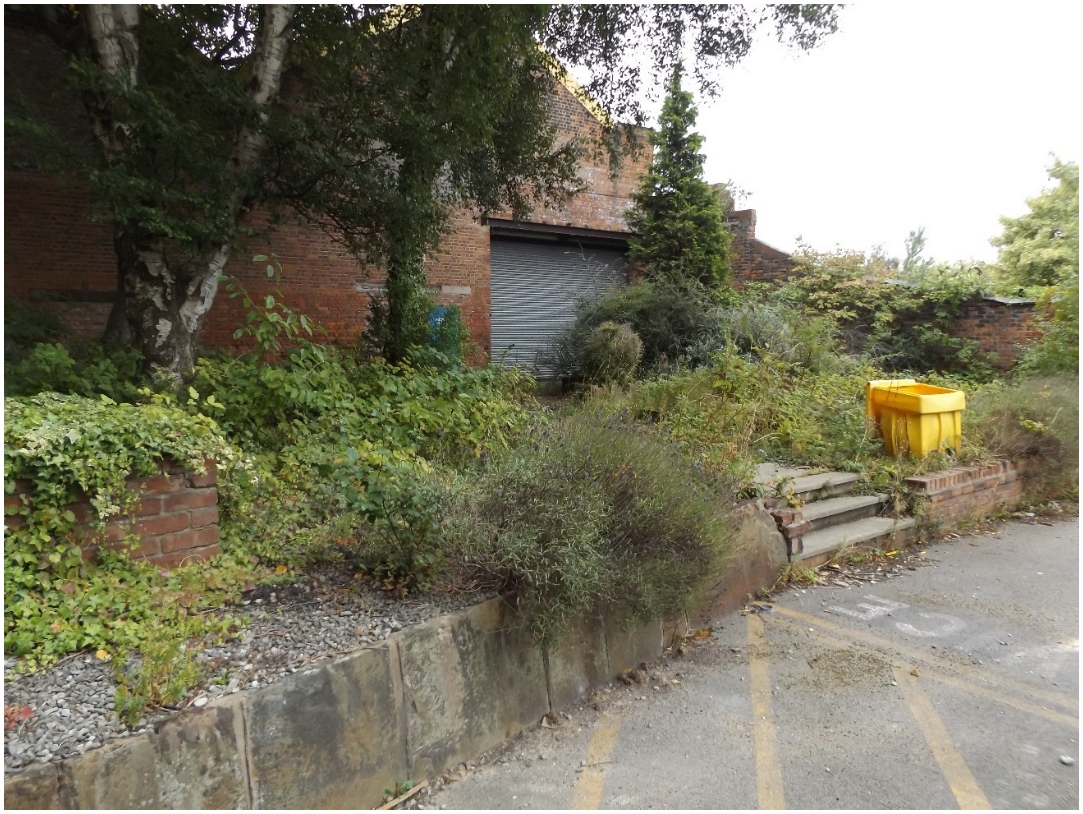


Plate 9: Small area of soft landscaping in the western site section. Potential access to the building if mechanism is repaired.

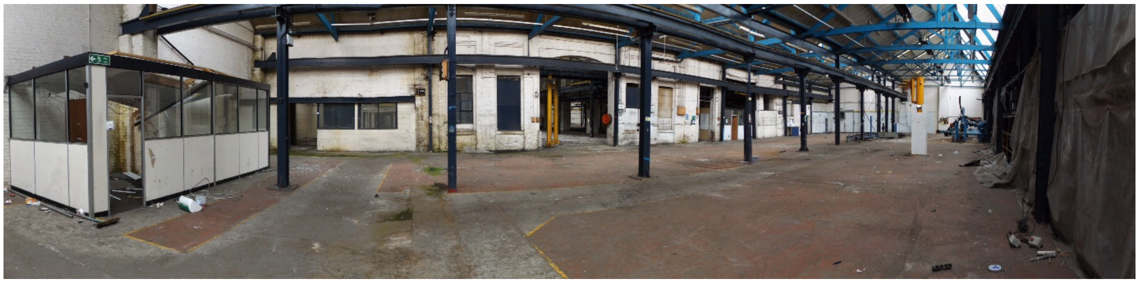


Plate 10: Looking south from within factory building.

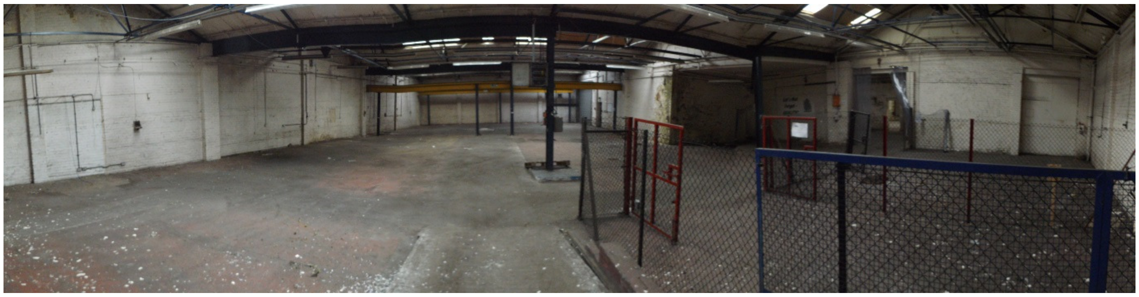


Plate 11: Looking east from within the north-western most section of the building.

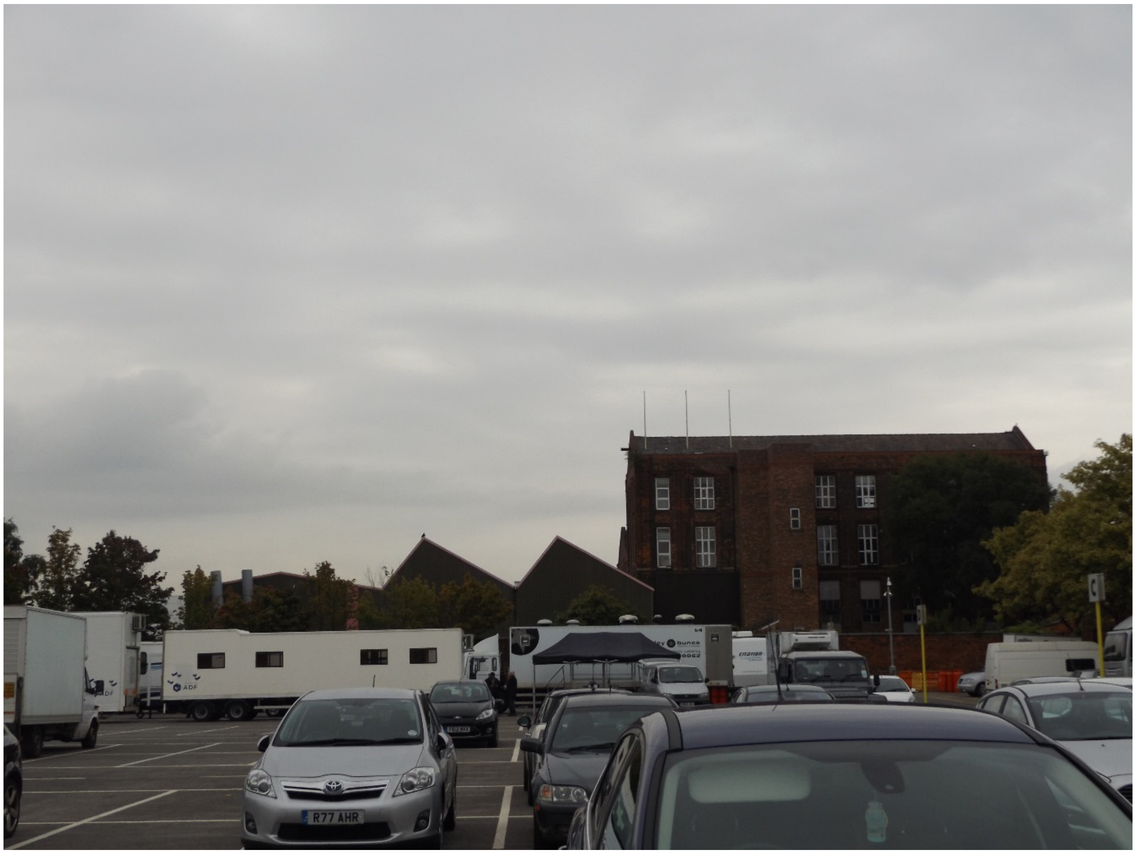


Plate 12: Looking east from Area D at the factory building.

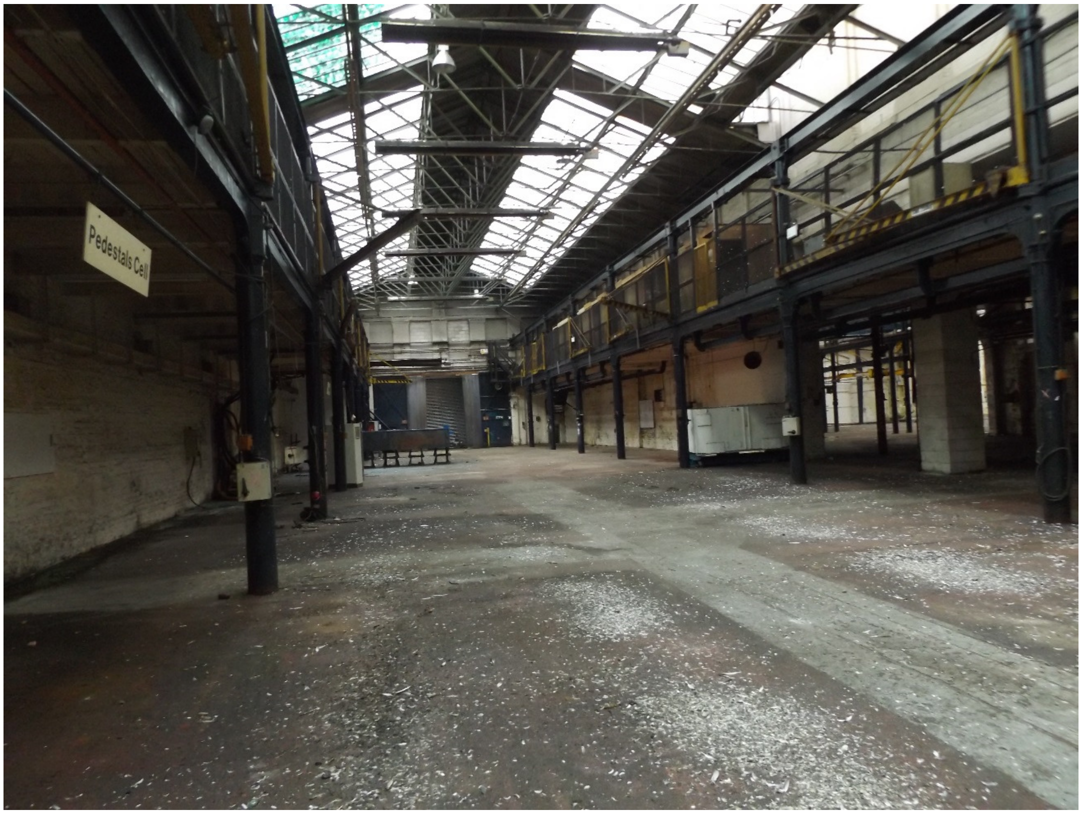

Pedestals Cell

Plate 13: Looking south from within the main section of the factory building.

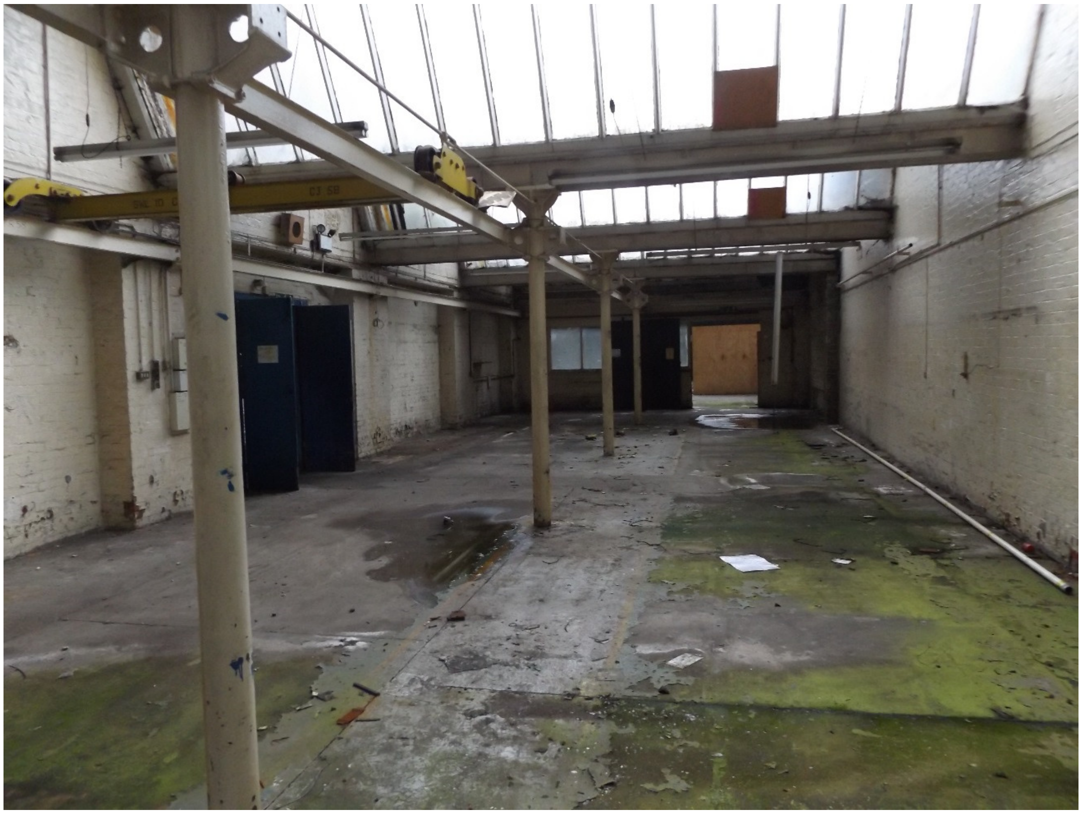


Plate 14: Looking south within factory building.

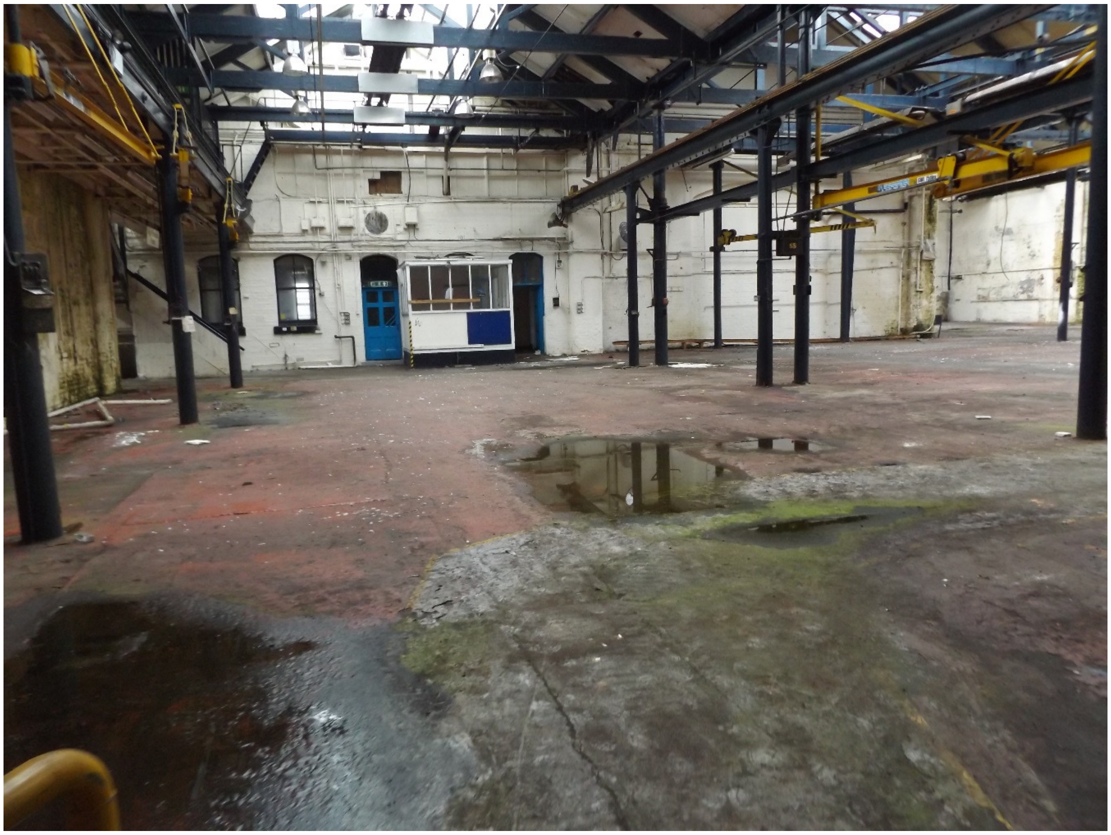


Plate 15: Looking south.

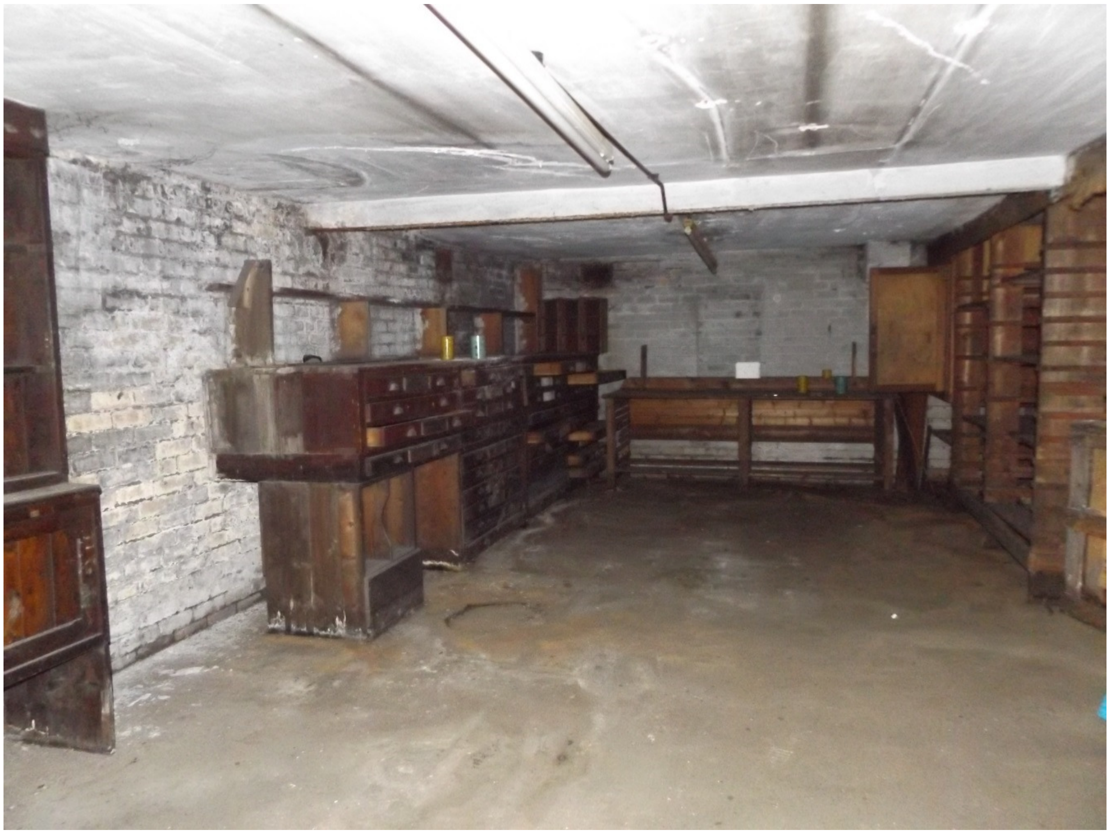


Plate 16: Basement on southern site boundary.

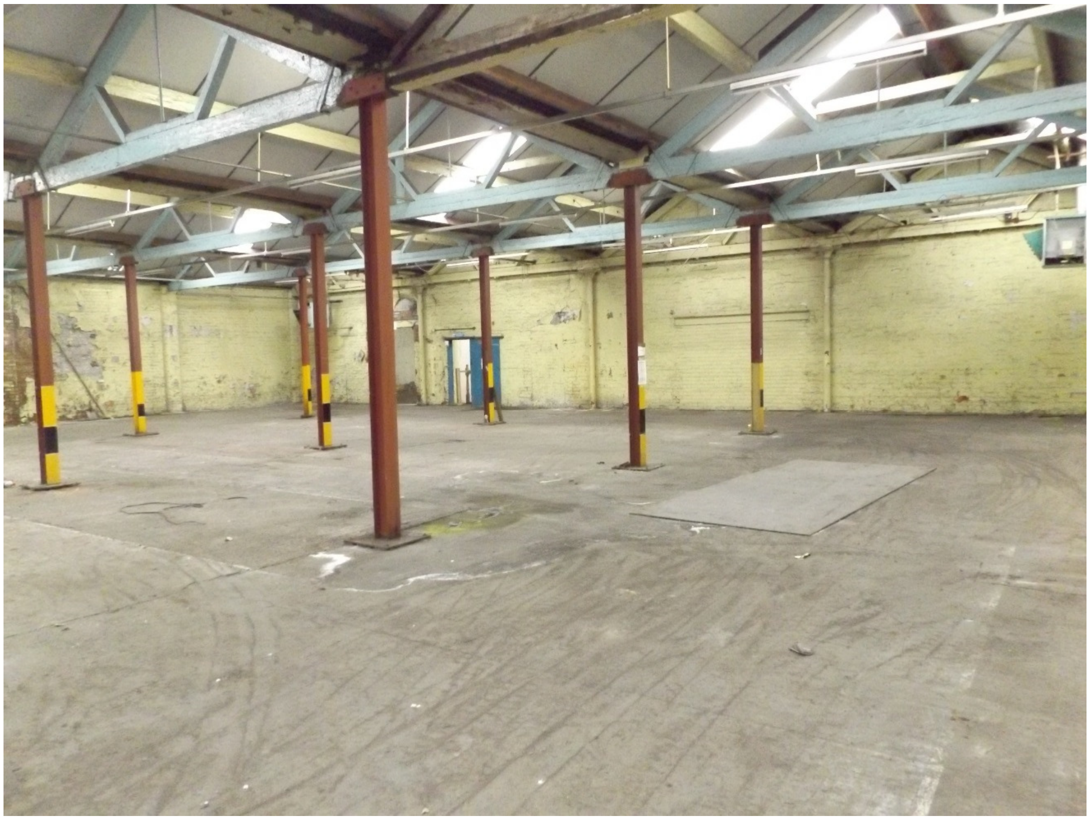


Plate 17: Looking north-west from within the south-easterly section of the existing building.

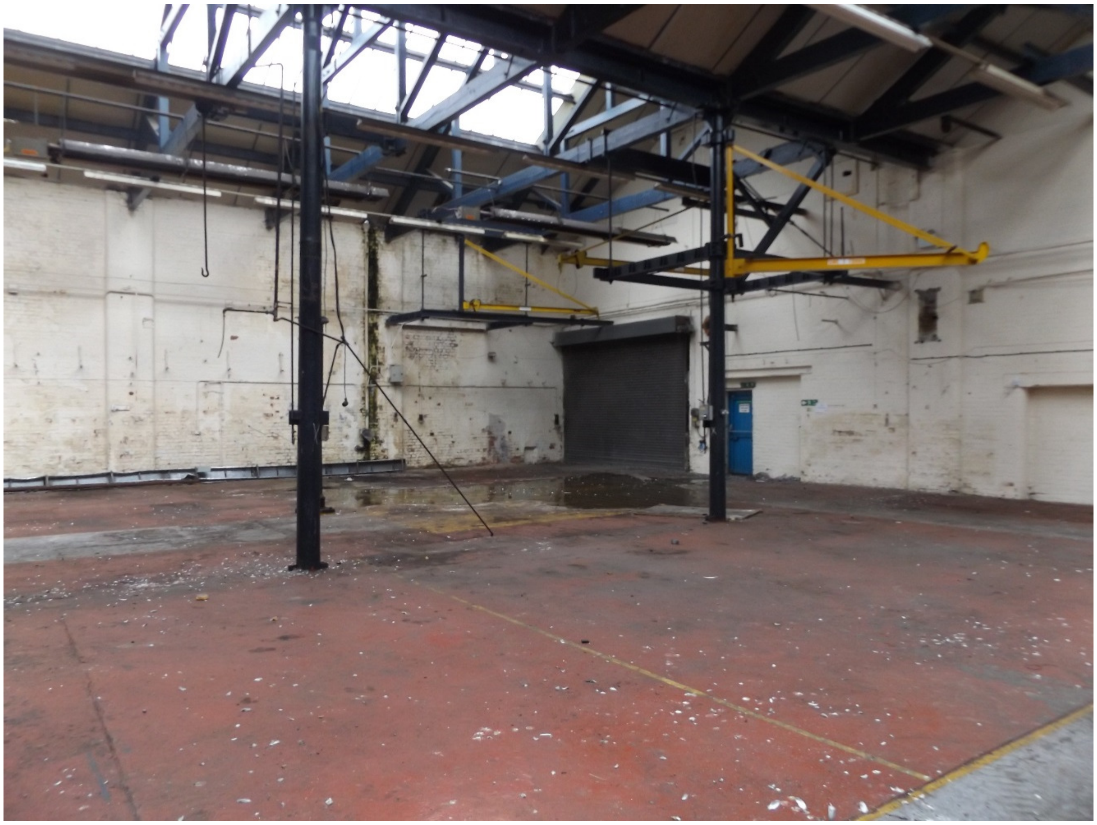


Plate 18: View of access (see plate 9) from inside building.

## Area E

Plate 19: Looking north-west over the MCC carpark.

Plate 20: Looking east. Factory building in Area F is abutting the carpark from the east.

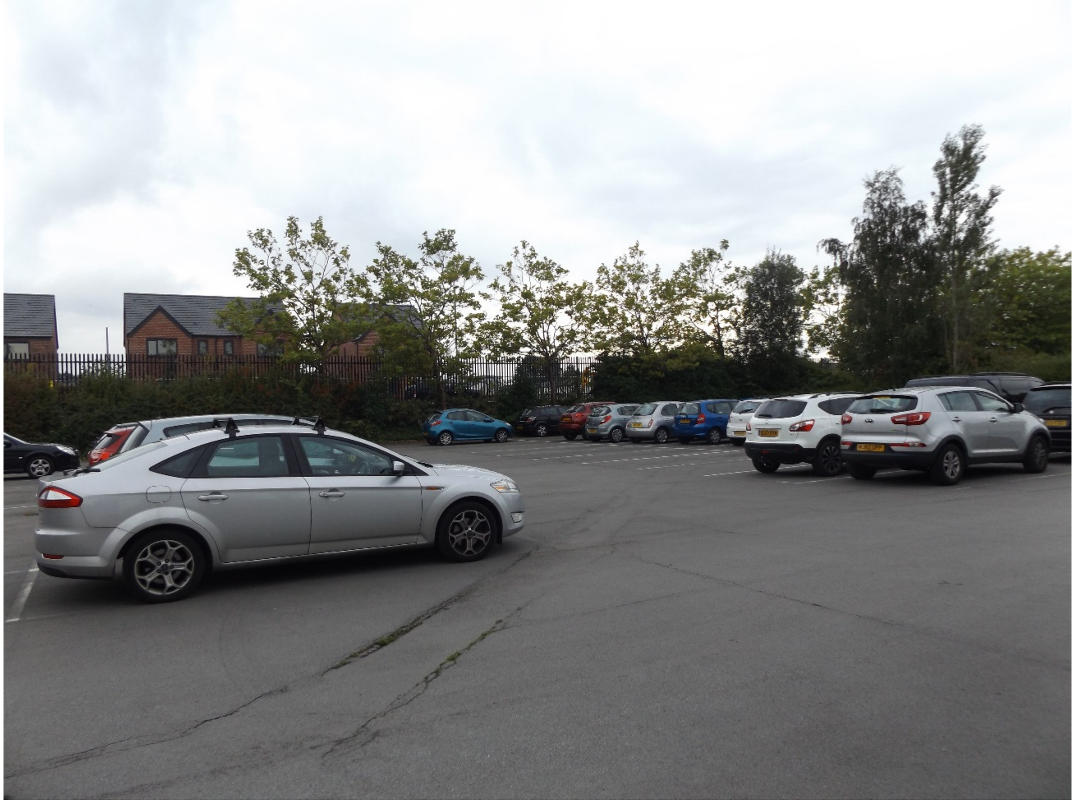


Plate 21: Tension cracks in macadam surface along the line of services.

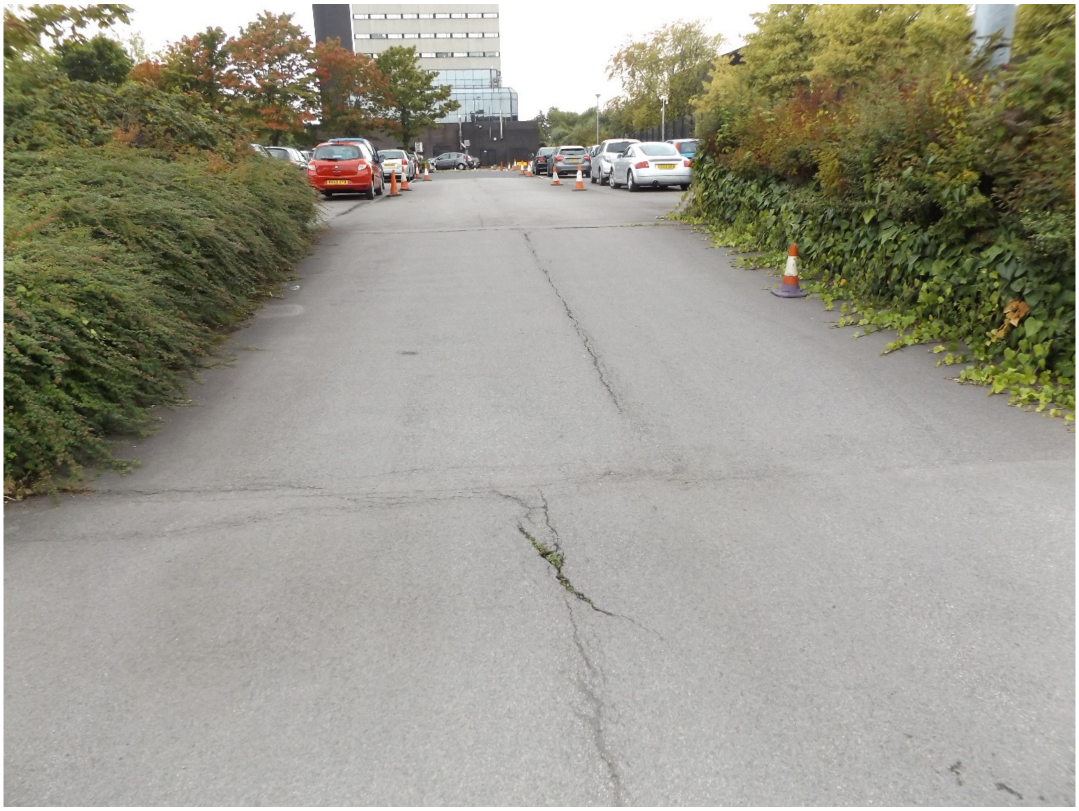
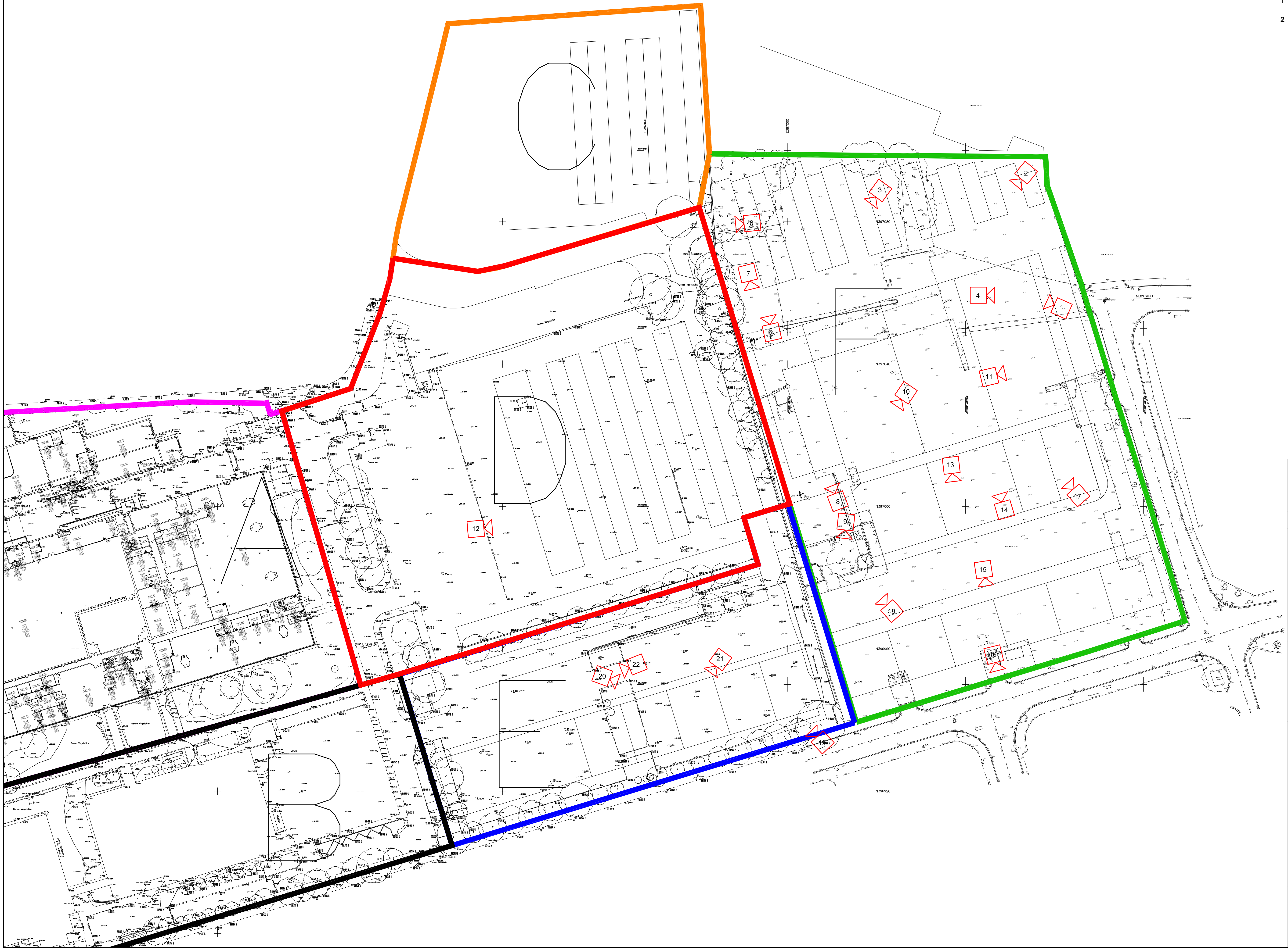


Plate 22: More tension cracks. Area C can be seen at the top of the plate.



## Notes.

1 All dimensions and levels are in metres unless noted otherwise.

2 This drawing is to be read in conjunction with all relevant Architects and Service Engineers drawings.

## Legend

4 Plate No. and Direction

| Rev | Drawn | Date | Description |
|---|---|---|---|

**Drawing Status**
INFORMATION

**Contract**
SPACE PROJECT, WEST GORTON, MANCHESTER

**Drawing Title**
PHOTOGRAPH LOCATION PLAN

**Integra**
**consulting**
**environmental**

**Suite 4, 14-32 Hewitt Street, Manchester, M15 4GB**
**email: manchester@integraconsulting.co.uk**
**web: www.integraconsulting.co.uk**
**tel: 0161 237 9310**

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| **Scales** | 1:1000@A1 | **Date** | OCT 2015 |
| **Drawn** | MC | **Checked** | AE |
| **Contract No** | 2913 | **Drawing No** | SI–02 P1 |

# APPENDIX 3

## HISTORICAL ORDNANCE SURVEY MAPS AND HISTORICAL DATA REPORT

# Historical Mapping Legends

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

Quarry
Gravel Pit
Sand Pit
Clay Pit
Shingle
Refuse Heap
Sloping Masonry
Flat Rock
Marsh
Reeds
Osiers
Rough Pasture
Furze
Wood
Mixed Wood
Brushwood
Orchard
Fir
Ford
Stepping Stones
Ferry
Waterfall
Lock
Trig. Station
507 Altitude at Trig. Station
B.M.325·9 Bench Mark
342 Surface Level
Arrow denotes flow of water
Antiquities (site of)
Cutting
Embankment
Railway crossing Road
Level Crossing
Road crossing Railway
Railway crossing River or Canal
Road over single stream
Road over River or Canal

County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
Co. Boro. Bdy. County Borough Boundary (England)
Co. Burgh Bdy. County Burgh Boundary (Scotland)

| | | | |
|---|---|---|---|
| *B P B S* | Boundary Post or Stone | *P.C.B* | Police Call Box |
| *B.R.* | Bridle Road | *P* | Pump |
| *E.P* | Electricity Pylon | *S.P* | Signal Post |
| *F.B.* | Foot Bridge | *Sl.* | Sluice |
| *F.P.* | Foot Path | *Sp.* | Spring |
| *G.P* | Guide Post or Board | *T.C.B* | Telephone Call Box |
| *M.S* | Mile Stone | *Tr.* | Trough |
| *M.P M.R* | Mooring Post or Ring | *W* | Well |

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

Inactive Quarry, Chalk Pit or Clay Pit
Active Quarry, Chalk Pit or Clay Pit
Rock
Boulders
Cliff
Slopes
Top
Roofed Building
Glazed Roof Building
Top
Sloping Masonry
Archway
Non-Coniferous Tree (surveyed)
Coniferous Tree (surveyed)
Non-Coniferous Trees (not surveyed)
Coniferous Trees (not surveyed)
Orchard Tree
Scrub
Bracken
Coppice, Osier
Reeds
Marsh, Saltings
Rough Grassland
Heath
Culvert
Direction of water flow
B M Bench Mark
Antiquity (site of)
Cave Entrance
Triangulation Station
Electricity Pylon
E T L Electricity Transmission Line

County Boundary (Geographical)
County & Civil Parish Boundary
Civil Parish Boundary
Admin. County or County Bor. Boundary
L B Bdy London Borough Boundary
Symbol marking point where boundary mereing changes

| | | | |
|---|---|---|---|
| BH | Beer House | P | Pillar, Pole or Post |
| BP, BS | Boundary Post or Stone | PO | Post Office |
| Cn, C | Capstan, Crane | PC | Public Convenience |
| Chy | Chimney | PH | Public House |
| D Fn | Drinking Fountain | Pp | Pump |
| El P | Electricity Pillar or Post | SB, S Br | Signal Box or Bridge |
| FAP | Fire Alarm Pillar | SP, SL | Signal Post or Light |
| FB | Foot Bridge | Spr | Spring |
| GP | Guide Post | Tk | Tank or Track |
| H | Hydrant or Hydraulic | TCB | Telephone Call Box |
| LC | Level Crossing | TCP | Telephone Call Post |
| MH | Manhole | Tr | Trough |
| MP | Mile Post or Mooring Post | Wr Pt, Wr T | Water Point, Water Tap |
| MS | Mile Stone | W | Well |
| NTL | Normal Tidal Limit | Wd Pp | Wind Pump |

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

Cliff
Slopes
Top
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Positioned Boulder
Scree
Non-Coniferous Tree (surveyed)
Coniferous Tree (surveyed)
Non-Coniferous Trees (not surveyed)
Coniferous Trees (not surveyed)
Orchard Tree
Scrub
Bracken
Coppice, Osier
Reeds
Marsh, Saltings
Rough Grassland
Heath
Culvert
Direction of water flow
Triangulation Station
Antiquity (site of)
E T L Electricity Transmission Line
Electricity Pylon
BM 231.60m Bench Mark
Buildings with Building Seed
Roofed Building
Glazed Roof Building
Civil parish/community boundary
District boundary
County boundary
Boundary post/stone
Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

| | | | |
|---|---|---|---|
| Bks | Barracks | P | Pillar, Pole or Post |
| Bty | Battery | PO | Post Office |
| Cemy | Cemetery | PC | Public Convenience |
| Chy | Chimney | Pp | Pump |
| Cis | Cistern | Ppg Sta | Pumping Station |
| Dismtd Rly | Dismantled Railway | PW | Place of Worship |
| El Gen Sta | Electricity Generating Station | Sewage Ppg Sta | Sewage Pumping Station |
| El P | Electricity Pole, Pillar | SB, S Br | Signal Box or Bridge |
| El Sub Sta | Electricity Sub Station | SP, SL | Signal Post or Light |
| FB | Filter Bed | Spr | Spring |
| Fn / D Fn | Fountain / Drinking Ftn. | Tk | Tank or Track |
| Gas Gov | Gas Valve Compound | Tr | Trough |
| GVC | Gas Governer | Wd Pp | Wind Pump |
| GP | Guide Post | Wr Pt, Wr T | Water Point, Water Tap |
| MH | Manhole | Wks | Works (building or area) |
| MP, MS | Mile Post or Mile Stone | W | Well |

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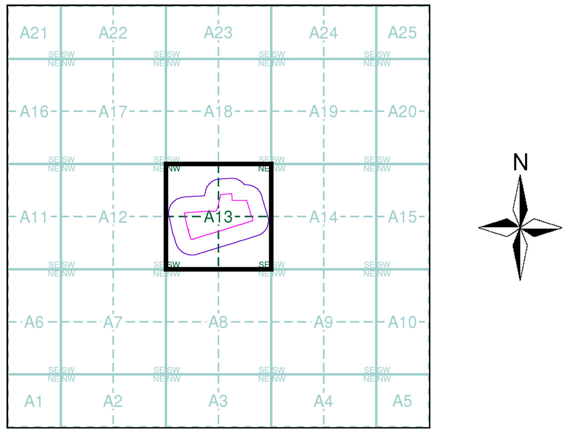
## Historical Mapping & Photography included:

| Mapping Type | Scale | Date | Pg |
|---|---|---|---|
| Lancashire And Furness | 1:2,500 | 1893 | 2 |
| Lancashire And Furness | 1:2,500 | 1908 | 3 |
| Lancashire And Furness | 1:2,500 | 1922 | 4 |
| Ordnance Survey Plan | 1:1,250 | 1948 - 1950 | 5 |
| Ordnance Survey Plan | 1:2,500 | 1950 - 1951 | 6 |
| Ordnance Survey Plan | 1:1,250 | 1953 - 1979 | 7 |
| Ordnance Survey Plan | 1:2,500 | 1964 - 1967 | 8 |
| Ordnance Survey Plan | 1:1,250 | 1975 - 1990 | 9 |
| Supply of Unpublished Survey Information | 1:1,250 | 1975 - 1976 | 10 |
| Additional SIMs | 1:1,250 | 1977 - 1983 | 11 |
| Additional SIMs | 1:1,250 | 1985 - 1988 | 12 |
| Large-Scale National Grid Data | 1:1,250 | 1992 | 13 |
| Additional SIMs | 1:1,250 | 1992 | 14 |
| Large-Scale National Grid Data | 1:1,250 | 1993 - 1995 | 15 |
| Large-Scale National Grid Data | 1:1,250 | 1995 | 16 |
| Large-Scale National Grid Data | 1:1,250 | 1996 | 17 |
| Large-Scale National Grid Data | 1:1,250 | 1996 | 18 |

## Historical Map - Segment A13



## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 100 |

## Site Details

Site at 386930, 397100

Landmark Information Group

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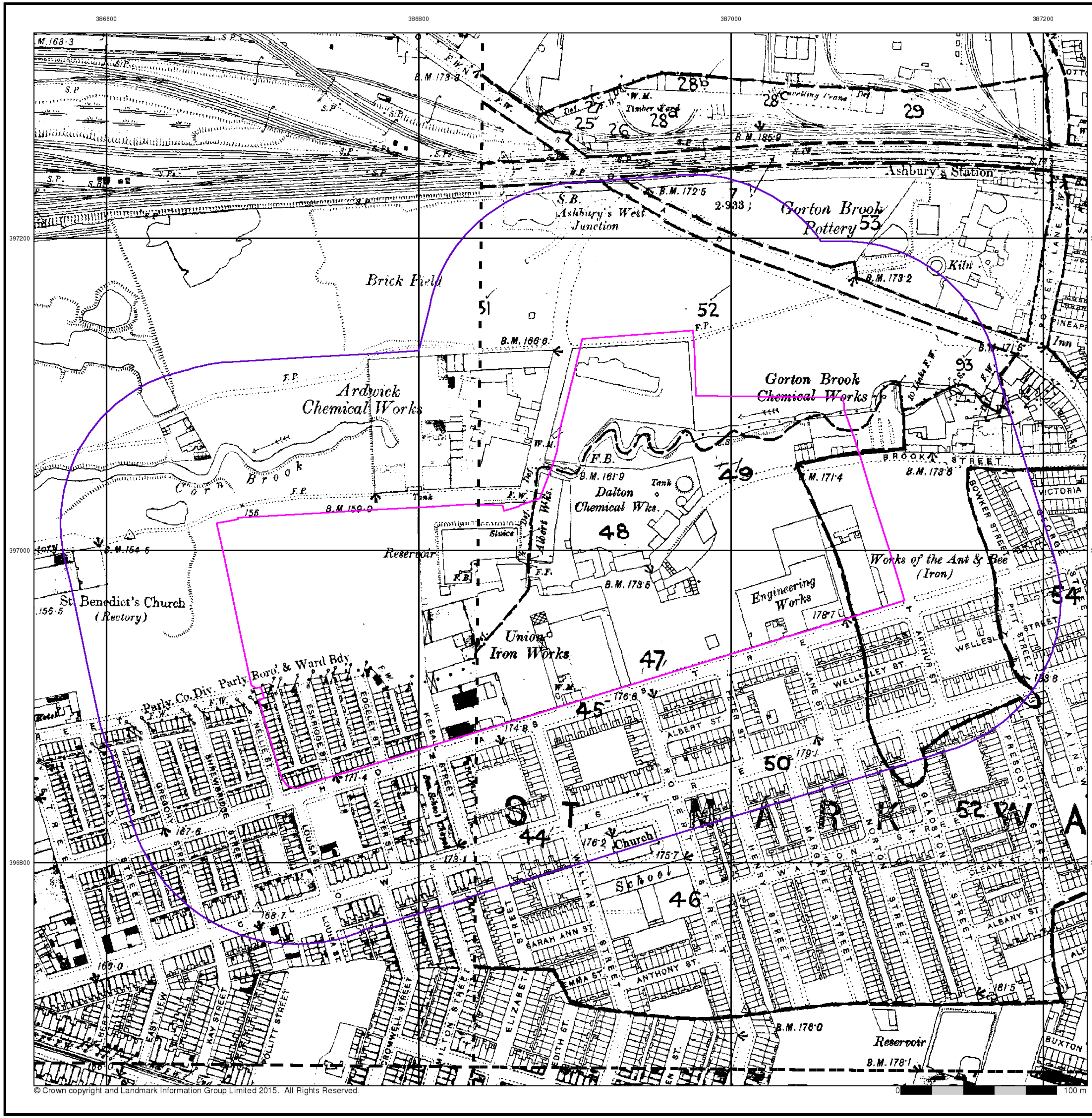
Fax: 0844 844 9951
Web: www.envirocheck.co.uk


386600
386800
387000
387200
397200
397000
396800
Ashbury's Station
S.B.
Ashbury's West Junction
Gorton Brook Pottery
Kiln
Brick Field
Ardwick Chemical Works
Gorton Brook Chemical Works
Corn Brook
Dalton Chemical Wks.
Albert Wks.
Reservoir
Sluice
Works of the Ant & Bee (Iron)
Engineering Works
St. Benedict's Church (Rectory)
Union Iron Works
Parly. Co. Div. Parly. Boro. & Ward Bdy.
Timber Yard
Travelling Crane
Brook Street
Victoria
Bowker Street
Wellesley St.
Albert St.
Church
School
Sarah Ann St.
Emma St.
Anthony St.
Reservoir
St. Mark's Ward
Inn
0
100 m

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# Envirocheck®

## Lancashire And Furness

## Published 1893

## Source map scale - 1:2,500

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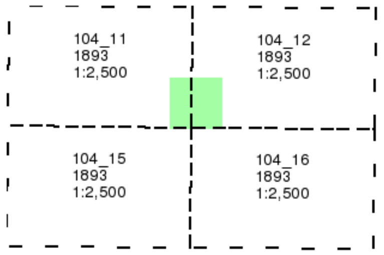
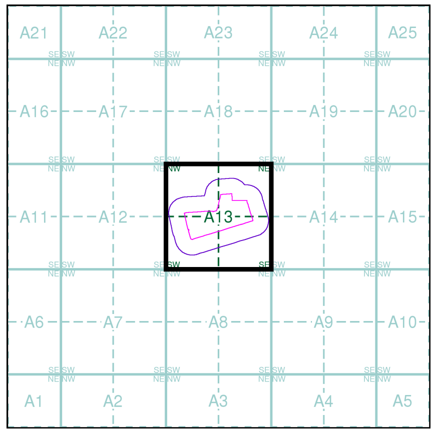
## Map Name(s) and Date(s)


104_11
1893
1:2,500
104_12
1893
1:2,500
104_15
1893
1:2,500
104_16
1893
1:2,500

## Historical Map - Segment A13


A21
A22
A23
A24
A25
A16
A17
A18
A19
A20
A11
A12
A13
A14
A15
A6
A7
A8
A9
A10
A1
A2
A3
A4
A5
N

## Order Details

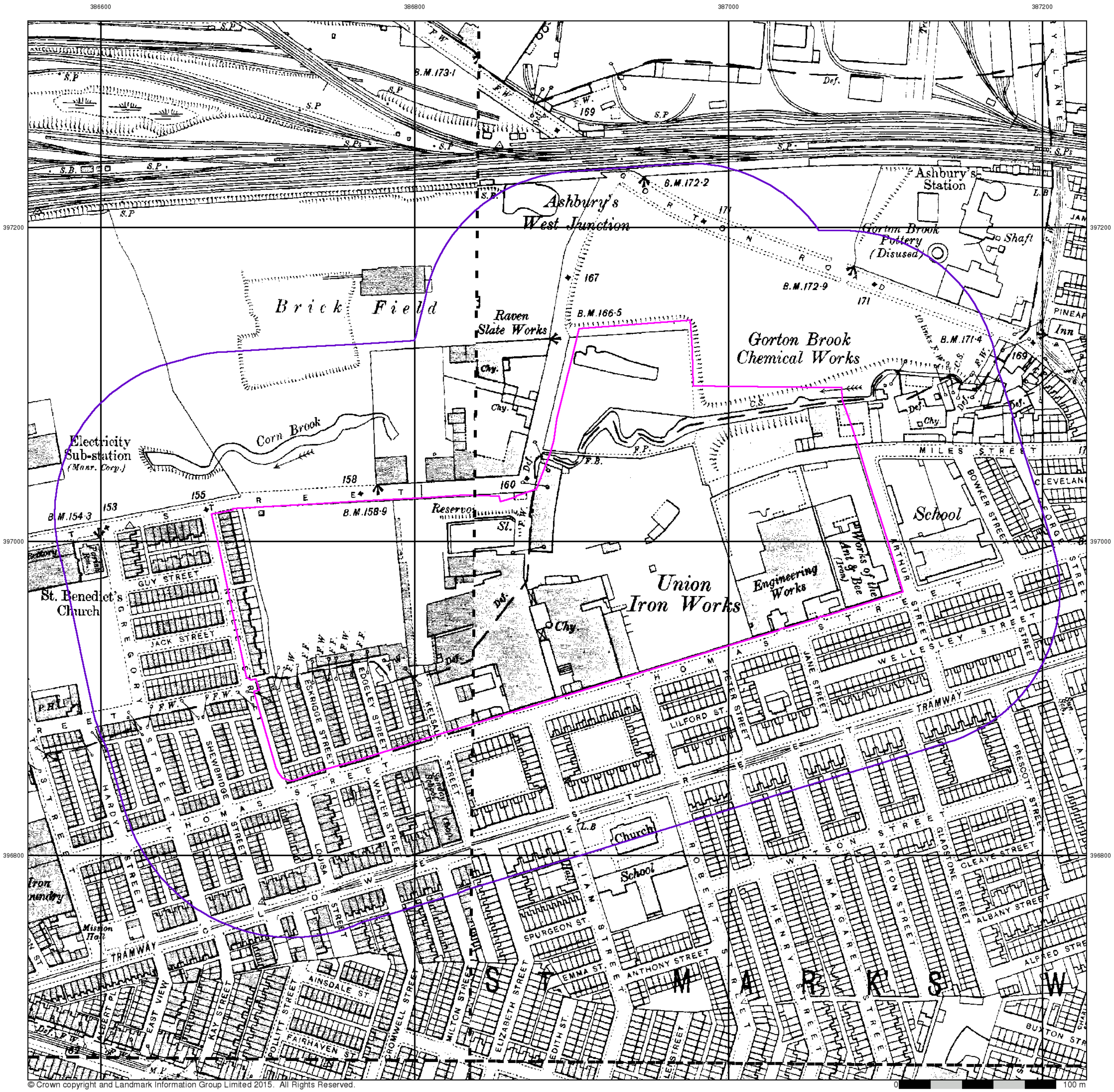
| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 100 |

## Site Details

Site at 386930, 397100

Landmark Information Group

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


386600
386800
387000
387200
397200
397000
396800
S.P
B.M.173·1
F.W.
169
Def.
S.B.
Ashbury's West Junction
B.M.172·2
171
G O R T O N R O A D
Ashbury's Station
L.B
Gorton Brook Pottery (Disused)
Shaft
JAM
B.M.172·9
B r i c k F i e l d
167
Raven Slate Works
B.M.166·5
Gorton Brook Chemical Works
B.M.171·4
PINEAP
Inn
Chy.
C.S.
Def.
Corn Brook
Electricity Sub-station (Manr. Corp.)
F.P.
F.B.
M I L E S S T R E E T
BOWKER STREET
CLEVELAN
158
160
155
153
B.M.154·3
R E E T
B.M.158·9
Reservoir
Sl.
School
GEORGE STREET
St. Benedict's Church
GUY STREET
JACK STREET
GREGORY
Union Iron Works
Engineering Works
Works of the Ant & Bee (Iron)
ARTHUR STREET
WELLESLEY STREET
PITT STREET
T H O M A S S T R E E T
JANE STREET
PETER STREET
LILFORD ST.
TRAMWAY
ESKRIDGE STREET
EDGELEY STREET
KELSALL
P.H.
HARDY STREET
SHEWBRIDGE STREET
WALTER STREET
LOUISA STREET
PRESCOTT STREET
Church
School
WILLIAM STREET
ROBERT STREET
HENRY STREET
MARGARET STREET
NORTON STREET
GLADSTONE STREET
CLEAVE STREET
ALBANY STREET
ALFRED STREET
BUXTON STREET
Iron Foundry
Mission Hall
TRAMWAY
SPURGEON ST.
EMMA ST.
ANTHONY STREET
S T M A R K S W
ALBERT PL
EAST VIEW
KAY STREET
AINSDALE ST
POLLITT STREET
FAIRHAVEN
CROMWELL STREET
MILTON STREET
ELIZABETH STREET
EDITH ST.
M.P.
0
100 m

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**Envirocheck**®

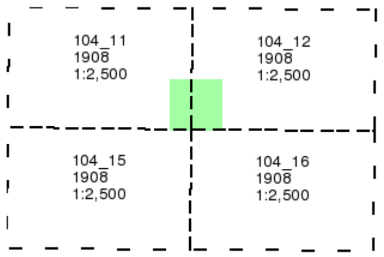
## Lancashire And Furness

## Published 1908

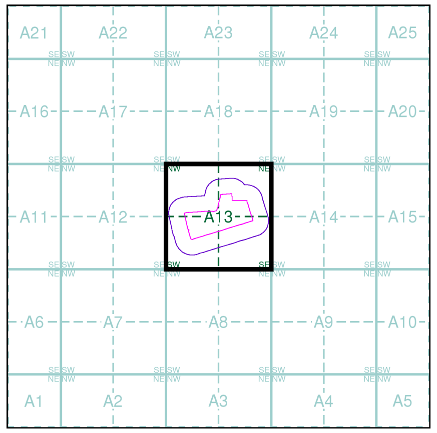
## Source map scale - 1:2,500

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)


104_11
1908
1:2,500
104_12
1908
1:2,500
104_15
1908
1:2,500
104_16
1908
1:2,500

## Historical Map - Segment A13


A21
A22
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A6
A7
A8
A9
A10
A1
A2
A3
A4
A5
N

## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 100 |

## Site Details

Site at 386930, 397100

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Information Group

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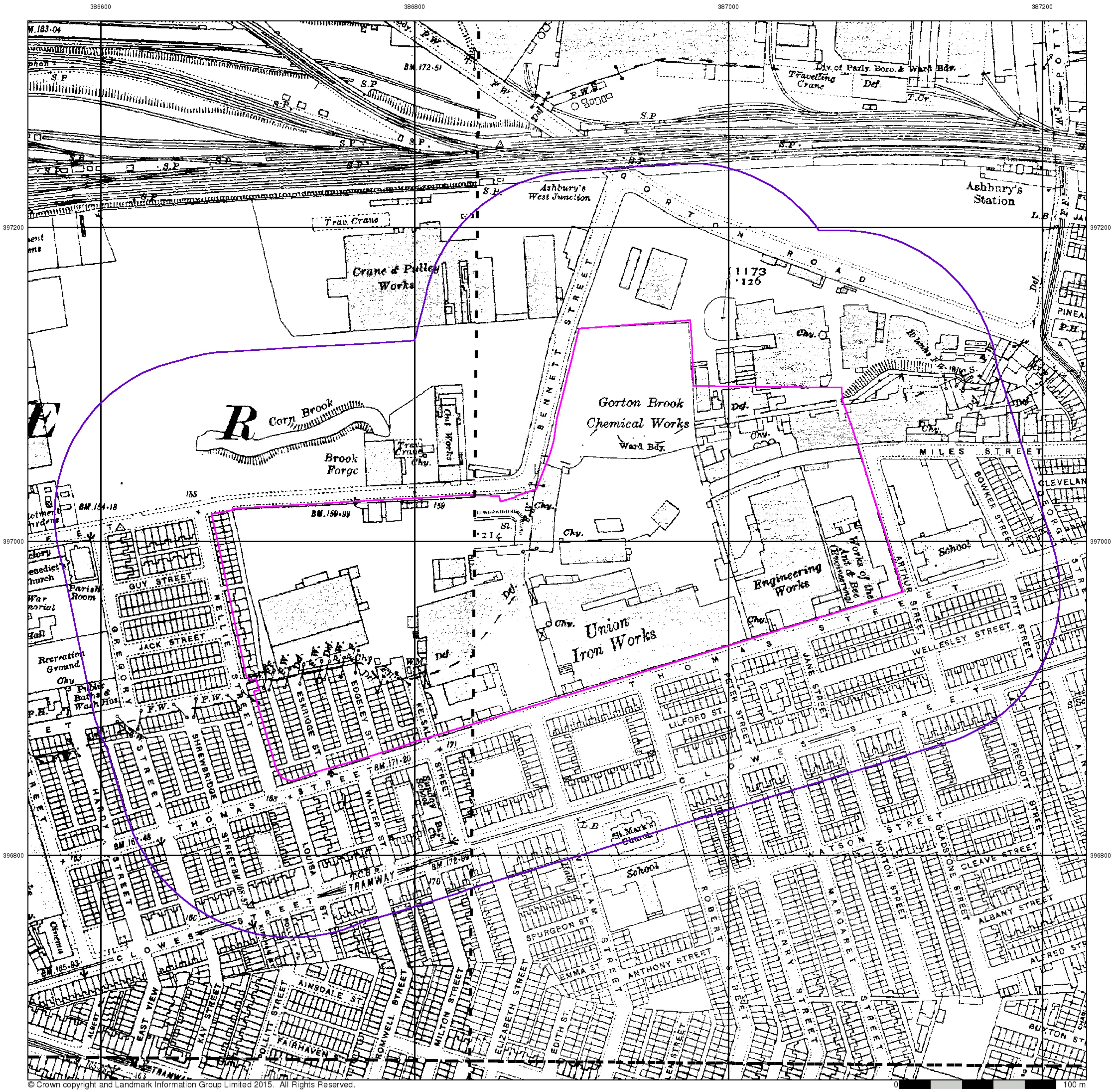
|---|---|
| Tel: | 0844 844 9952 |
| Fax: | 0844 844 9951 |
| Web: | www.envirocheck.co.uk |


386600
386800
387000
387200
397200
397000
396800
Ashbury's West Junction
Ashbury's Station
Trav. Crane
Crane & Pulley Works
Corn Brook
Brook Forge
Gorton Brook Chemical Works
Ward Bdy.
Union Iron Works
Engineering Works
Works of the Ant & Bee (Engineering)
School
St. Mark's Church
Div. of Parly. Boro. & Ward Bdy.
Travelling Crane
BENNETT STREET
MILES STREET
GUY STREET
JACK STREET
GREGORY STREET
NELLIE STREET
THOMAS STREET
WELLESLEY STREET
PITT STREET
JANE STREET
PETER STREET
MILFORD ST.
ESKRIGE ST.
EDGELEY ST.
WALTER ST.
LOUISA ST.
SHREWBRIDGE STREET
STRETHAM STREET
ROBERT STREET
HENRY STREET
MARGARET STREET
NORTON STREET
GLADSTONE STREET
CLEAVE STREET
ALBANY STREET
ALFRED STR.
PRESCOTT STREET
SPURGEON ST.
EMMA ST.
ANTHONY STREET
ELIZABETH STREET
EDITH ST.
AINSDALE ST.
FAIRHAVEN ST.
MILTON STREET
CROMWELL STREET
KAY STREET
EAST VIEW
BUXTON ST.
TRAMWAY
Recreation Ground
Public Baths & Wash Ho.
Parish Room
0
100 m
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# Envirocheck®

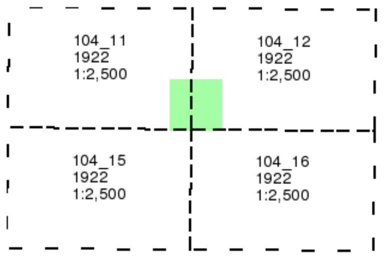
## Lancashire And Furness

## Published 1922

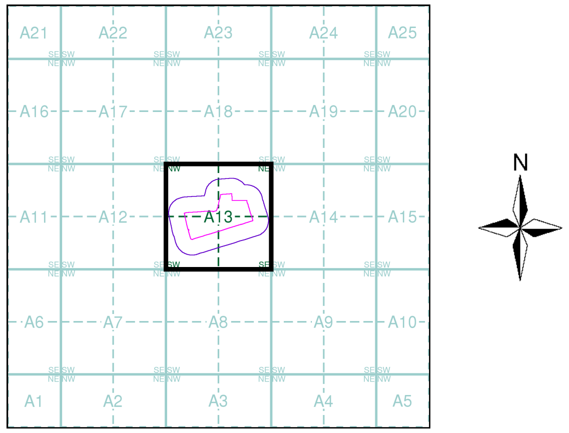
## Source map scale - 1:2,500

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)


104_11
1922
1:2,500
104_12
1922
1:2,500
104_15
1922
1:2,500
104_16
1922
1:2,500

## Historical Map - Segment A13


A21
A22
A23
A24
A25
A16
A17
A18
A19
A20
A11
A12
A13
A14
A15
A6
A7
A8
A9
A10
A1
A2
A3
A4
A5
N

## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 100 |

## Site Details

Site at 386930, 397100

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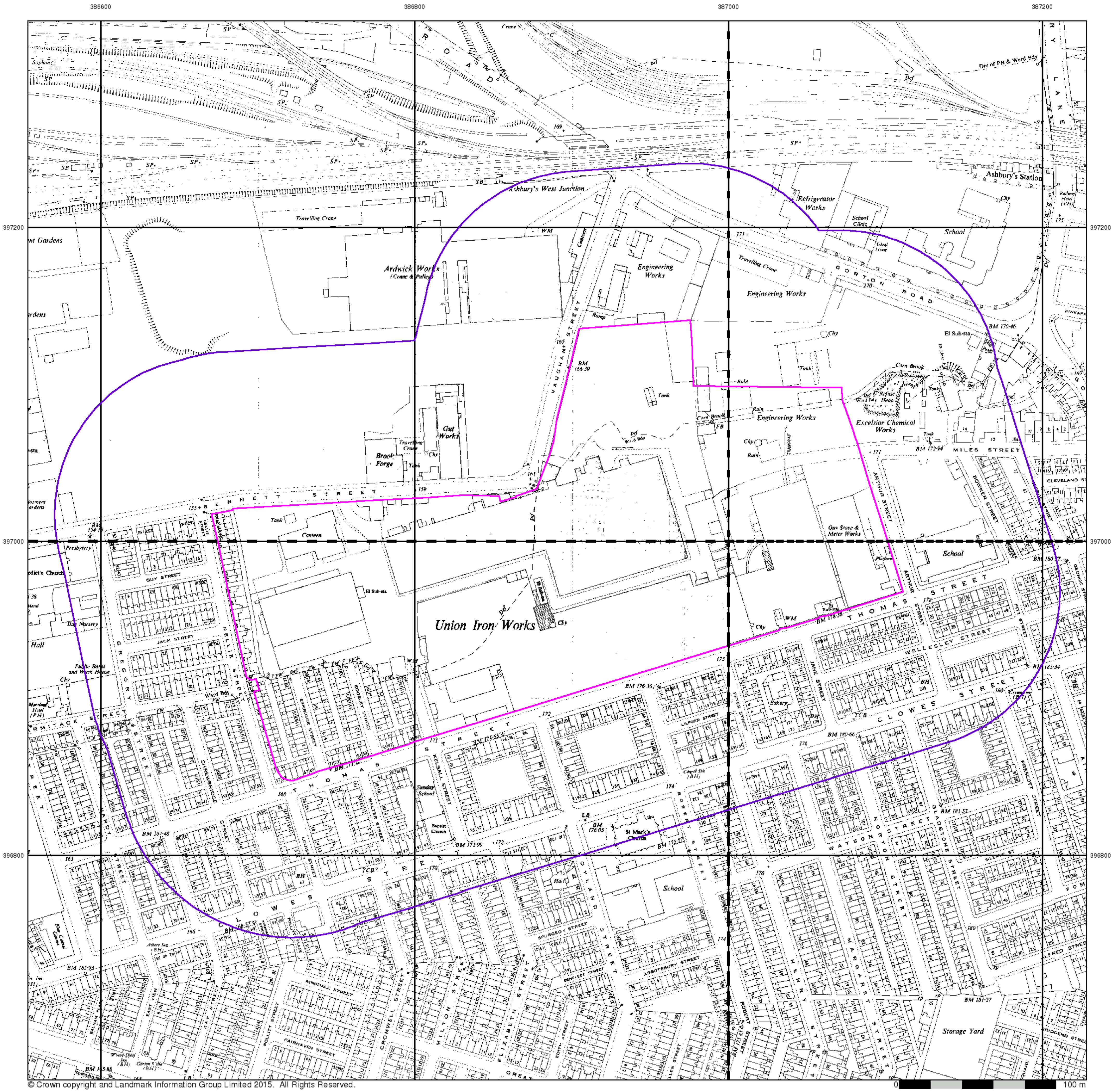
| | |
|---|---|
| Tel: | 0844 844 9952 |
| Fax: | 0844 844 9951 |
| Web: | www.envirocheck.co.uk |


386600
386800
387000
387200
397200
397000
396800
Ashbury's West Junction
Ashbury's Station
Travelling Crane
Refrigerator Works
School Clinic
School
Ardwick Works (Crane & Pulley)
Engineering Works
Gorton Road
Vaughan Street
Gut Works
Brook Forge
Excelsior Chemical Works
Corn Brook
Miles Street
Bennett Street
Canteen
Union Iron Works
Guy Street
Jack Street
Presbytery
Public Baths and Wash House
Thomas Street
Wellesley Street
Clowes Street
Arthur Street
Jane Street
Bakery
Sunday School
St Mark's Church
Storage Yard
Cromwell Street
Milton Street
Elizabeth Street
0
100 m

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# Envirocheck®

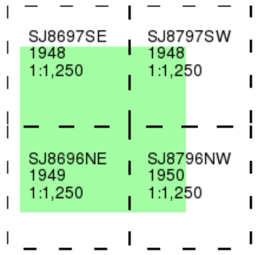
## Ordnance Survey Plan

### Published 1948 - 1950

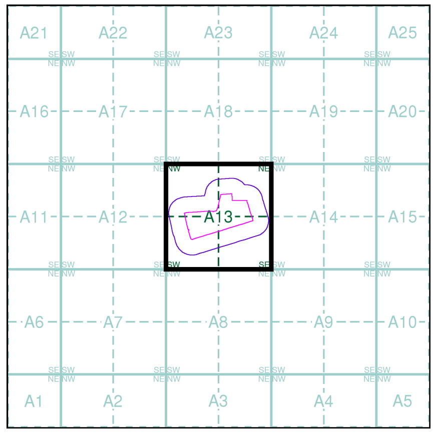
### Source map scale - 1:1,250

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)


SJ8697SE
1948
1:1,250
SJ8797SW
1948
1:1,250
SJ8696NE
1949
1:1,250
SJ8796NW
1950
1:1,250

## Historical Map - Segment A13


A21
A22
A23
A24
A25
A16
A17
A18
A19
A20
A11
A12
A13
A14
A15
A6
A7
A8
A9
A10
A1
A2
A3
A4
A5

## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 100 |

## Site Details

Site at 386930, 397100

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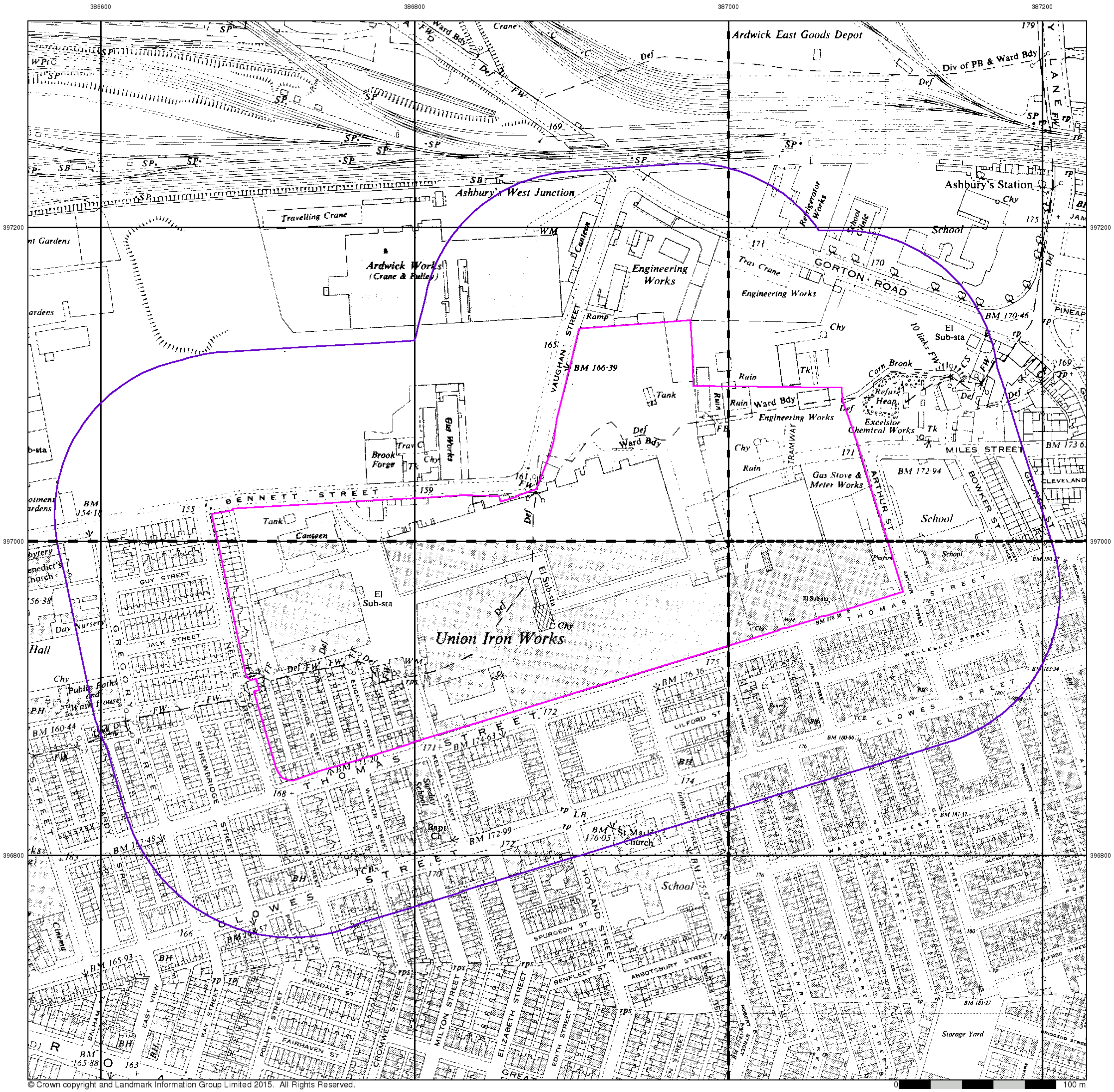
Web: www.envirocheck.co.uk



386600
386800
387000
387200
397200
397000
396800
Ardwick East Goods Depot
Div of PB & Ward Bdy
Ashbury's West Junction
Ashbury's Station
Travelling Crane
Ardwick Works (Crane & Pulley)
Engineering Works
GORTON ROAD
Trav Crane
School
Refrigerator Works
BM 170·46
El Sub-sta
10 links FW
Corn Brook
Refuse Heap
Excelsior Chemical Works
MILES STREET
BOWKER ST
CLEVELAND
BM 173·6
VAUGHAN STREET
BM 166·39
Tank
Ward Bdy
Def
Ruin
TRAMWAY
Gas Stove & Meter Works
ARTHUR ST
BM 172·94
Brook Forge
Elm Works
BENNETT STREET
Canteen
BM 154·18
GUY STREET
JACK STREET
El Sub-sta
Union Iron Works
Public Baths and Wash House
Day Nursery
Hall
BM 160·44
GREGORY STREET
NELLIE STREET
ESKRIGGE STREET
EDGELEY STREET
THOMAS STREET
BM 174·63
BM 176·36
LILFORD ST
CLOWES STREET
WELLESLEY STREET
BM 172·99
BM 176·05
St Mark's Church
Sunday School
Bapt Ch
School
HOYLAND STREET
SPURGEON ST
ABBOTSBURY STREET
BENFLEET ST
AINSDALE ST
FAIRHAVEN ST
SHREWSBRIDGE STREET
LOUISA STREET
WALTER STREET
KELSALL STREET
MILTON STREET
ELIZABETH STREET
EDITH STREET
CROMWELL STREET
POLLITT STREET
KAY STREET
EAST VIEW
BALHAM ST
BM 165·93
BM 165·88
Cinema
Storage Yard
BM 181·27
0
100 m

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**Envirocheck**®

## Ordnance Survey Plan

## Published 1950 - 1951

## Source map scale - 1:2,500

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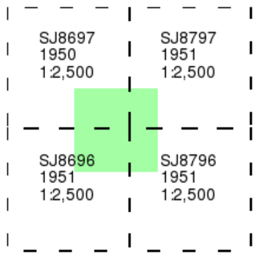
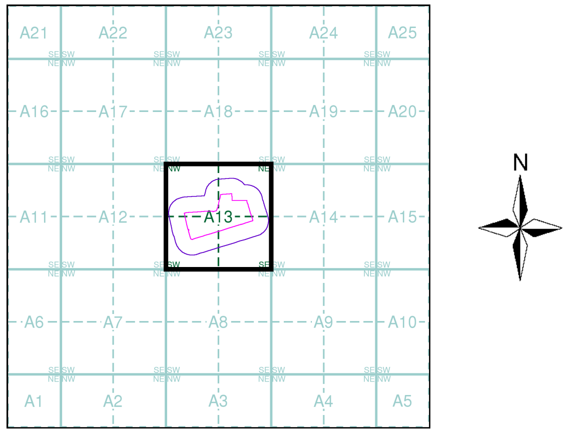
## Map Name(s) and Date(s)



SJ8697
1950
1:2,500
SJ8797
1951
1:2,500
SJ8696
1951
1:2,500
SJ8796
1951
1:2,500

## Historical Map - Segment A13



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A3
A4
A5
N

## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 100 |

## Site Details

Site at 386930, 397100

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| | |
|---|---|
| Tel: | 0844 844 9952 |
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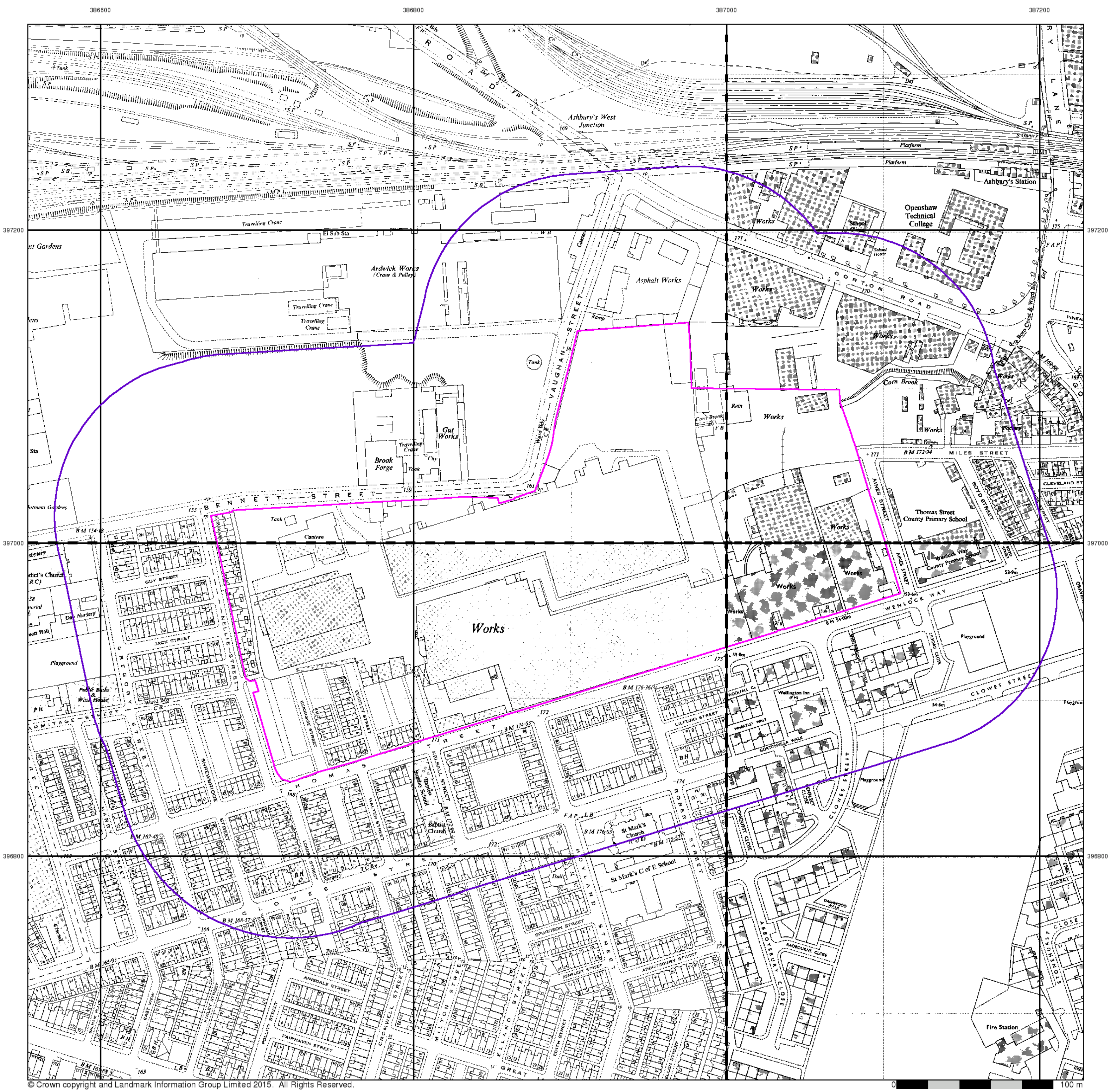
| Web: | www.envirocheck.co.uk |


386600
386800
387000
387200
397200
397000
396800
Ashbury's West Junction
Travelling Crane
El Sub Sta
Ardwick Works (Crane & Pulley)
Asphalt Works
Works
Openshaw Technical College
School
Ashbury's Station
Platform
Gorton Road
Corn Brook
Vaughan Street
Tank
Gut Works
Brook Forge
Ruin
Bennett Street
Canteen
Miles Street
Thomas Street County Primary School
Wenlock Way
Clowes Street
Guy Street
Jack Street
Gregory Street
Nellie Street
Playground
Public Baths Wash House
Armitage Street
Thomas Street
St Mark's Church
St Mark's C of E School
Baptist Church
Lilford Street
Wellington Inn
Abbotsford Close
Spurgeon Street
Aindale Street
Fairhaven Street
Cromwell Street
Fire Station
0
100 m

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# Envirocheck®

## Ordnance Survey Plan

## Published 1953 - 1979

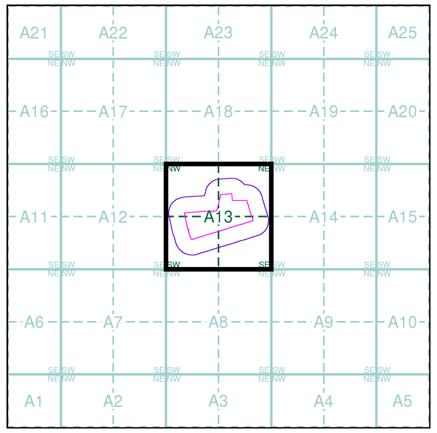
## Source map scale - 1:1,250

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)

| | |
|---|---|
| SJ8697SE<br>1953<br>1:1,250 | SJ8797SW<br>1957<br>1:1,250 |
| SJ8696NE<br>1957<br>1:1,250 | SJ8796NW<br>1979<br>1:1,250 |

## Historical Map - Segment A13


A21
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A15
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A2
A3
A4
A5
N

## Order Details

Order Number: 72946036_1_1
Customer Ref: 2913
National Grid Reference: 386890, 396990
Slice: A
Site Area (Ha): 6.84
Search Buffer (m): 100

## Site Details

Site at 386930, 397100

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Information Group

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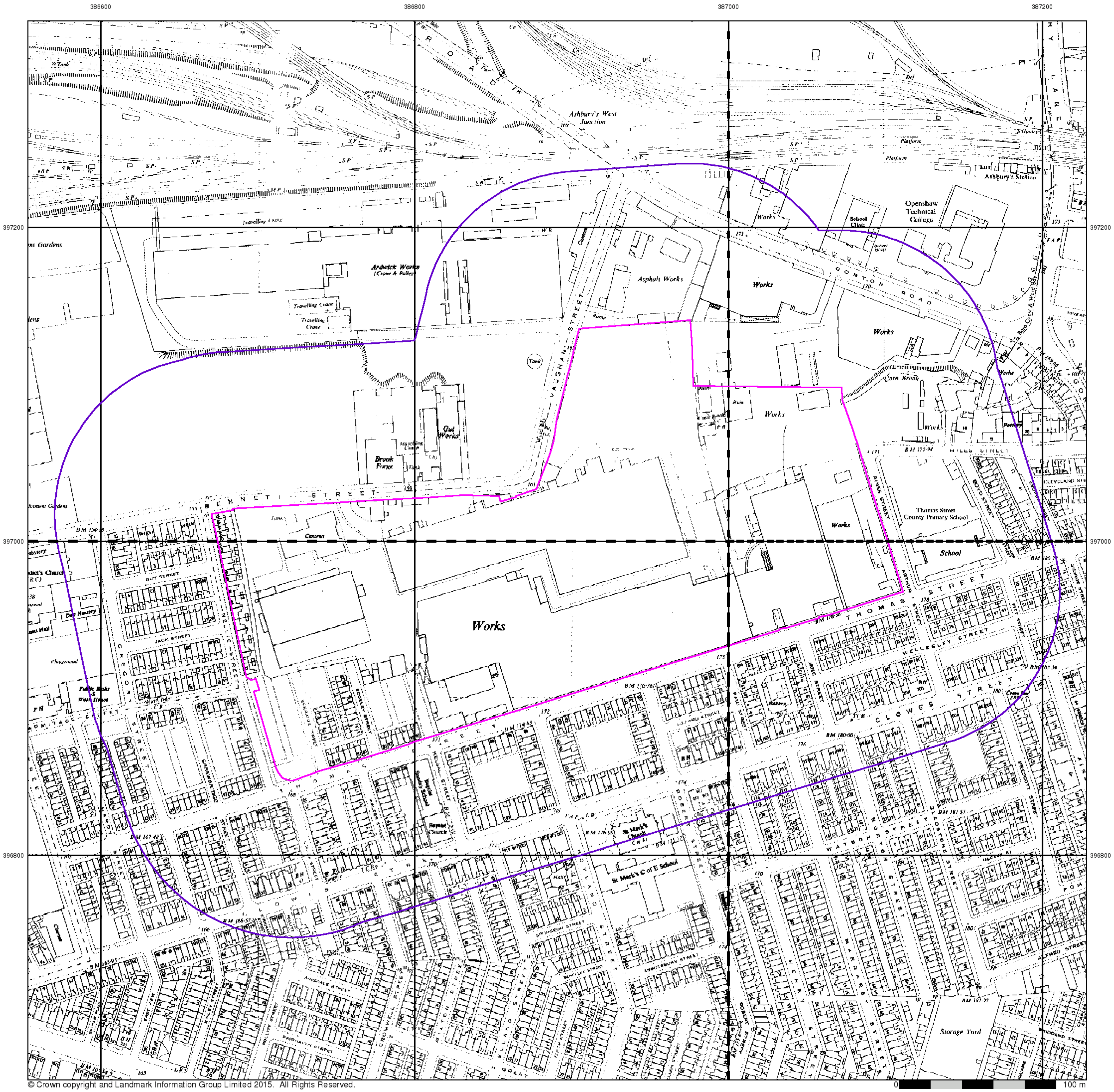
Web: www.envirocheck.co.uk


386600
386800
387000
387200
397200
397000
396800
Ashbury's West Junction
Ashbury's Station
Platform
Openshaw Technical College
School Clinic
Ardwick Works (Crane & Pulley)
Travelling Crane
Asphalt Works
Works
Gorton Road
Corn Brook
Tank
Brook Forge
Gut Works
Vaughan Street
Bennett Street
Miles Street
Thomas Street County Primary School
School
Thomas Street
Wellesley Street
Clowes Street
Guy Street
Jack Street
Day Nursery
Playground
Public Baths & Wash House
Baptist Church
St Mark's C of E School
Storage Yard
0
100 m

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# Envirocheck®

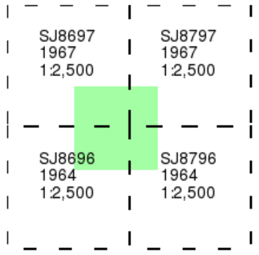
## Ordnance Survey Plan

## Published 1964 - 1967

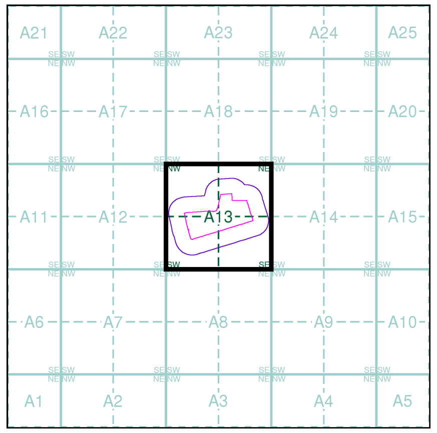
## Source map scale - 1:2,500

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)


SJ8697
1967
1:2,500
SJ8797
1967
1:2,500
SJ8696
1964
1:2,500
SJ8796
1964
1:2,500

## Historical Map - Segment A13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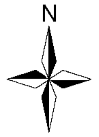

## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 100 |

## Site Details

Site at 386930, 397100

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Information Group

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|---|---|
| Tel: | 0844 844 9952 |
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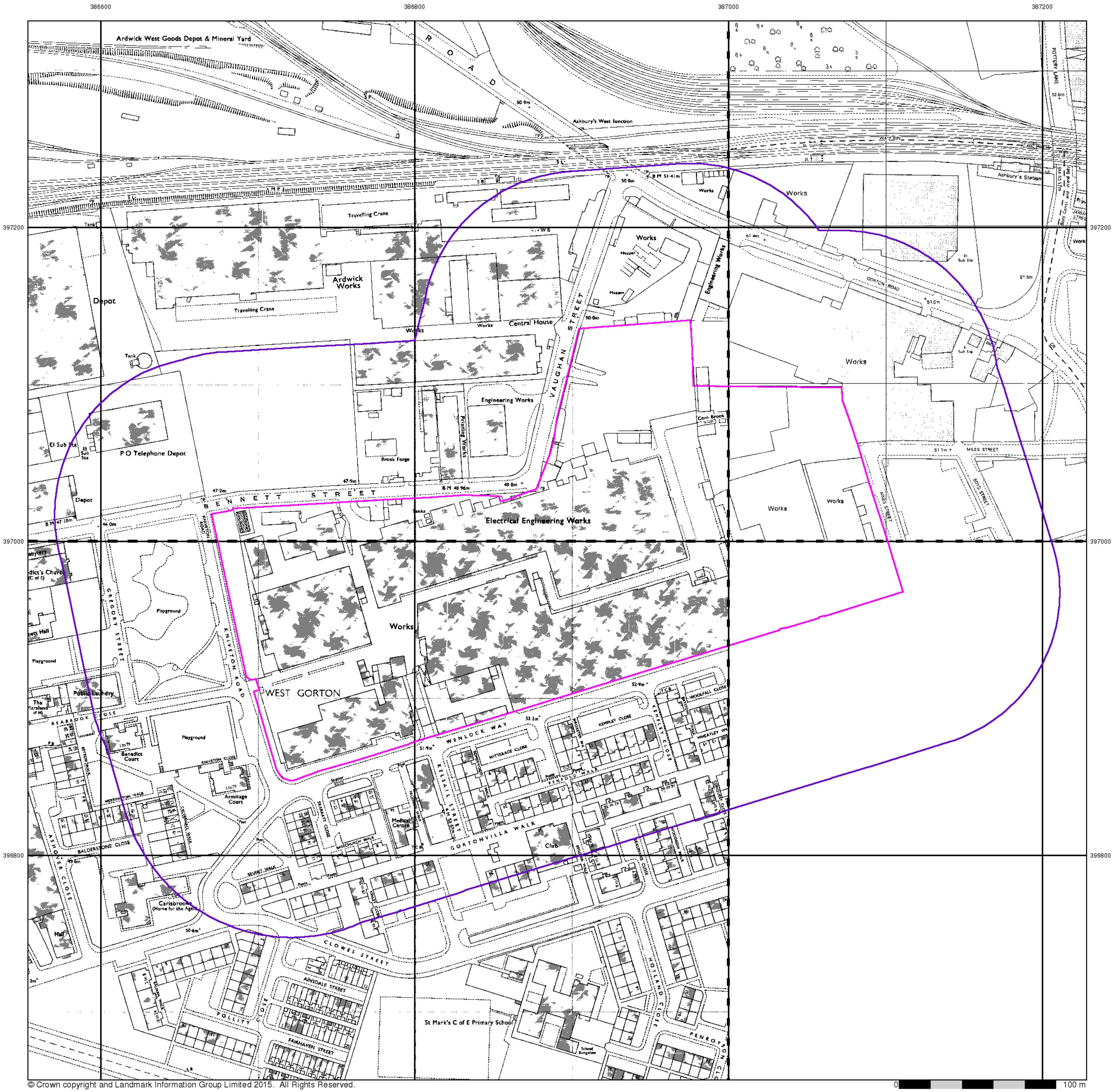
| Web: | www.envirocheck.co.uk |


386600
386800
387000
387200
397200
397000
396800
Ardwick West Goods Depot & Mineral Yard
ROAD
Ashbury's West Junction
Ashbury's Station
POTTERY LANE
Travelling Crane
Ardwick Works
Depot
Tank
Works
Central House
Engineering Works
VAUGHAN STREET
Printing Works
Brook Forge
Corn Brook
El Sub Sta
P O Telephone Depot
BENNETT STREET
Electrical Engineering Works
GORTON ROAD
MILES STREET
Works
WEST GORTON
Playground
Public Laundry
Benedict Court
Armitage Court
WENLOCK WAY
KEMPLEY CLOSE
GORTONVILLA WALK
Club
Medical Centre
CLOWES STREET
POLLITT CLOSE
ARMDALE STREET
FAIRHAVEN STREET
Carisbrooke (Home for the Aged)
St Mark's C of E Primary School
0
100 m

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# Envirocheck®

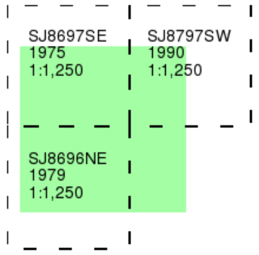
## Ordnance Survey Plan

### Published 1975 - 1990

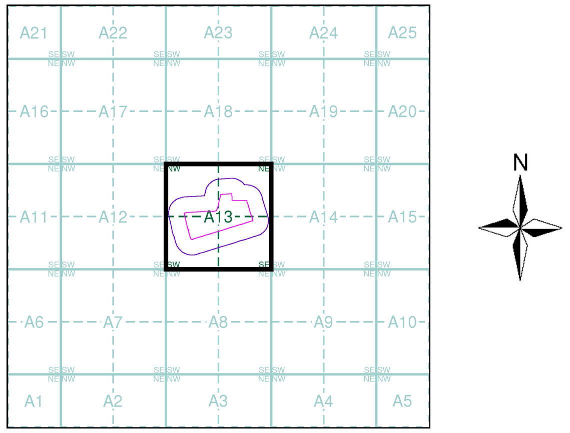
### Source map scale - 1:1,250

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)


SJ8697SE
1975
1:1,250
SJ8797SW
1990
1:1,250
SJ8696NE
1979
1:1,250

## Historical Map - Segment A13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## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 100 |

## Site Details

Site at 386930, 397100

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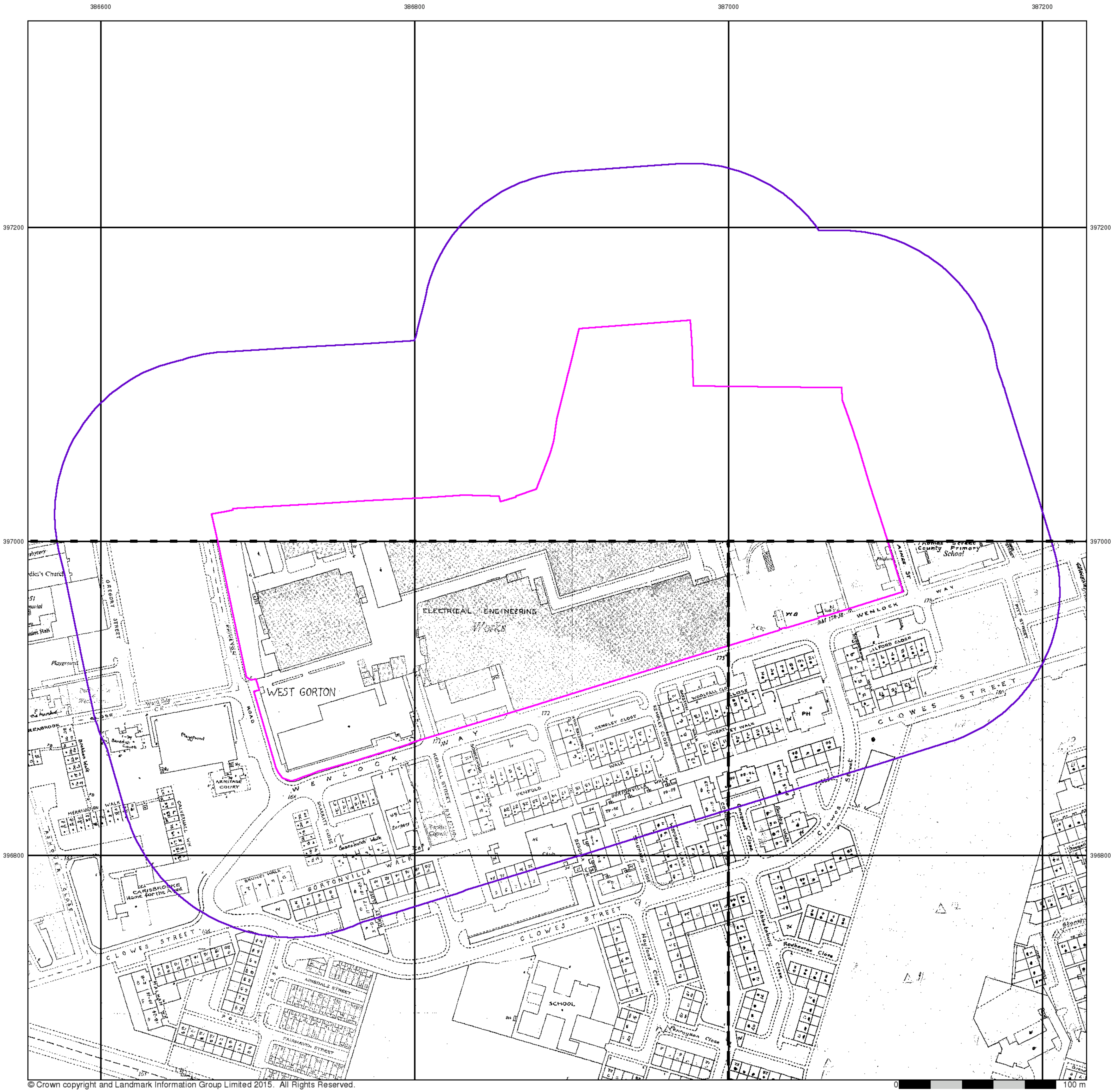
386600
386800
387000
387200
397200
397000
396800
ELECTRICAL ENGINEERING Works
WEST GORTON
WENLOCK WAY
CLOWES STREET
GORTONVILLA WALK
GREGORY STREET
ARMITAGE COURT
CARISBROOKE Home for the Aged
SCHOOL
PH
Playground
0
100 m

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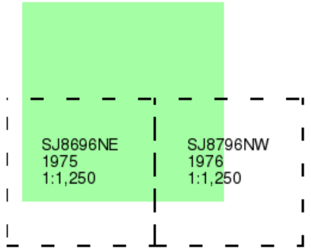
## Supply of Unpublished Survey Information

### Published 1975 - 1976

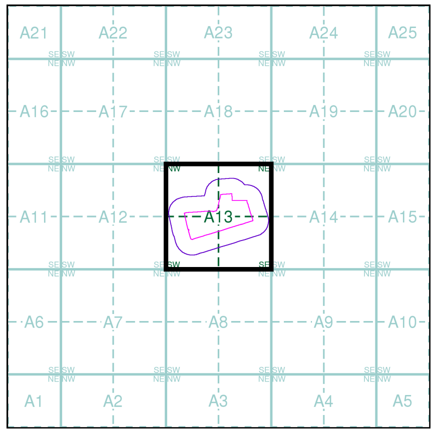
### Source map scale - 1:1,250

SUSI maps (Supply of Unpublished Survey Information) were produced between 1972 and 1977, mainly for internal use at Ordnance Survey. These were more of a `work-in-progress' plan as they showed updates of individual areas on a map. These maps were unpublished, and they do not represent a single moment in time. They were produced at both 1:2,500 and 1:1,250 scales.

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


SJ8696NE
1975
1:1,250
SJ8796NW
1976
1:1,250

## Historical Map - Segment A13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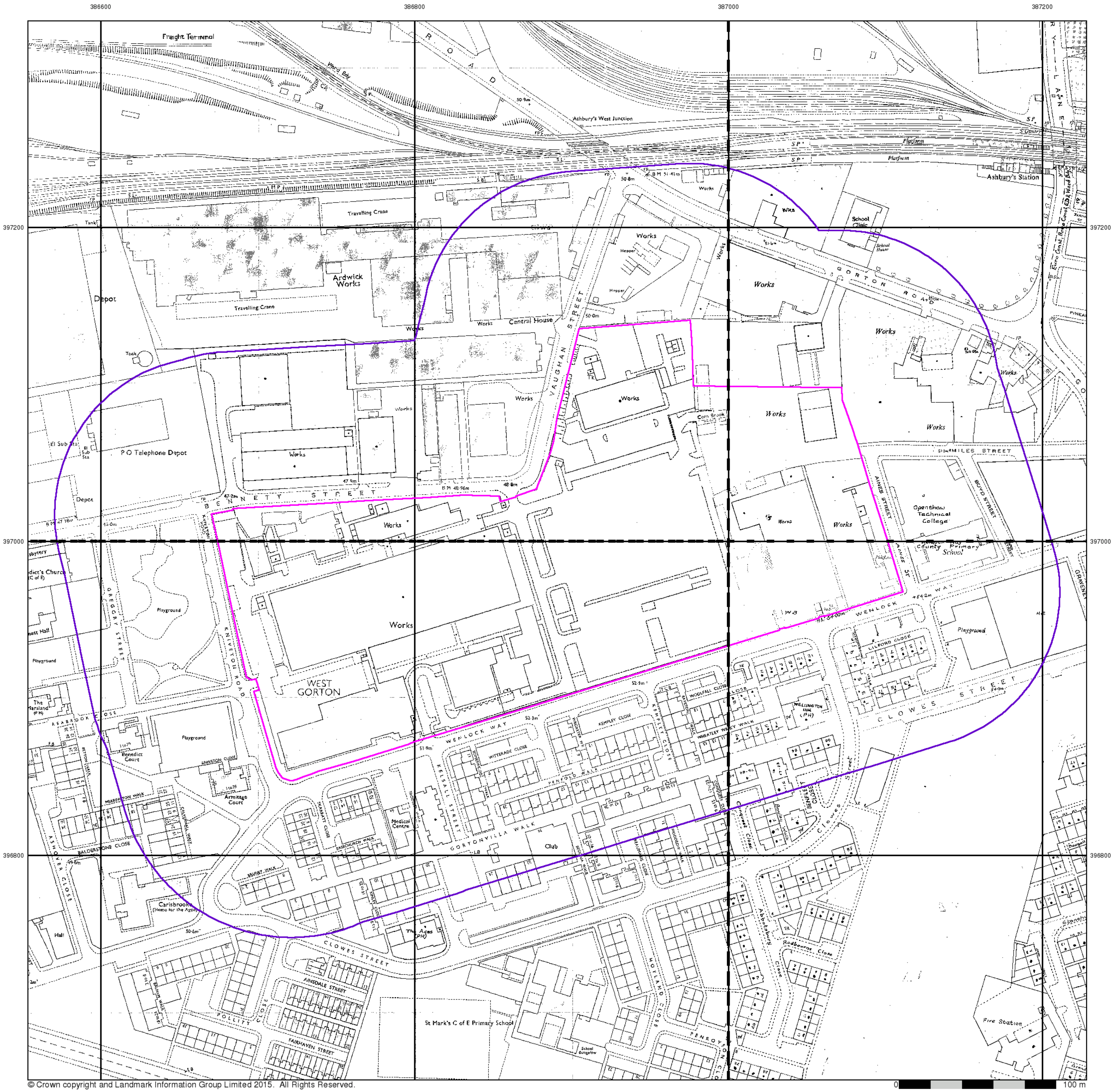
## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 100 |

## Site Details

Site at 386930, 397100

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


386600
386800
387000
387200
397200
397000
396800
Freight Terminal
Ashbury's West Junction
Platform
Ashbury's Station
Travelling Crane
Ardwick Works
Depot
Works
Central House
Tank
P O Telephone Depot
El Sub Sta
Depot
VAUGHAN STREET
GORTON ROAD
School Clinic
MILES STREET
BENNETT STREET
Openshaw Technical College
County Primary School
WENLOCK WAY
Playground
WEST GORTON
GREGORY STREET
KNIVETON ROAD
WEPLOCK WAY
CLOWES STREET
GORTON VILLA WALK
KELSALL STREET
Medical Centre
Club
Carisbrook
Armitage Court
Benedict Court
Hall
POLLITT CLOSE
ARMSDALE STREET
FAIRHAVEN STREET
St Mark's C of E Primary School
Fire Station
Radbourne Close
0
100 m

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## Additional SIMs

## Published 1977 - 1983

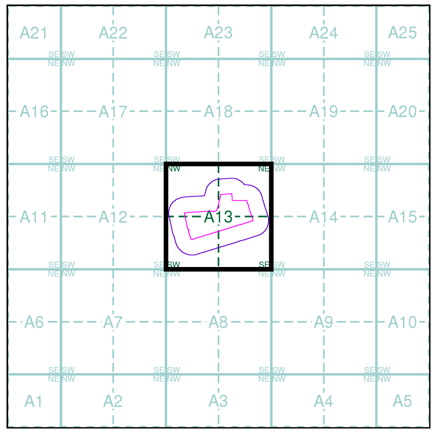
## Source map scale - 1:1,250

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)

| | |
|---|---|
| SJ8697SE<br>1983<br>1:1,250 | SJ8797SW<br>1980<br>1:1,250 |
| SJ8696NE<br>1983<br>1:1,250 | SJ8796NW<br>1977<br>1:1,250 |

## Historical Map - Segment A13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A5
N

## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 100 |

## Site Details

Site at 386930, 397100

**Landmark** Information Group

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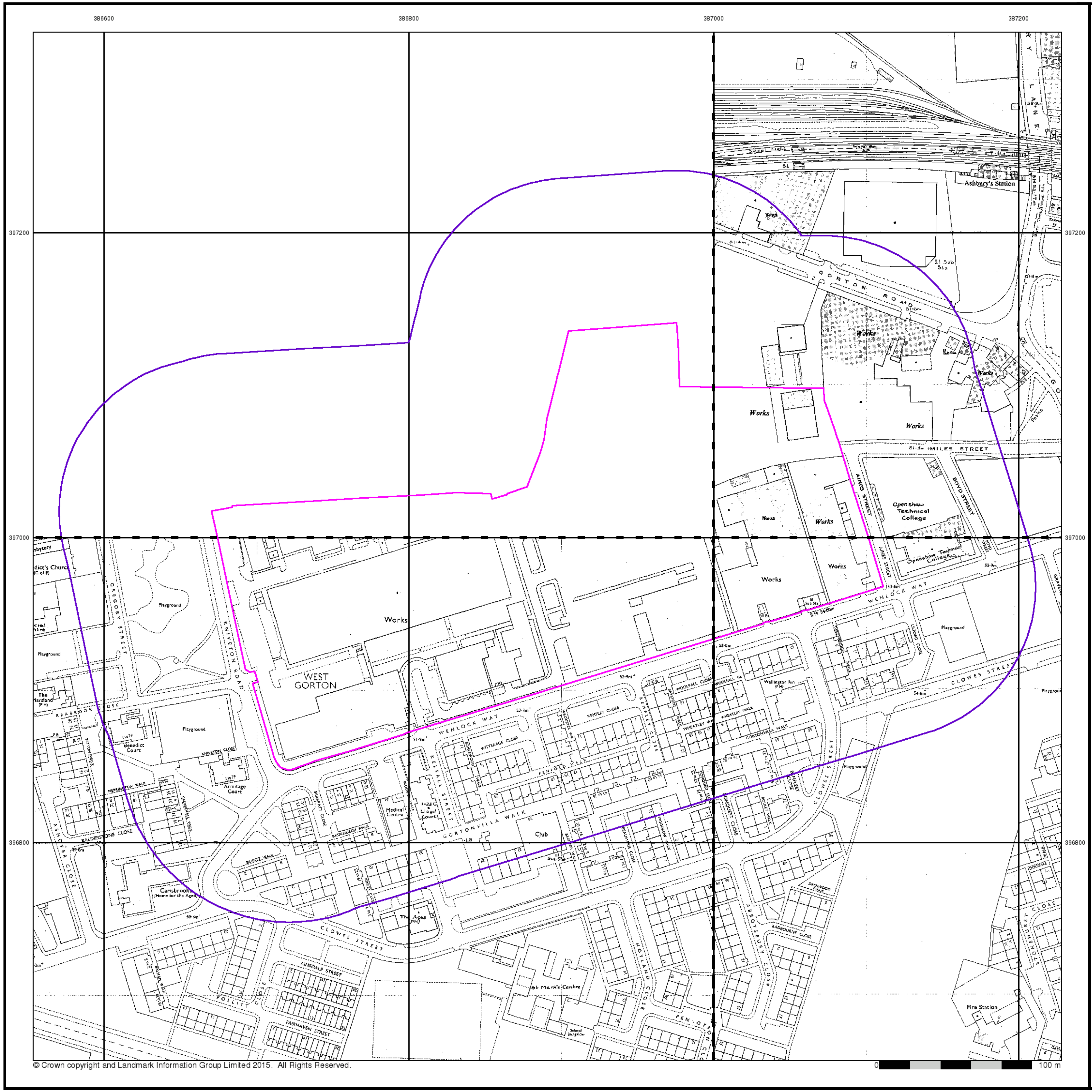
Web: www.envirocheck.co.uk


386600
386800
387000
387200
397200
397000
396800
Works
WEST GORTON
GORTON ROAD
MILES STREET
WENLOCK WAY
CLOWES STREET
Openshaw Technical College
Ashbury's Station
Playground
Club
Fire Station
St Mark's Centre
0
100 m

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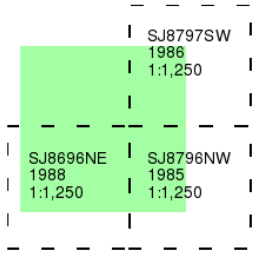
## Additional SIMs

## Published 1985 - 1988

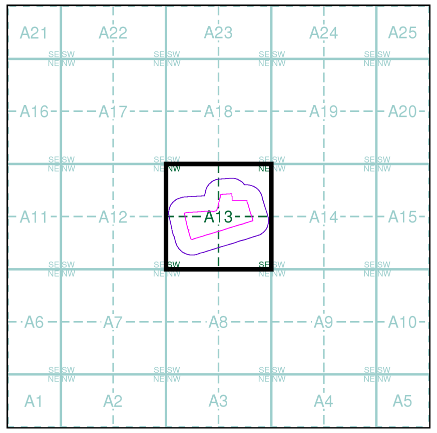
## Source map scale - 1:1,250

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)


SJ8797SW
1986
1:1,250
SJ8696NE
1988
1:1,250
SJ8796NW
1985
1:1,250

## Historical Map - Segment A13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A5

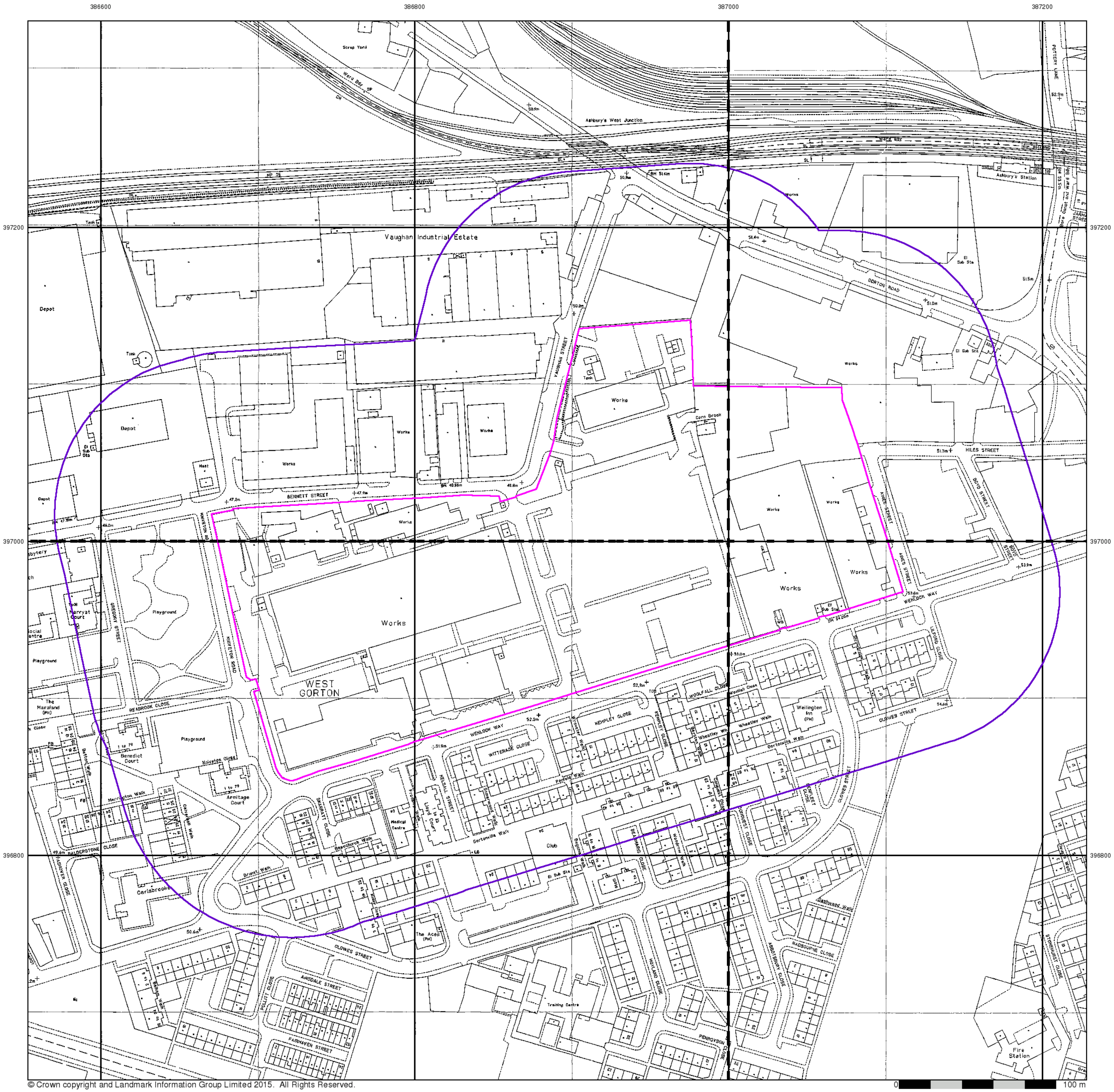
## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 100 |

## Site Details

Site at 386930, 397100

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


386600
386800
387000
387200
397200
397000
396800
Vaughan Industrial Estate
Ashbury's West Junction
Ashbury's Station
Scrap Yard
GORTON ROAD
HILES STREET
BENNETT STREET
VAUGHAN STREET
Corn Brook
Works
Depot
Playground
WEST GORTON
WENLOCK WAY
CLOWES STREET
KEMPLEY CLOSE
WITTERAGE CLOSE
REDBROOK CLOSE
Benedict Court
Armitage Court
Carisbrooke
Medical Centre
Club
The Aces (PH)
Wellington Inn (PH)
Training Centre
Fire Station
AINSDALE STREET
FAIRHAVEN STREET
POTTERY LANE
0
100 m

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# Envirocheck®

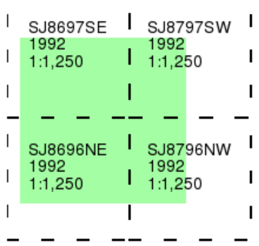
## Large-Scale National Grid Data

## Published 1992

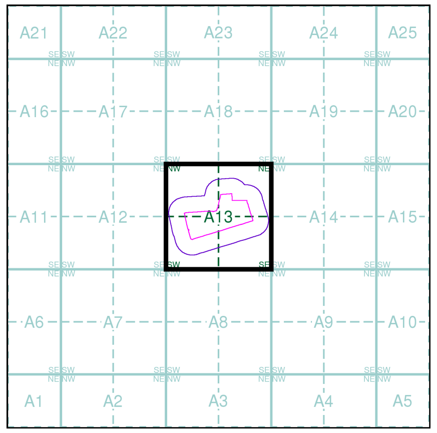
## Source map scale - 1:1,250

'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)


SJ8697SE
1992
1:1,250
SJ8797SW
1992
1:1,250
SJ8696NE
1992
1:1,250
SJ8796NW
1992
1:1,250

## Historical Map - Segment A13


A21
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A5
N

## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 100 |

## Site Details

Site at 386930, 397100

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Information Group

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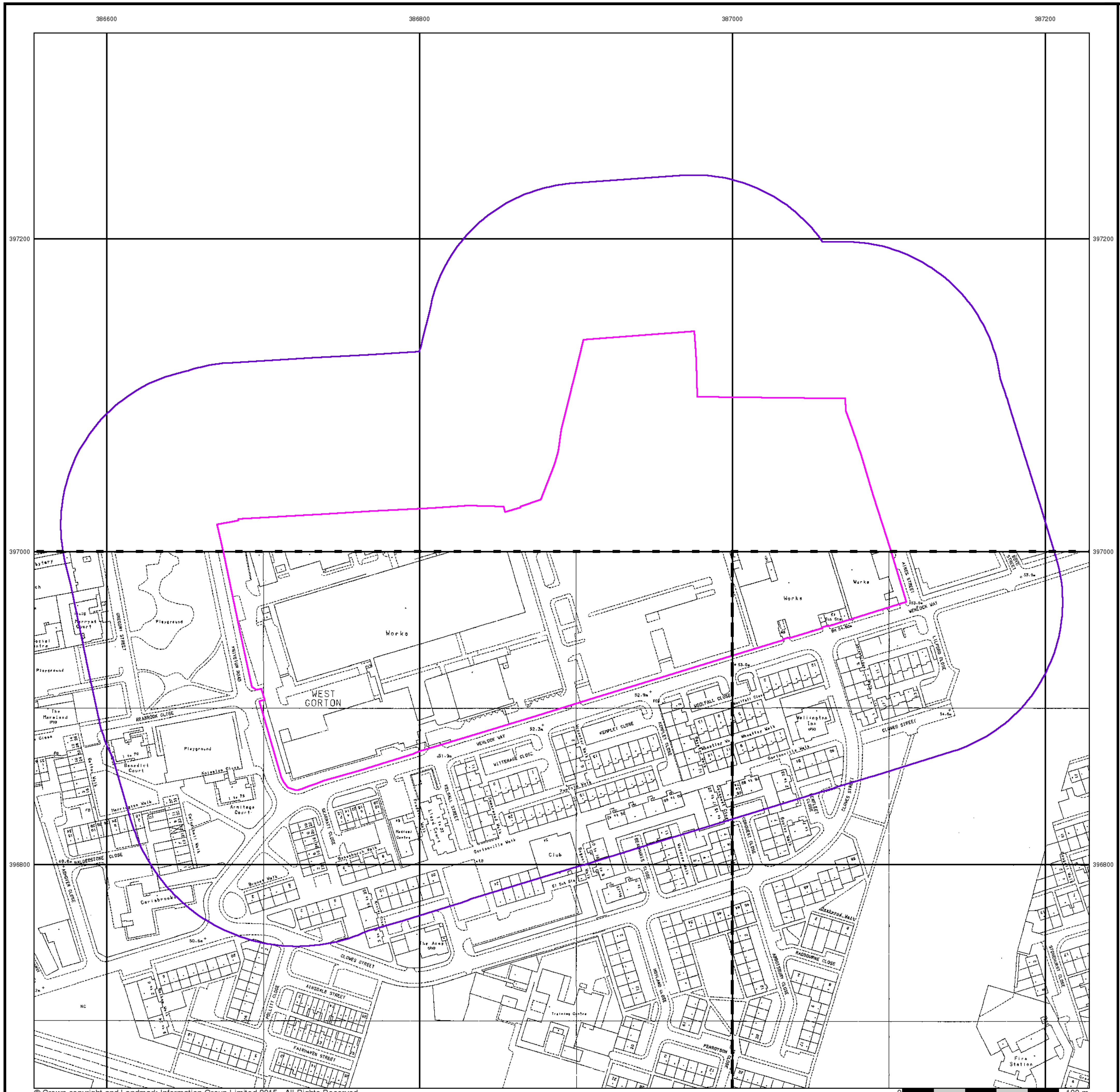
Fax: 0844 844 9951
Web: www.envirocheck.co.uk


386600
386800
387000
387200
397200
397000
396800
Works
WEST GORTON
Playground
Club
Training Centre
Fire Station
CLOWES STREET
WENLOCK WAY
KEMPLEY CLOSE
WOOLFALL CLOSE
0
100 m

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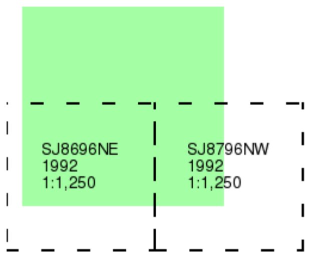
## Additional SIMs

### Published 1992

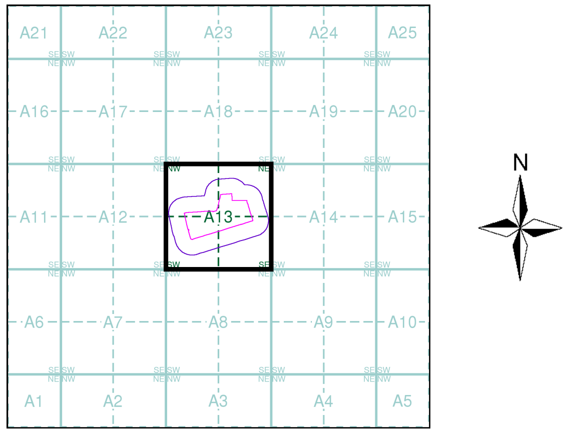
### Source map scale - 1:1,250

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)


SJ8696NE
1992
1:1,250
SJ8796NW
1992
1:1,250

## Historical Map - Segment A13


A21
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A4
A5
N

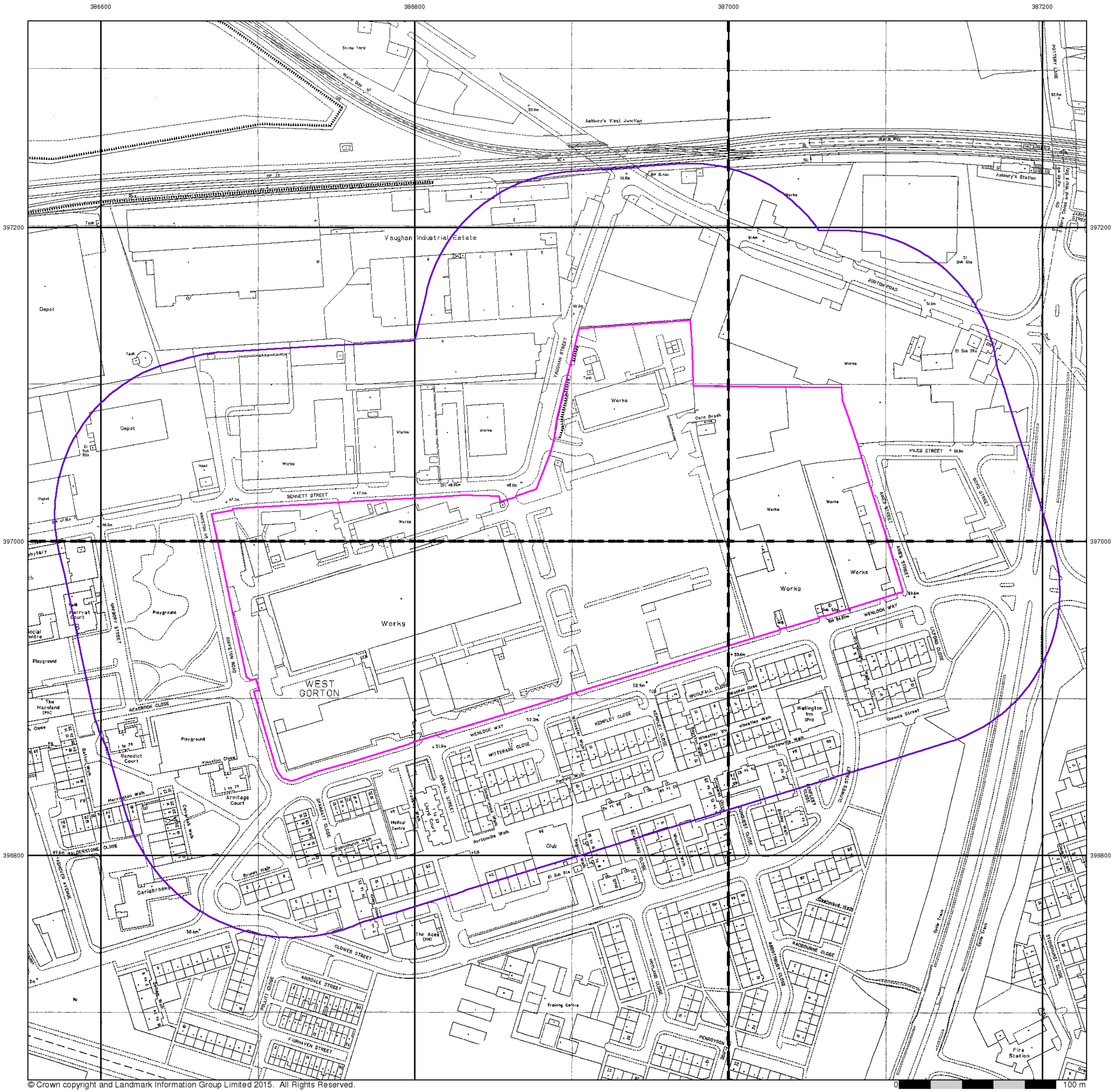
## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 100 |

## Site Details

Site at 386930, 397100

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


386600
386800
387000
387200
397200
397000
396800
Scrap Yard
Ward Bay
Ashbury's West Junction
Ashbury's Station
POTTERY LANE
Vaughan Industrial Estate
Depot
VAUGHAN STREET
GORTON ROAD
Works
El Sub Sta
Gore Brook
MILES STREET
BENNETT STREET
Playground
Marryat Court
Social Centre
The Marsland (PH)
Benedict Court
Armitage Court
WEST GORTON
WENLOCK WAY
WITTERAGE CLOSE
KEMPLEY CLOSE
WOOLFALL CLOSE
Wellington Inn (PH)
Clowes Street
Merrington Walk
Gortonvilla Walk
Medical Centre
Club
The Aces (PH)
CLOWES STREET
AINSDALE STREET
FAIRHAVEN STREET
RADBOURNE CLOSE
Training Centre
Fire Station
Carisbrooke
Cycle Track
0
100 m

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Envirocheck®

## Large-Scale National Grid Data

## Published 1993 - 1995

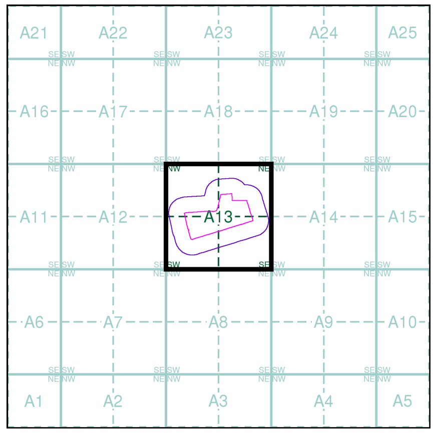
## Source map scale - 1:1,250

'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)

| | |
|---|---|
| 🟩 SJ8697SE<br>1995<br>1:1,250 | 🟩 SJ8797SW<br>1994<br>1:1,250 |
| 🟩 SJ8696NE<br>1993<br>1:1,250 | 🟩 SJ8796NW<br>1993<br>1:1,250 |

## Historical Map - Segment A13


A21
A22
A23
A24
A25
A16
A17
A18
A19
A20
A11
A12
A13
A14
A15
A6
A7
A8
A9
A10
A1
A2
A3
A4
A5

## Order Details

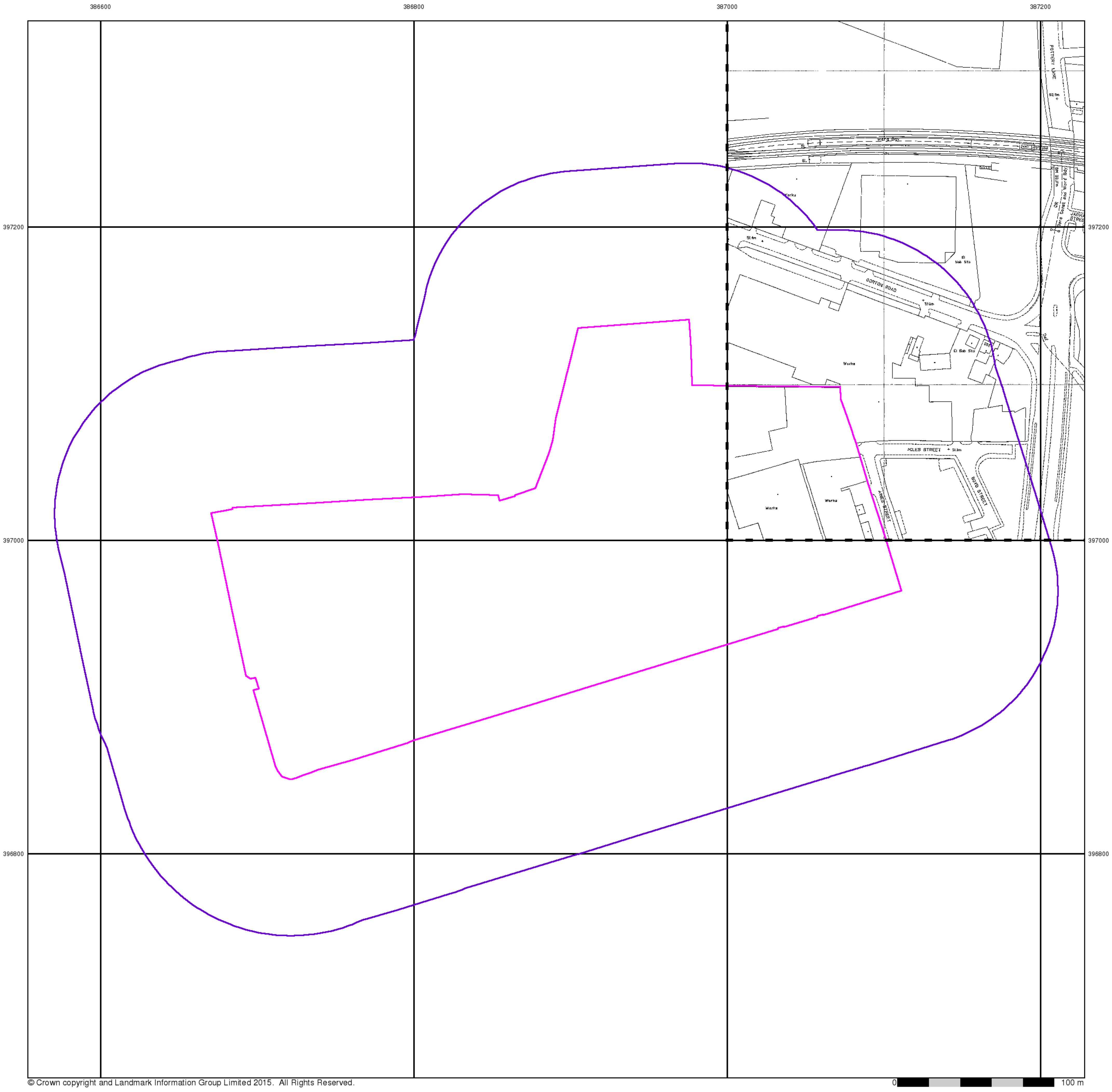
| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 100 |

## Site Details

Site at 386930, 397100

Landmark®
Information Group

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


386600
386800
387000
387200
397200
397000
396800
POTTERY LANE
GORTON ROAD
MILES STREET
BOYD STREET
AMES STREET
Works
El Sub Sta
51.4m
51.0m
51.3m
0
100 m

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# Envirocheck®

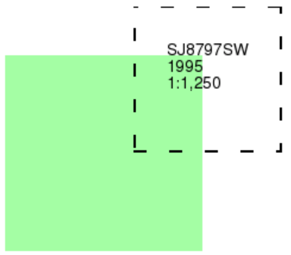
## Large-Scale National Grid Data

### Published 1995

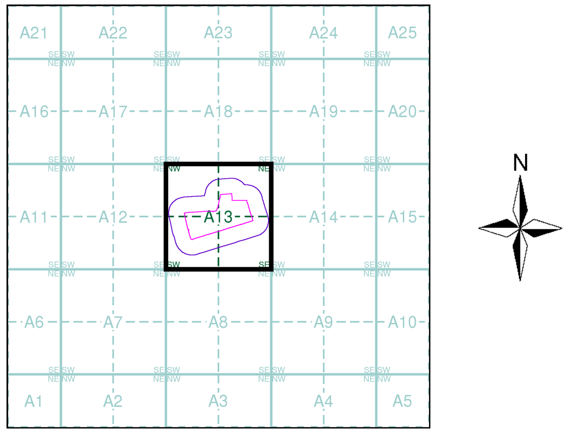
### Source map scale - 1:1,250

'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)


SJ8797SW
1995
1:1,250

## Historical Map - Segment A13


A21
A22
A23
A24
A25
A16
A17
A18
A19
A20
A11
A12
A13
A14
A15
A6
A7
A8
A9
A10
A1
A2
A3
A4
A5
N

## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
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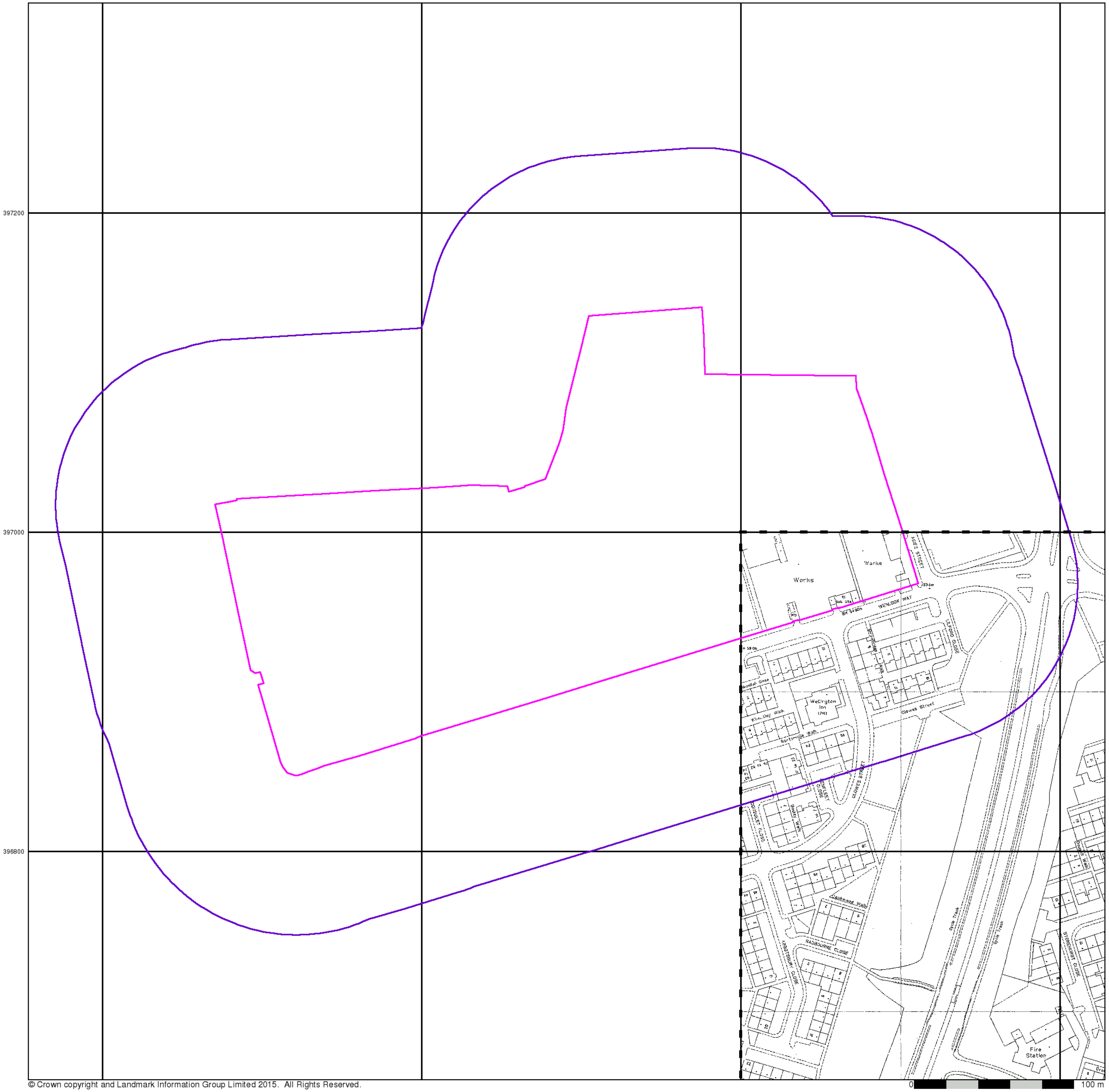
397200
397000
396800
Works
Works
Wellington Inn (PH)
Fire Station
0
100 m

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# Envirocheck®

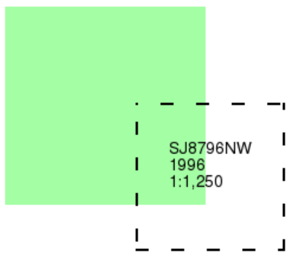
## Large-Scale National Grid Data

**Published 1996**

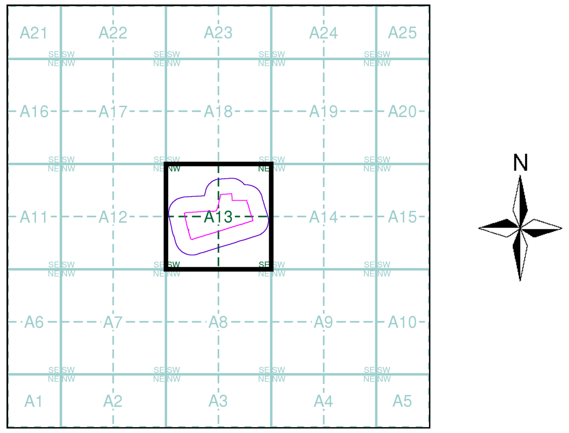
**Source map scale - 1:1,250**

'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)


SJ8796NW
1996
1:1,250

## Historical Map - Segment A13


A21
A22
A23
A24
A25
A16
A17
A18
A19
A20
A11
A12
A13
A14
A15
A6
A7
A8
A9
A10
A1
A2
A3
A4
A5
N

## Order Details

| | |
|---|---|
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| Customer Ref: | 2913 |
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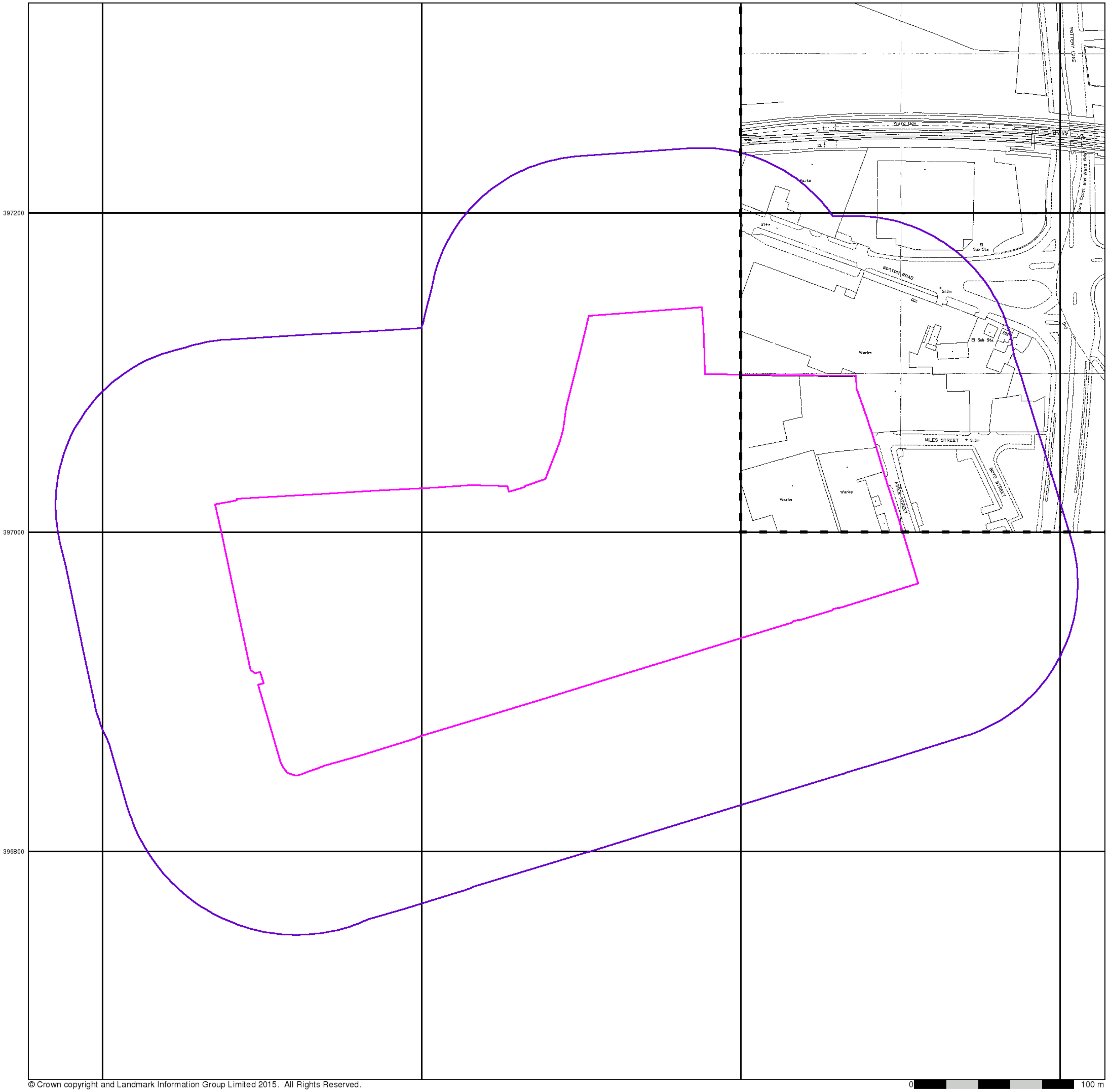
397200
397000
396800
POTTERY LANE
Ward Bdy
SL
Works
Boro Const and Ward Bdy
El Sub Sta
GORTON ROAD
51.0m
Works
El Sub Sta
MILES STREET
51.0m
BOYD STREET
AMES STREET
Works
Works
0
100 m

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# Envirocheck®

## Large-Scale National Grid Data

## Published 1996

## 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.

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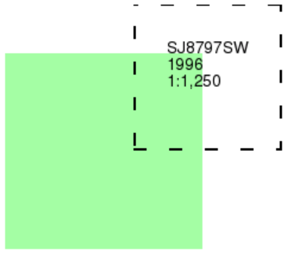
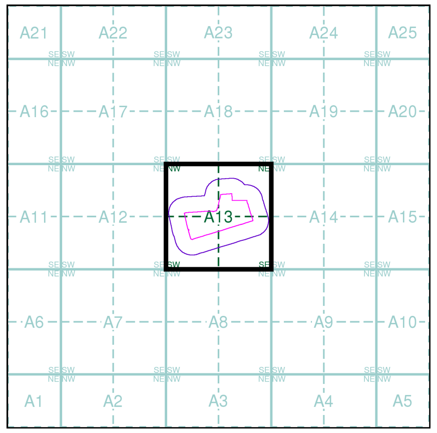

SJ8797SW
1996
1:1,250

## Historical Map - Segment A13


A21
A22
A23
A24
A25
A16
A17
A18
A19
A20
A11
A12
A13
A14
A15
A6
A7
A8
A9
A10
A1
A2
A3
A4
A5
N

## Order Details

| | |
|---|---|
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Site at 386930, 397100

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Information Group

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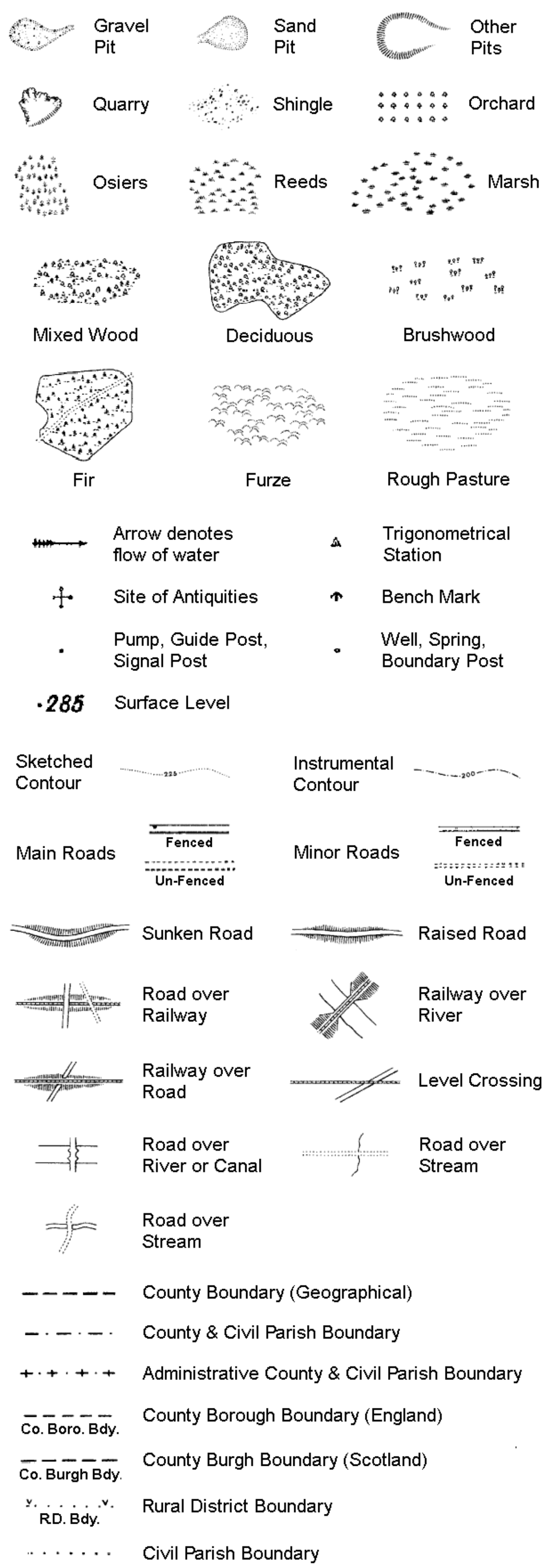
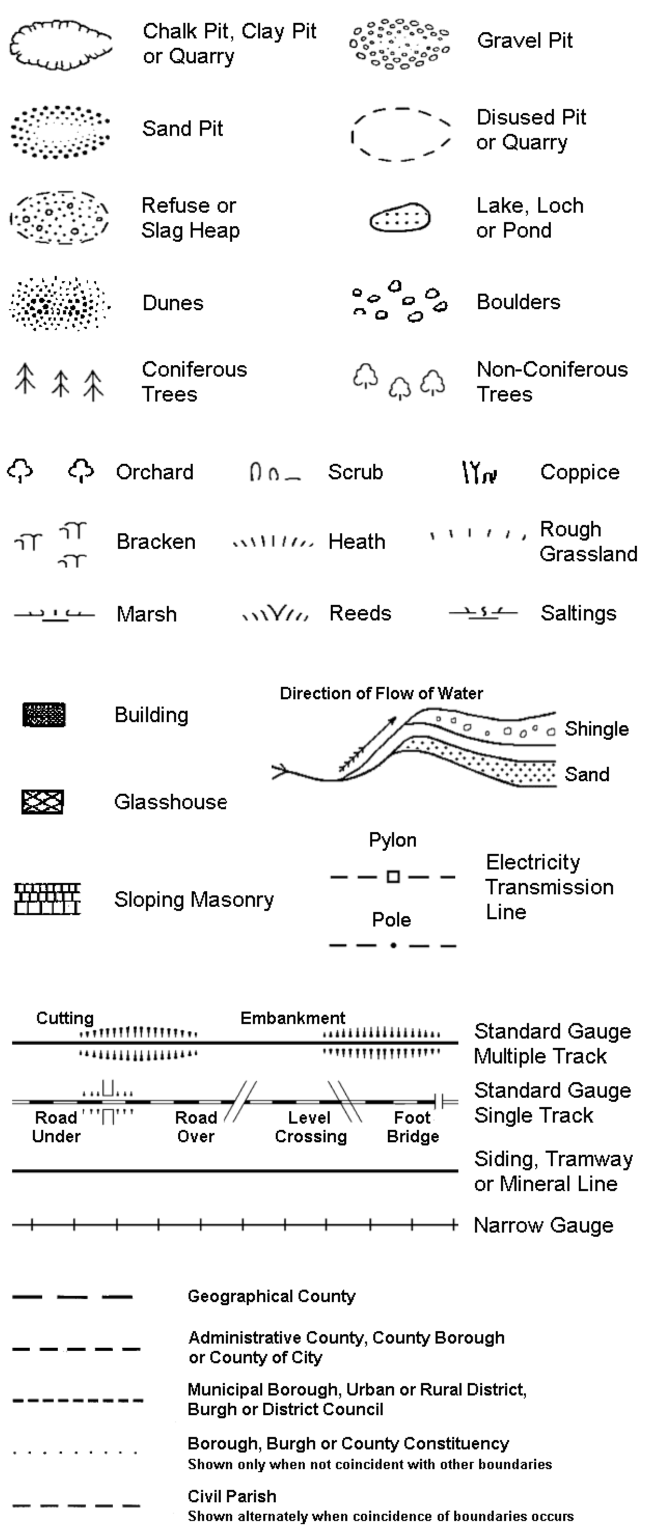
| Fax: | 0844 844 9951 |
| Web: | www.envirocheck.co.uk |

# Historical Mapping Legends

## Ordnance Survey County Series 1:10,560

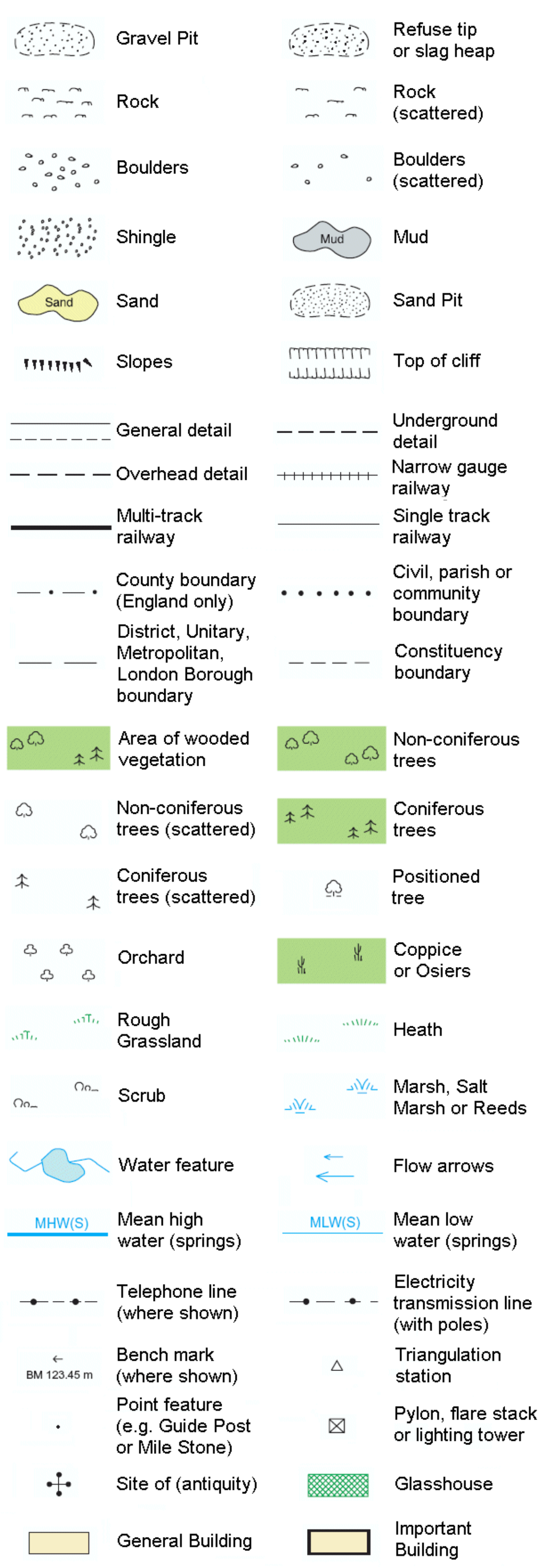

Gravel Pit
Sand Pit
Other Pits
Quarry
Shingle
Orchard
Osiers
Reeds
Marsh
Mixed Wood
Deciduous
Brushwood
Fir
Furze
Rough Pasture
Arrow denotes flow of water
Trigonometrical Station
Site of Antiquities
Bench Mark
Pump, Guide Post, Signal Post
Well, Spring, Boundary Post
·285
Surface Level
Sketched Contour
Instrumental Contour
Main Roads
Fenced
Un-Fenced
Minor Roads
Fenced
Un-Fenced
Sunken Road
Raised Road
Road over Railway
Railway over River
Railway over Road
Level Crossing
Road over River or Canal
Road over Stream
Road over Stream
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
Co. Boro. Bdy.
County Borough Boundary (England)
Co. Burgh Bdy.
County Burgh Boundary (Scotland)
RD. Bdy.
Rural District Boundary
Civil Parish Boundary

## Ordnance Survey Plan 1:10,000


Chalk Pit, Clay Pit or Quarry
Gravel Pit
Sand Pit
Disused Pit or Quarry
Refuse or Slag Heap
Lake, Loch or Pond
Dunes
Boulders
Coniferous Trees
Non-Coniferous Trees
Orchard
Scrub
Coppice
Bracken
Heath
Rough Grassland
Marsh
Reeds
Saltings
Building
Direction of Flow of Water
Shingle
Sand
Glasshouse
Pylon
Electricity Transmission Line
Pole
Sloping Masonry
Cutting
Embankment
Standard Gauge Multiple Track
Road Under
Road Over
Level Crossing
Foot Bridge
Standard Gauge Single Track
Siding, Tramway or Mineral Line
Narrow Gauge
Geographical County
Administrative County, County Borough or County of City
Municipal Borough, Urban or Rural District, Burgh or District Council
Borough, Burgh or County Constituency
Shown only when not coincident with other boundaries
Civil Parish
Shown alternately when coincidence of boundaries occurs

| | | | |
|---|---|---|---|
| BP, BS | Boundary Post or Stone | Pol Sta | Police Station |
| Ch | Church | PO | Post Office |
| CH | Club House | PC | Public Convenience |
| F E Sta | Fire Engine Station | PH | Public House |
| FB | Foot Bridge | SB | Signal Box |
| Fn | Fountain | Spr | Spring |
| GP | Guide Post | TCB | Telephone Call Box |
| MP | Mile Post | TCP | Telephone Call Post |
| MS | Mile Stone | W | Well |

## 1:10,000 Raster Mapping

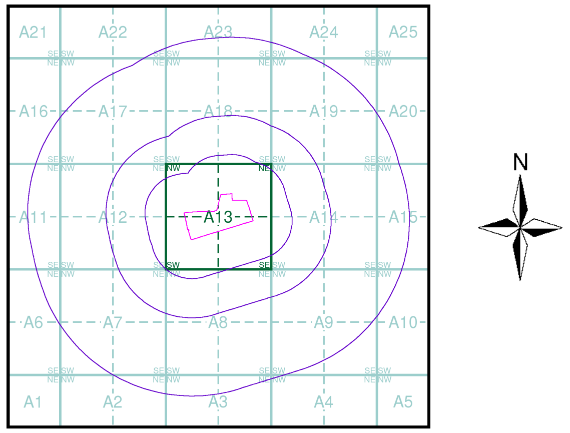

Gravel Pit
Refuse tip or slag heap
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Shingle
Mud
Mud
Sand
Sand
Sand Pit
Slopes
Top of cliff
General detail
Underground detail
Overhead detail
Narrow gauge railway
Multi-track railway
Single track railway
County boundary (England only)
Civil, parish or community boundary
District, Unitary, Metropolitan, London Borough boundary
Constituency boundary
Area of wooded vegetation
Non-coniferous trees
Non-coniferous trees (scattered)
Coniferous trees
Coniferous trees (scattered)
Positioned tree
Orchard
Coppice or Osiers
Rough Grassland
Heath
Scrub
Marsh, Salt Marsh or Reeds
Water feature
Flow arrows
MHW(S)
Mean high water (springs)
MLW(S)
Mean low water (springs)
Telephone line (where shown)
Electricity transmission line (with poles)
BM 123.45 m
Bench mark (where shown)
Triangulation station
Point feature (e.g. Guide Post or Mile Stone)
Pylon, flare stack or lighting tower
Site of (antiquity)
Glasshouse
General Building
Important Building

Envirocheck®

## 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 |
| Cheshire | 1:10,560 | 1899 | 6 |
| Lancashire And Furness | 1:10,560 | 1909 | 7 |
| Cheshire | 1:10,560 | 1911 | 8 |
| Lancashire And Furness | 1:10,560 | 1923 | 9 |
| Lancashire And Furness | 1:10,560 | 1932 - 1933 | 10 |
| Cheshire | 1:10,560 | 1938 | 11 |
| Lancashire And Furness | 1:10,560 | 1938 | 12 |
| Ordnance Survey Plan | 1:10,000 | 1956 | 13 |
| Ordnance Survey Plan | 1:10,000 | 1968 | 14 |
| Manchester | 1:25,000 | 1975 | 15 |
| Ordnance Survey Plan | 1:10,000 | 1981 | 16 |
| Ordnance Survey Plan | 1:10,000 | 1987 | 17 |
| Ordnance Survey Plan | 1:10,000 | 1993 | 18 |
| 10K Raster Mapping | 1:10,000 | 2006 | 19 |
| VectorMap Local | 1:10,000 | 2015 | 20 |

## Historical Map - Slice A


A21
A22
A23
A24
A25
A16
A17
A18
A19
A20
A11
A12
A13
A14
A15
A6
A7
A8
A9
A10
A1
A2
A3
A4
A5
N

## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

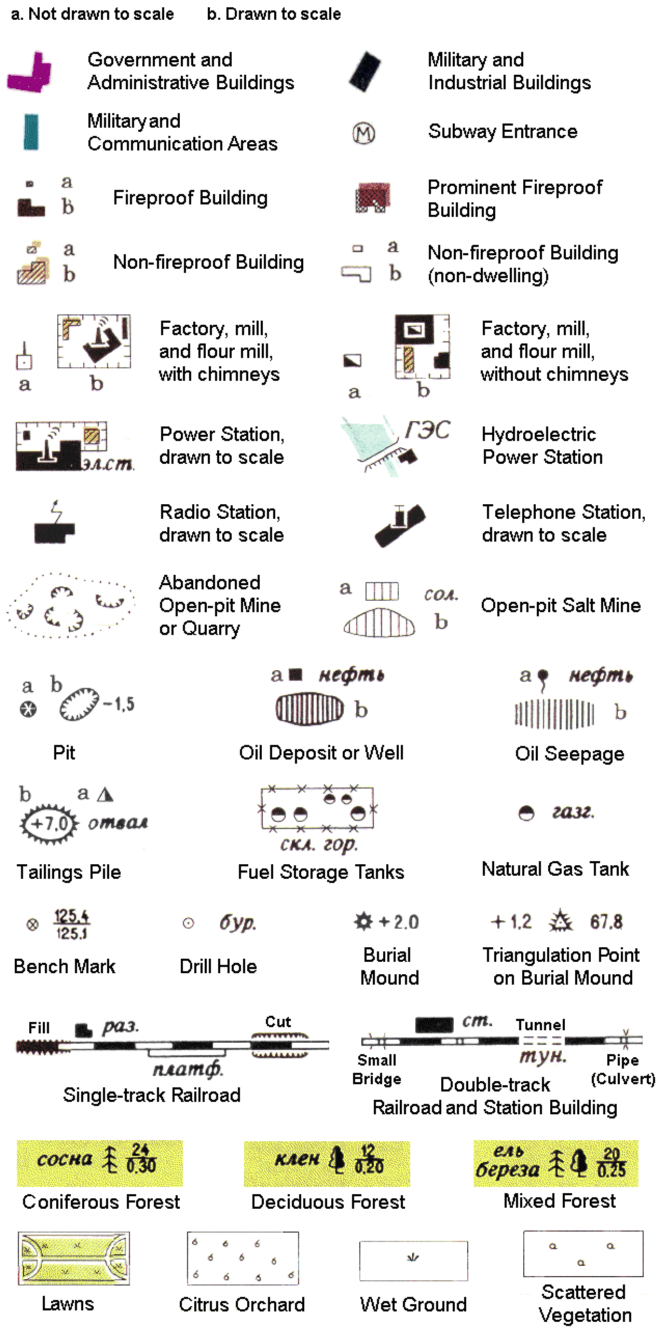
Site at 386930, 397100

Landmark Information Group

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

# Russian Military Mapping Legends

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


a. Not drawn to scale
b. Drawn to scale
Government and Administrative Buildings
Military and Industrial Buildings
Military and Communication Areas
Subway Entrance
Fireproof Building
Prominent Fireproof Building
Non-fireproof Building
Non-fireproof Building (non-dwelling)
Factory, mill, and flour mill, with chimneys
Factory, mill, and flour mill, without chimneys
Power Station, drawn to scale
Hydroelectric Power Station
Radio Station, drawn to scale
Telephone Station, drawn to scale
Abandoned Open-pit Mine or Quarry
Open-pit Salt Mine
Pit
Oil Deposit or Well
Oil Seepage
Tailings Pile
Fuel Storage Tanks
Natural Gas Tank
Bench Mark
Drill Hole
Burial Mound
Triangulation Point on Burial Mound
Single-track Railroad
Double-track Railroad and Station Building
Coniferous Forest
Deciduous Forest
Mixed Forest
Lawns
Citrus Orchard
Wet Ground
Scattered Vegetation

| | |
|---|---|
| 243,8 | Values for prominent elevations |
| 186,0 | Numbers for spot elevations, depth soundings, contour lines, etc. |
| 0,2 | Velocity of the current, width of river bed, depth of river |
| 180/12 180/12 | Fractional terms: length and capacity of bridges; depth of fords and condition of the river bottom; height of forest and the diameter of trees |

**Russian Alphabet** (For reference and phonetic interpretation of map text)

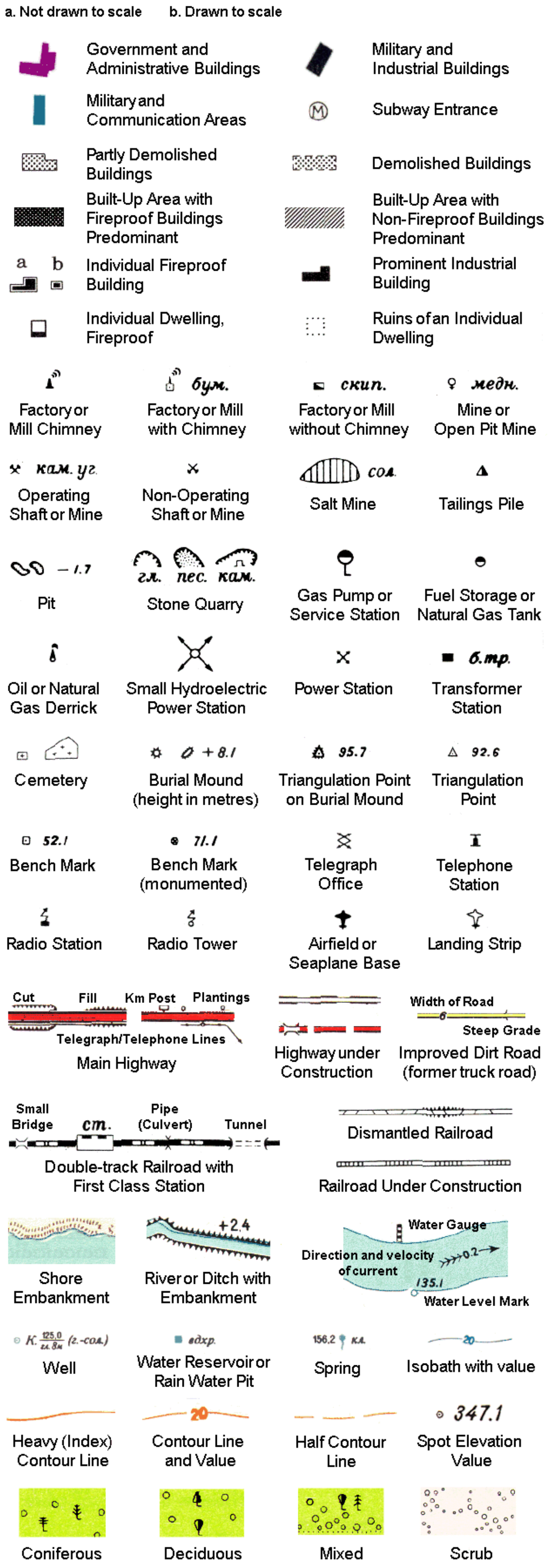
А а (A)
Б б (B)
В в (V)
Г г (G)
Д д (D)
Е е (E)
Ё ё (YO)
Ж ж (ZH)

З з (Z)
И и (I)
Й й (Y)
К к (K)
Л л (L)
М м (M)
Н н (N)
О о (O)

П п (P)
Р р (R)
С с (S)
Т т (T)
У у (U)
Ф ф (F)
Х х (KH)
Ц ц (TS)

Ч ч (CH)
Ш ш (SH)
Щ щ (SHCH)
ъ (-)
ы (Y)
ь (')
Э э (E)
Ю ю (YU or IU)
Я я (YA or IA)

## 1:25,000 mapping


a. Not drawn to scale
b. Drawn to scale
Government and Administrative Buildings
Military and Industrial Buildings
Military and Communication Areas
Subway Entrance
Partly Demolished Buildings
Demolished Buildings
Built-Up Area with Fireproof Buildings Predominant
Built-Up Area with Non-Fireproof Buildings Predominant
Individual Fireproof Building
Prominent Industrial Building
Individual Dwelling, Fireproof
Ruins of an Individual Dwelling
Factory or Mill Chimney
Factory or Mill with Chimney
Factory or Mill without Chimney
Mine or Open Pit Mine
Operating Shaft or Mine
Non-Operating Shaft or Mine
Salt Mine
Tailings Pile
Pit
Stone Quarry
Gas Pump or Service Station
Fuel Storage or Natural Gas Tank
Oil or Natural Gas Derrick
Small Hydroelectric Power Station
Power Station
Transformer Station
Cemetery
Burial Mound (height in metres)
Triangulation Point on Burial Mound
Triangulation Point
Bench Mark
Bench Mark (monumented)
Telegraph Office
Telephone Station
Radio Station
Radio Tower
Airfield or Seaplane Base
Landing Strip
Cut
Fill
Km Post
Plantings
Telegraph/Telephone Lines
Main Highway
Highway under Construction
Width of Road
Steep Grade
Improved Dirt Road (former truck road)
Small Bridge
Pipe (Culvert)
Tunnel
Double-track Railroad with First Class Station
Dismantled Railroad
Railroad Under Construction
Shore Embankment
River or Ditch with Embankment
Water Gauge
Direction and velocity of current
Water Level Mark
Well
Water Reservoir or Rain Water Pit
Spring
Isobath with value
Heavy (Index) Contour Line
Contour Line and Value
Half Contour Line
Spot Elevation Value
Coniferous
Deciduous
Mixed
Scrub

## Key to Numbers on Mapping

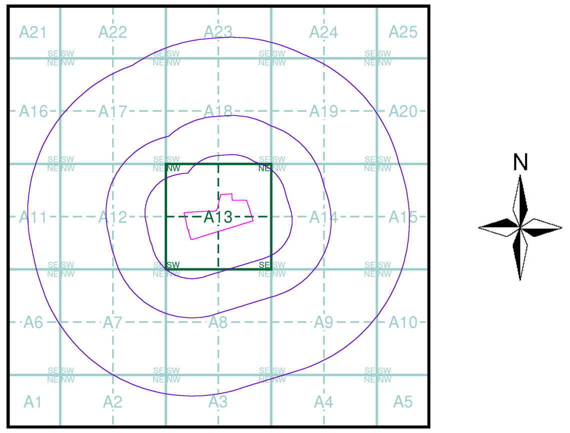
### SJ89_Manchester

| No. | Description |
|---|---|
| 19 | Depot (Bus) |
| 25 | Depot (Railway) |
| 27 | Depot (Railway) |
| 47 | Factory (Cars) |
| 48 | Factory (Cars) |
| 103 | Factory (Machinery) |
| 139 | Foundry (Cast Iron) |
| 159 | Police Station/Headquarters |
| 196 | Railway Station (Freight) |

## 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 |
| Cheshire | 1:10,560 | 1899 | 6 |
| Lancashire And Furness | 1:10,560 | 1909 | 7 |
| Cheshire | 1:10,560 | 1911 | 8 |
| Lancashire And Furness | 1:10,560 | 1923 | 9 |
| Lancashire And Furness | 1:10,560 | 1932 - 1933 | 10 |
| Cheshire | 1:10,560 | 1938 | 11 |
| Lancashire And Furness | 1:10,560 | 1938 | 12 |
| Ordnance Survey Plan | 1:10,000 | 1956 | 13 |
| Ordnance Survey Plan | 1:10,000 | 1968 | 14 |
| Manchester | 1:25,000 | 1975 | 15 |
| Ordnance Survey Plan | 1:10,000 | 1981 | 16 |
| Ordnance Survey Plan | 1:10,000 | 1987 | 17 |
| Ordnance Survey Plan | 1:10,000 | 1993 | 18 |
| 10K Raster Mapping | 1:10,000 | 2006 | 19 |
| VectorMap Local | 1:10,000 | 2015 | 20 |

## Russian Map - Slice A


A21
A22
A23
A24
A25
A16
A17
A18
A19
A20
A11
A12
A13
A14
A15
A6
A7
A8
A9
A10
A1
A2
A3
A4
A5
N

## Order Details

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National Grid Reference: 386890, 396990
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Search Buffer (m): 1000

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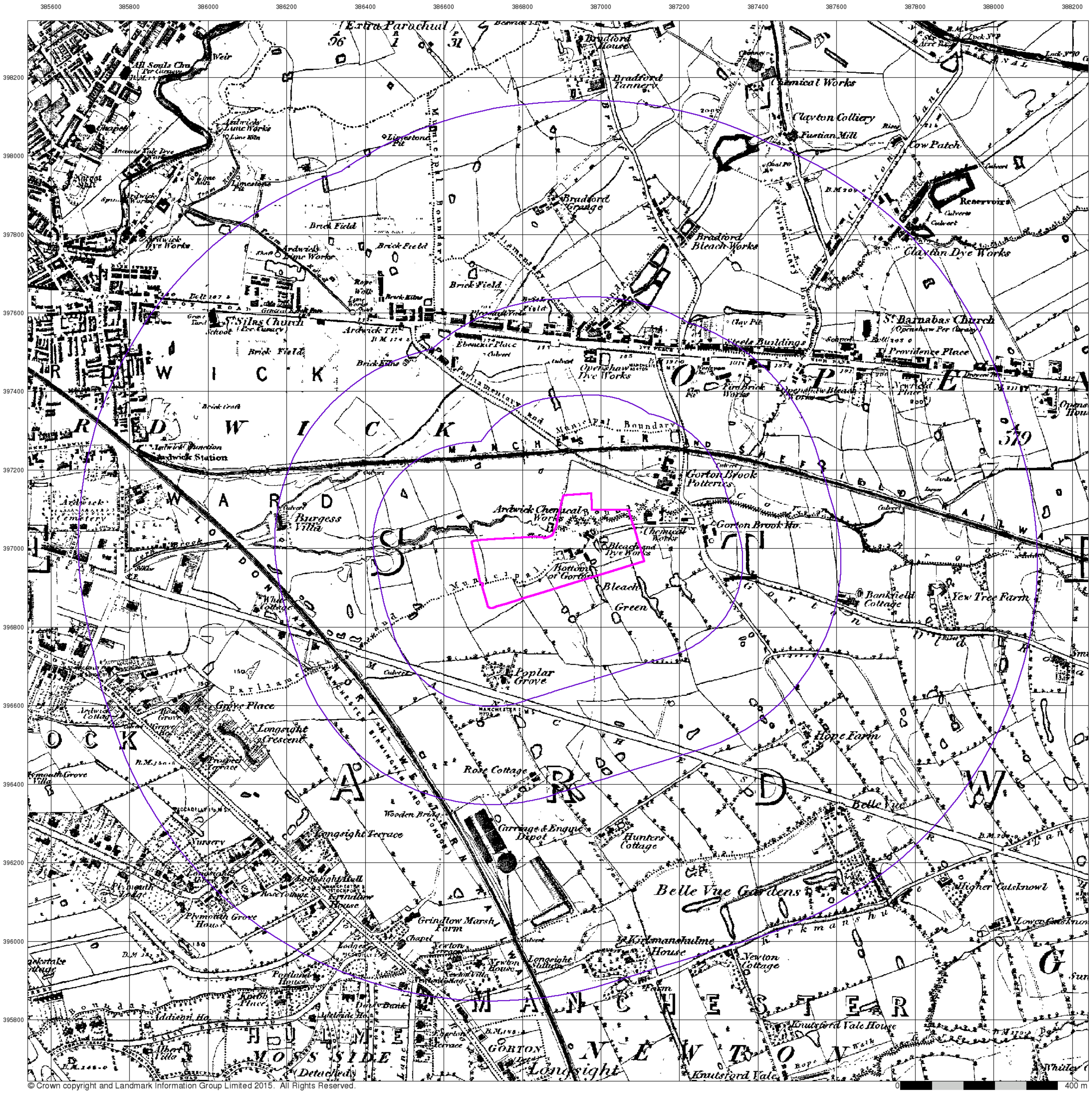
Fax: 0844 844 9951
Web: www.envirocheck.co.uk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Extra Parochial
All Souls Chu
Weir
Bradford House
Bradford Tannery
Chemical Works
Clayton Colliery
Fustian Mill
Cow Patch
Ardwick Lime Works
Limestone Pit
Reservoirs
Bradford Grange
Bradford Bleach Works
Clayton Dye Works
Brick Field
Ardwick Lime Works
Ardwick Dye Works
St Silas Church
Ardwick T.P.
Ebenezer Place
Openshaw Dye Works
Steele Buildings
St Barnabas Church
Providence Place
Fire Brick Works
Openshaw Bleach Works
ARDWICK
OPENSHAW
Ardwick Junction
Ardwick Station
MANCHESTER
Municipal Boundary
Gorton Brook Potteries
Burgess Villa
Ardwick Chemical Works
Gorton Brook Ho.
Chemical Works
Bleach and Dye Works
Hottentot or Gorton
Bleach Green
Bankfield Cottage
Yew Tree Farm
Poplar Grove
Grove Place
Longsight Crescent
Hope Farm
Rose Cottage
Belle Vue
Carriage & Engine Depot
Hunters Cottage
Longsight Terrace
Belle Vue Gardens
Higher Catsknowl
Grindlow Marsh Farm
Kirkmanshulme House
Newton Cottage
Longsight Station
Plymouth Grove
Plymouth Grove House
Knutsford Vale House
MOSS SIDE
GORTON
Longsight
Knutsford Vale
0
400 m

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**Envirocheck®**

## Lancashire And Furness

## Published 1848

## Source map scale - 1:10,560

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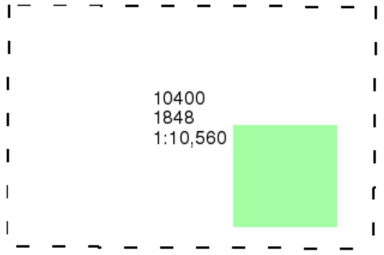
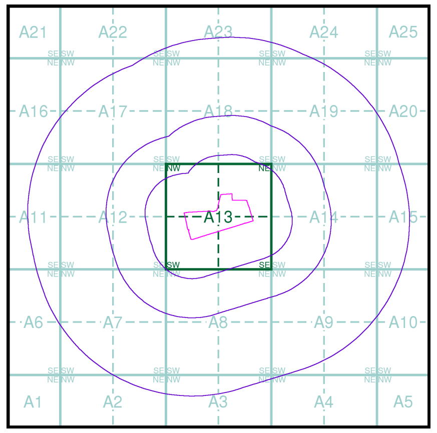
## Map Name(s) and Date(s)


10400
1848
1:10,560

## Historical Map - Slice A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## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

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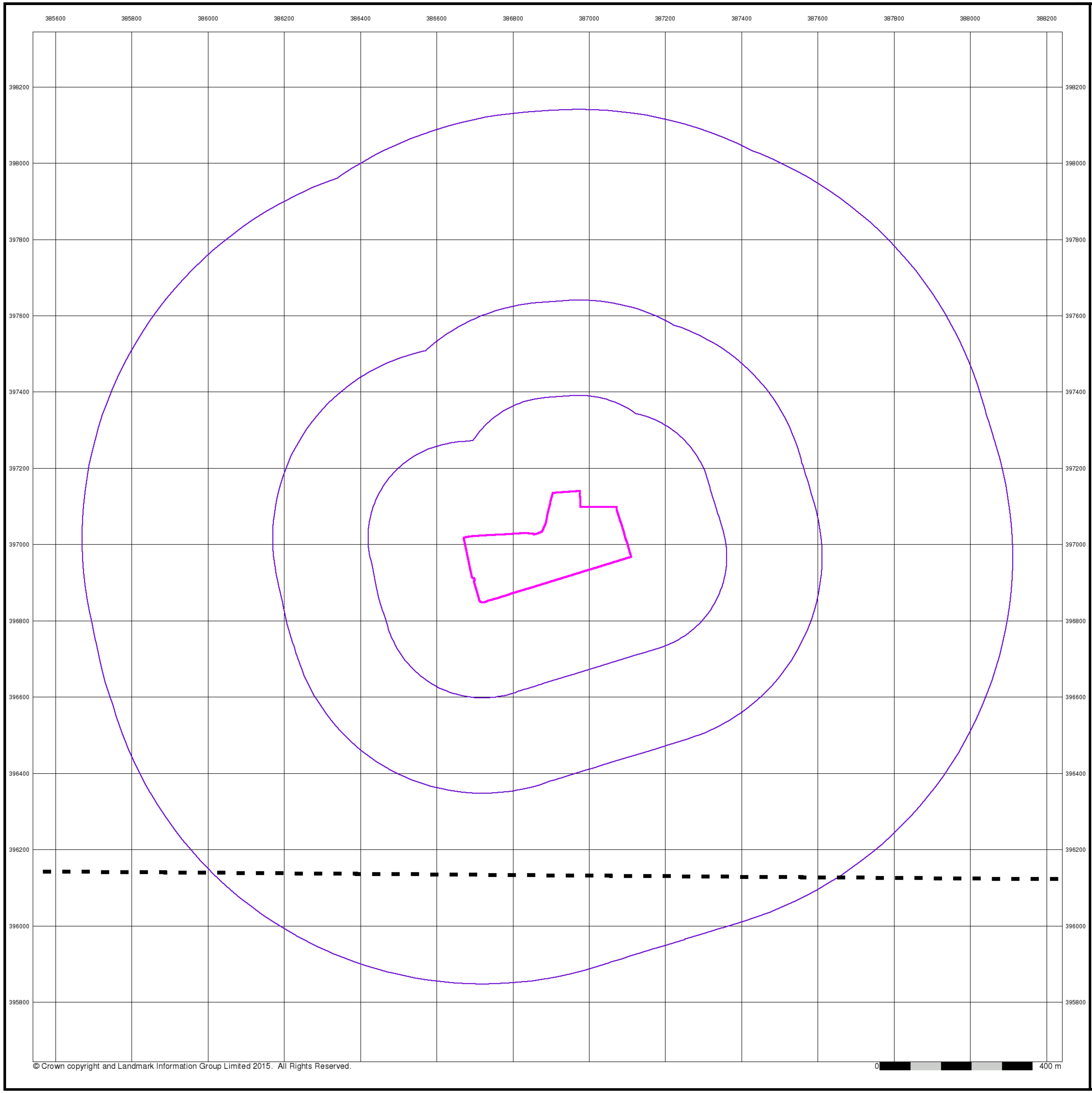
| Fax: | 0844 844 9951 |
| Web: | www.envirocheck.co.uk |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**Envirocheck®**

## Cheshire

## Published 1882

## Source map scale - 1:10,560

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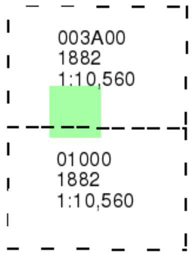
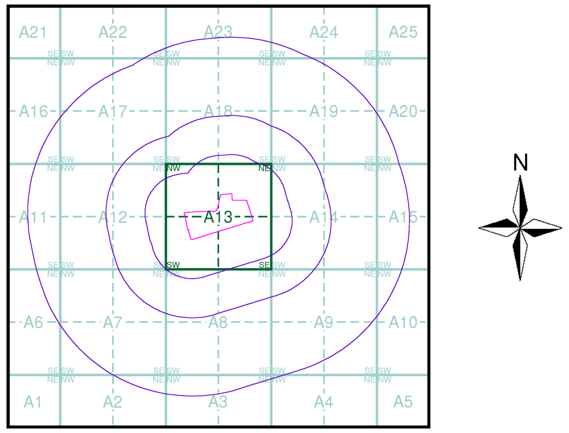
## Map Name(s) and Date(s)


003A00
1882
1:10,560
01000
1882
1:10,560

## Historical Map - Slice A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## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

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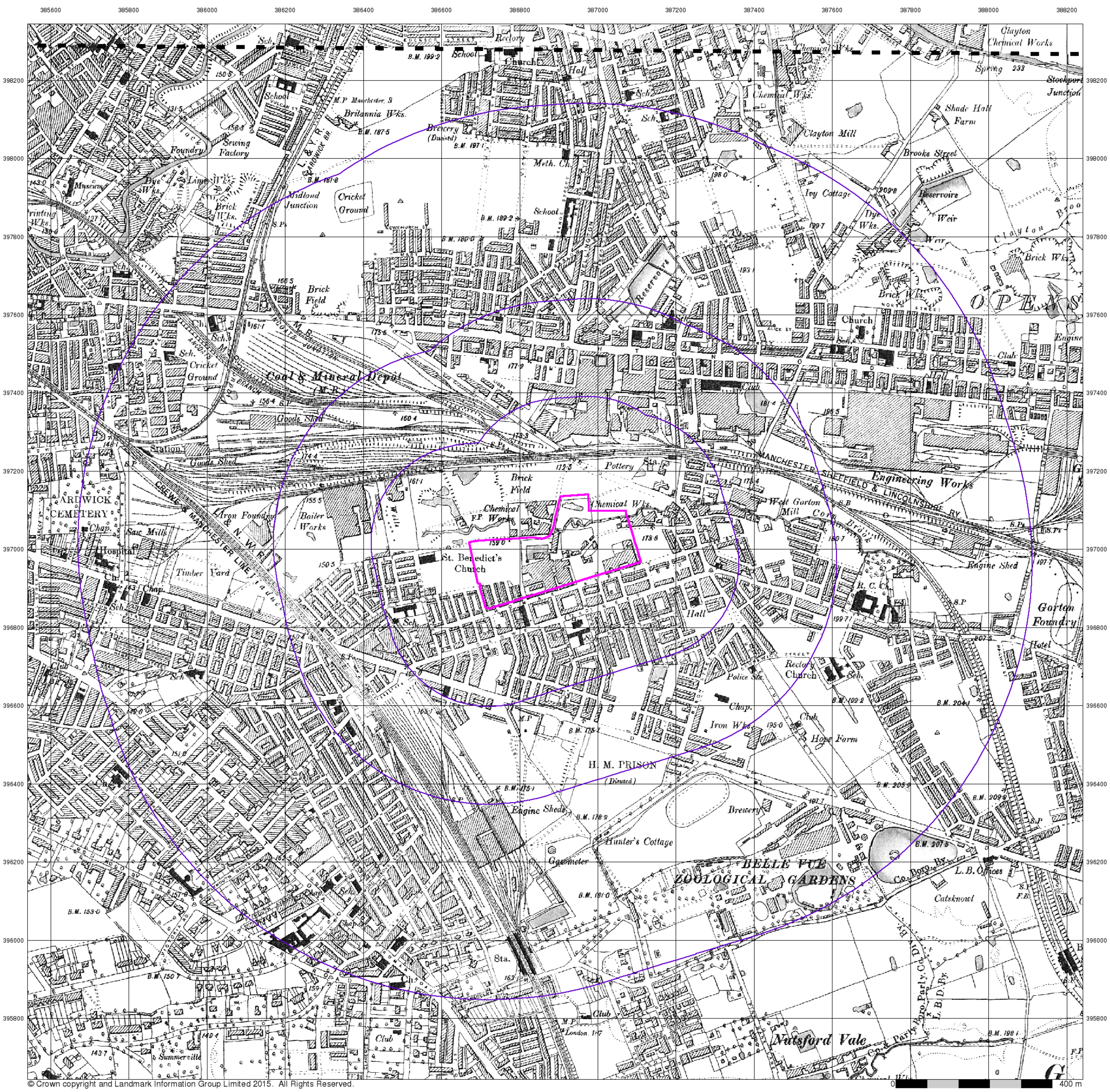
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Clayton Chemical Works
Rectory
School
Church
Hall
Sch.
Stockport Junction
Spring
Shade Hall Farm
Clayton Mill
Chemical Wks.
Brooks Street
Reservoirs
Weir
Ivy Cottage
Dye Wks.
Clayton
Brick Wks.
Brick Wks.
OPENSHAW
Church
Engine
Club
M.P. Manchester 3
Britannia Wks.
Brewery (Disused)
Meth. Ch.
School
Sewing Factory
Foundry
Museum
Dye Wks.
Lime Wks.
Brick Wks.
Printing Wks.
Midland Junction
Cricket Ground
Brick Field
Cricket Ground
Coal & Mineral Depot (M.R.)
Goods Shed
Goods Shed
Station
ARDWICK CEMETERY
Chap.
Saw Mill
Hospital
Timber Yard
Iron Foundry
Boiler Works
Brick Field
Chemical Works
F.P.
Pottery
Sta.
Chemical Wks.
St. Benedict's Church
MANCHESTER SHEFFIELD & LINCOLNSHIRE RY.
Engineering Works
West Gorton Mill
Corn
Engine Shed
R.C. Ch.
Gorton Foundry
Hotel
Hall
Sch.
Rectory Church
Police Sta.
Chap.
Iron Wks.
Club
Hope Farm
H. M. PRISON (Disused)
Engine Sheds
Brewery
Hunter's Cottage
Gasometer
BELLE VUE ZOOLOGICAL GARDENS
Co. Boro. Ry.
L.B. Offices
Catsknowl
Sta.
Club
Club
Summerville
Nutsford Vale
Chap.
Sch.
CREWE & MANCHESTER LINE L. & N. W. R.
L. & Y. R. ARDWICK BR.
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400 m

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## Lancashire And Furness

## Published 1894

## Source map scale - 1:10,560

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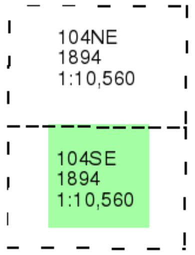
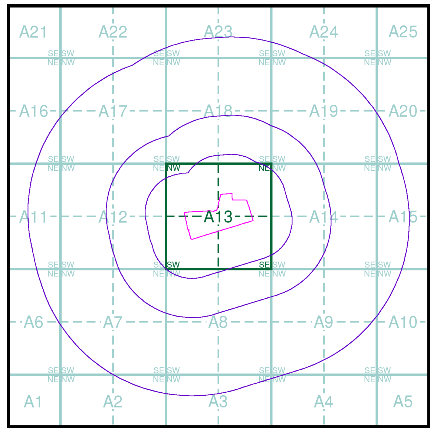
## Map Name(s) and Date(s)


104NE
1894
1:10,560
104SE
1894
1:10,560

## Historical Map - Slice A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## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

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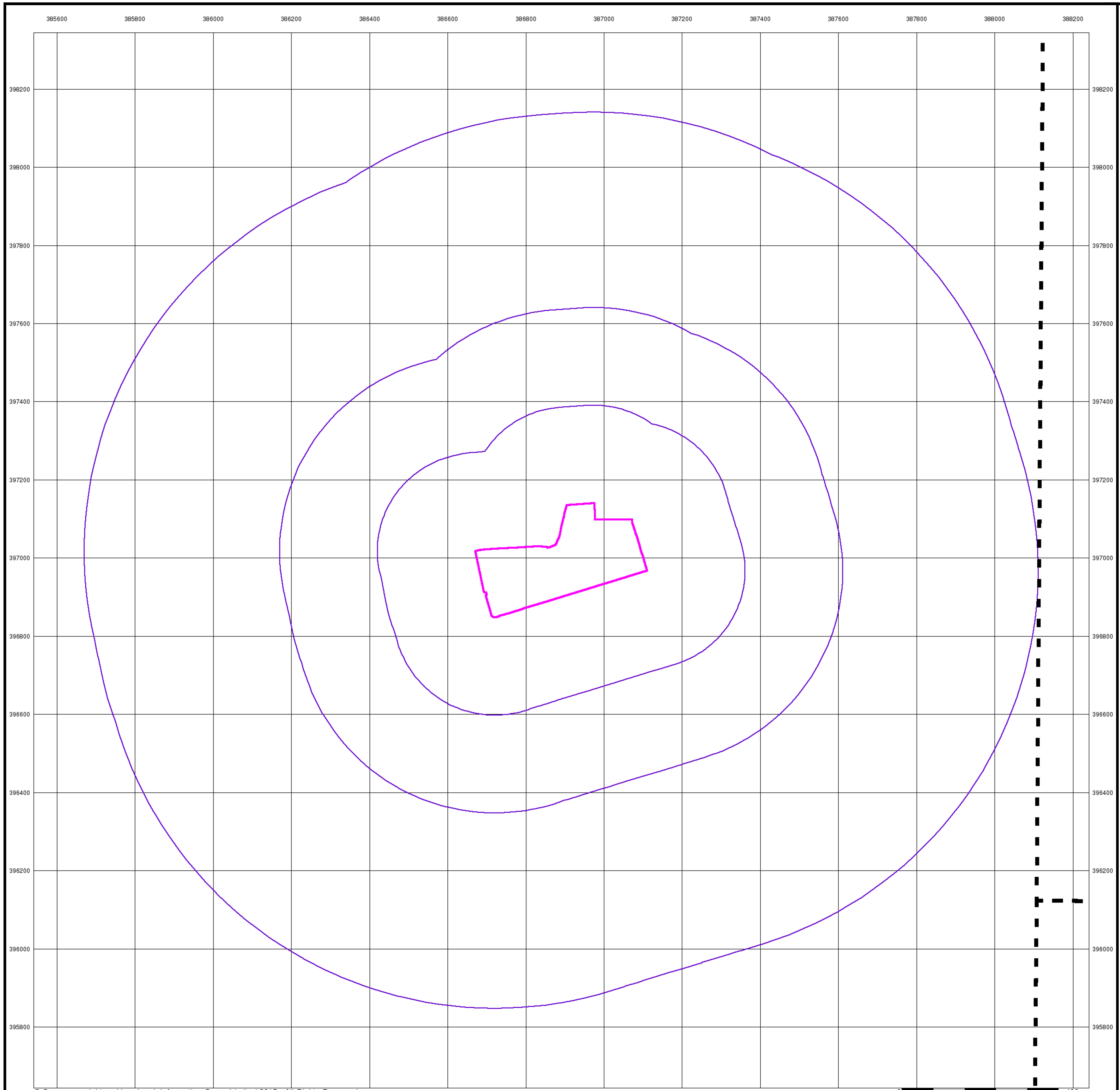
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# Envirocheck®

## Cheshire

## Published 1899

## Source map scale - 1:10,560

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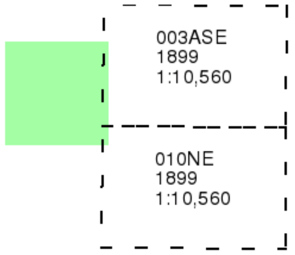
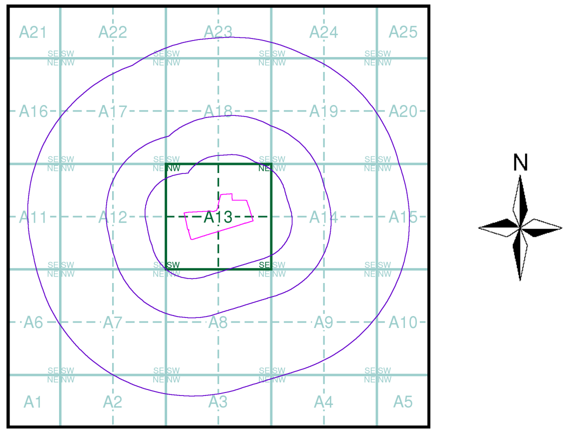
## Map Name(s) and Date(s)


003ASE
1899
1:10,560
010NE
1899
1:10,560

## Historical Map - Slice A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## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

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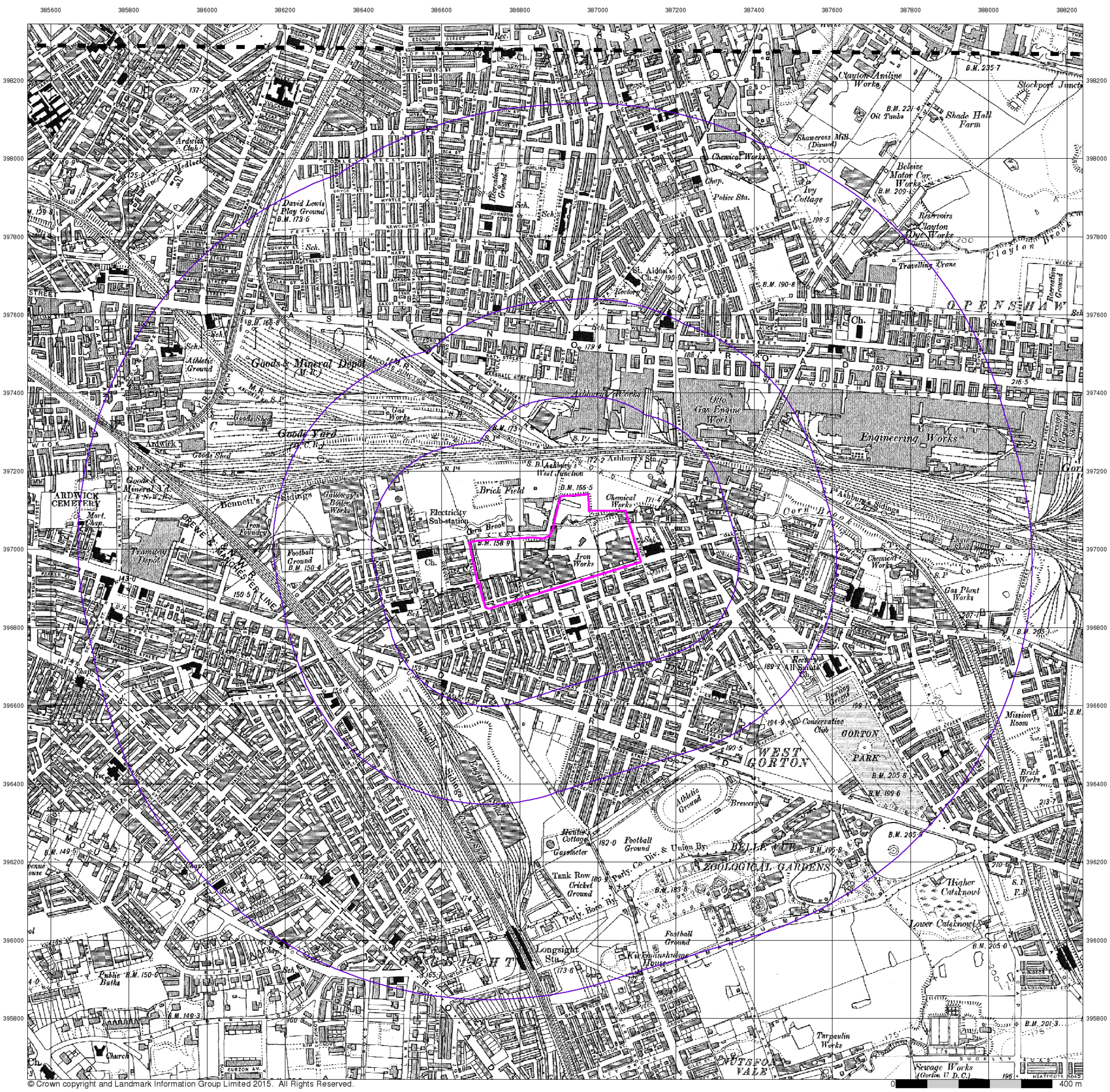
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Clayton Aniline Works
Oil Tanks
Shade Hall Farm
Stockport Junct.
Chemical Works
Belsize Motor Car Works
Clayton Dye Works
Travelling Crane
Ardwick Club
David Lewis Play Ground
St. Aidan's Ch.
OPENSHAW
Goods & Mineral Depot (M.R.)
Gas Works
Goods Yard
Ashbury's Sta.
Otto Gas Engine Works
Engineering Works
Ashbury's Works
ARDWICK CEMETERY
Mort. Chap.
Bennett's Sidings
Galloway's Boiler Works
Brick Field
Electricity Sub-station
Chemical Works
Iron Works
Corn Brook
Iron Foundry
Football Ground
Tramway Depot
Gas Plant Works
Chemical Works
Conservative Club
GORTON PARK
WEST GORTON
Bowling Green
Mission Room
Brick Works
Athletic Ground
Brewery
Gasometer
Football Ground
Tank Row Cricket Ground
BELLE VUE
ZOOLOGICAL GARDENS
Higher Catsknowl
Lower Catsknowl
Longsight Sta.
Kirkmanshulme House
Football Ground
Public Baths
Church
Tarpaulin Works
Sewage Works (Gorton U.D.C.)
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# Envirocheck®

## Lancashire And Furness

## Published 1909

## Source map scale - 1:10,560

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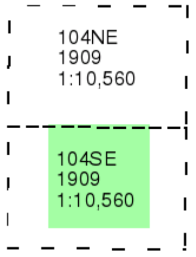
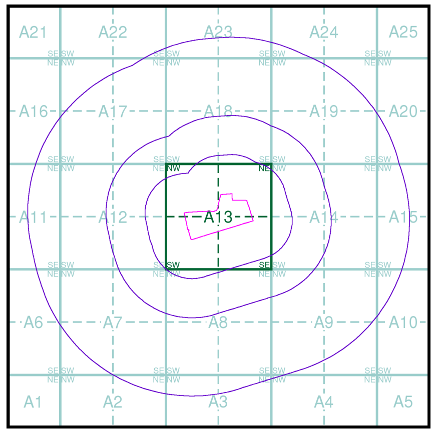
## Map Name(s) and Date(s)


104NE
1909
1:10,560
104SE
1909
1:10,560

## Historical Map - Slice A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## Order Details

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|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

**Landmark** Information Group

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|---|---|
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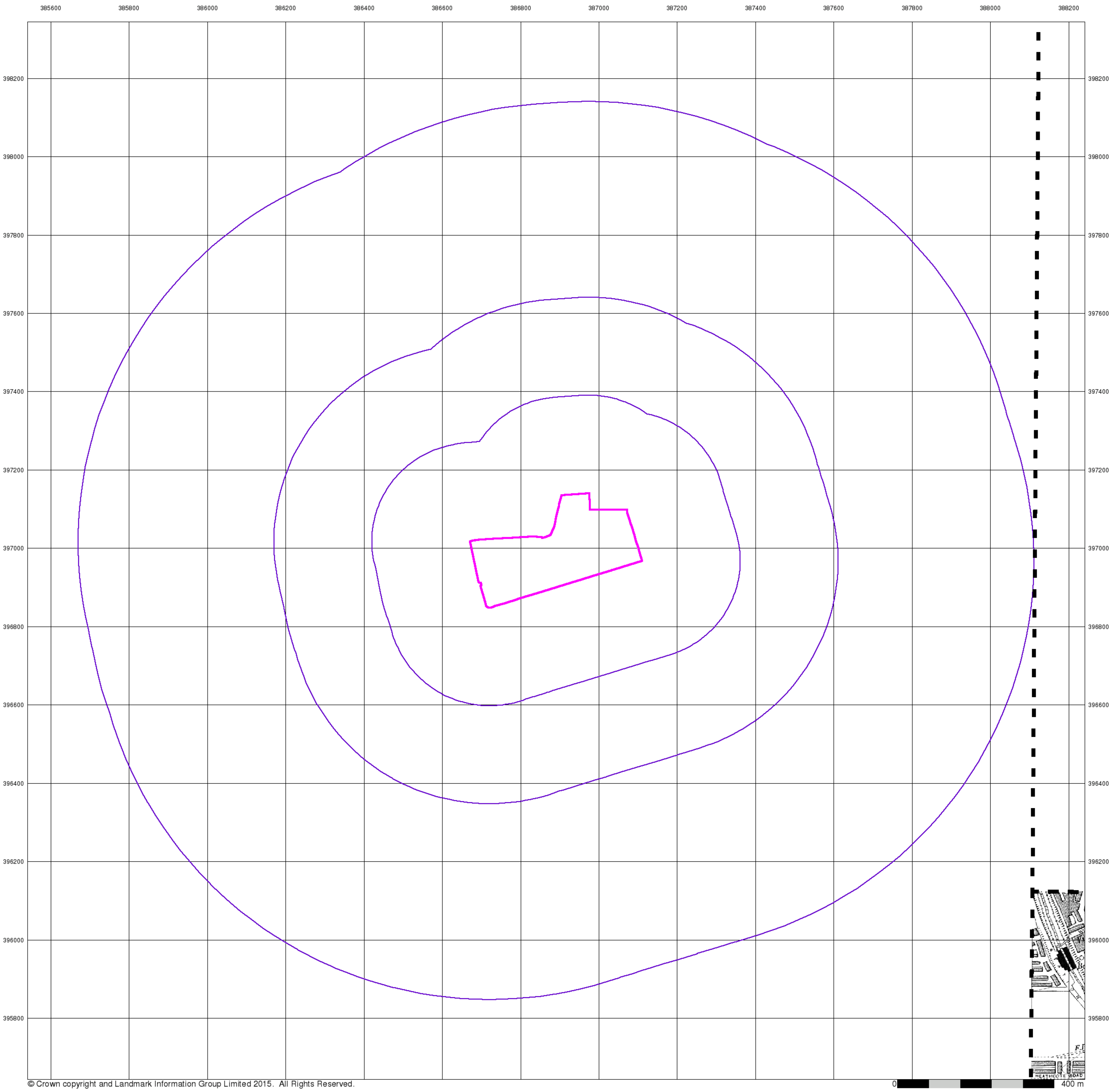
| Fax: | 0844 844 9951 |
| Web: | www.envirocheck.co.uk |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Envirocheck®

## Cheshire

## Published 1911

## Source map scale - 1:10,560

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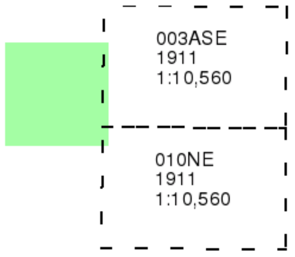
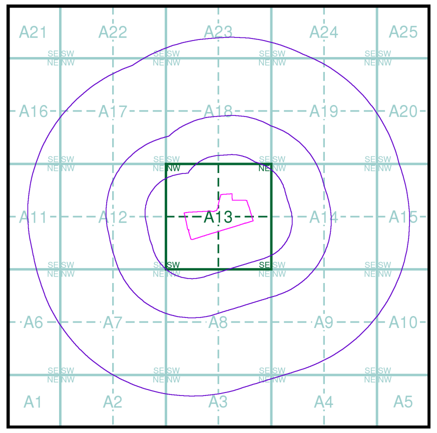
## Map Name(s) and Date(s)


003ASE
1911
1:10,560
010NE
1911
1:10,560

## Historical Map - Slice A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## Order Details

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|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

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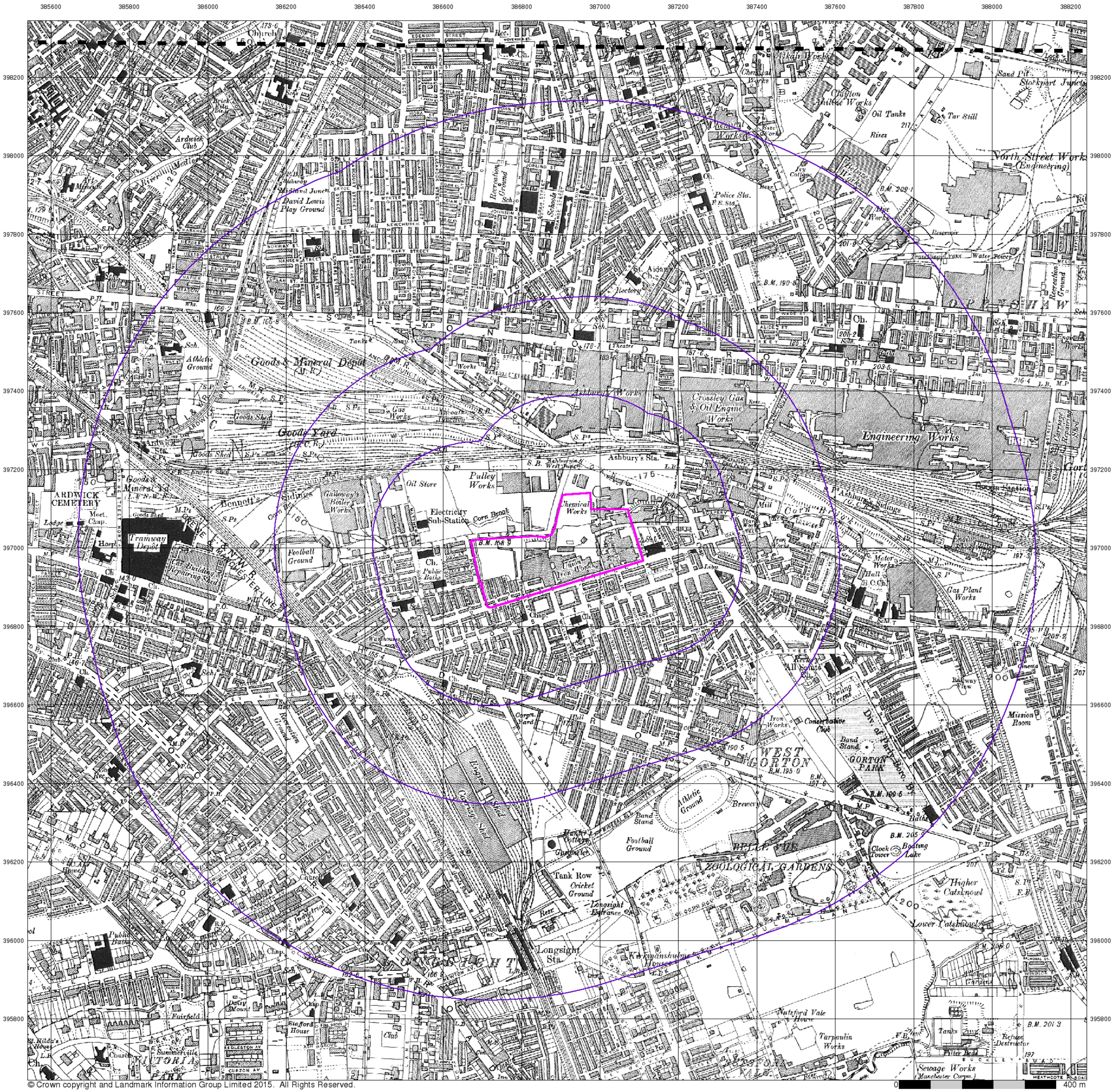
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## Lancashire And Furness

## Published 1923

## Source map scale - 1:10,560

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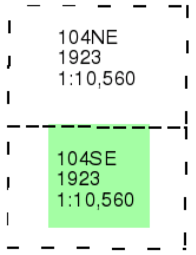
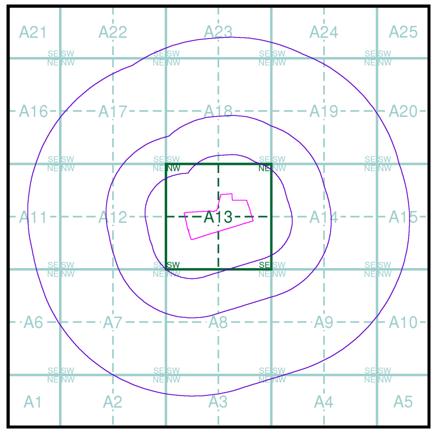
## Map Name(s) and Date(s)


104NE
1923
1:10,560
104SE
1923
1:10,560

## Historical Map - Slice A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## Order Details

| | |
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| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

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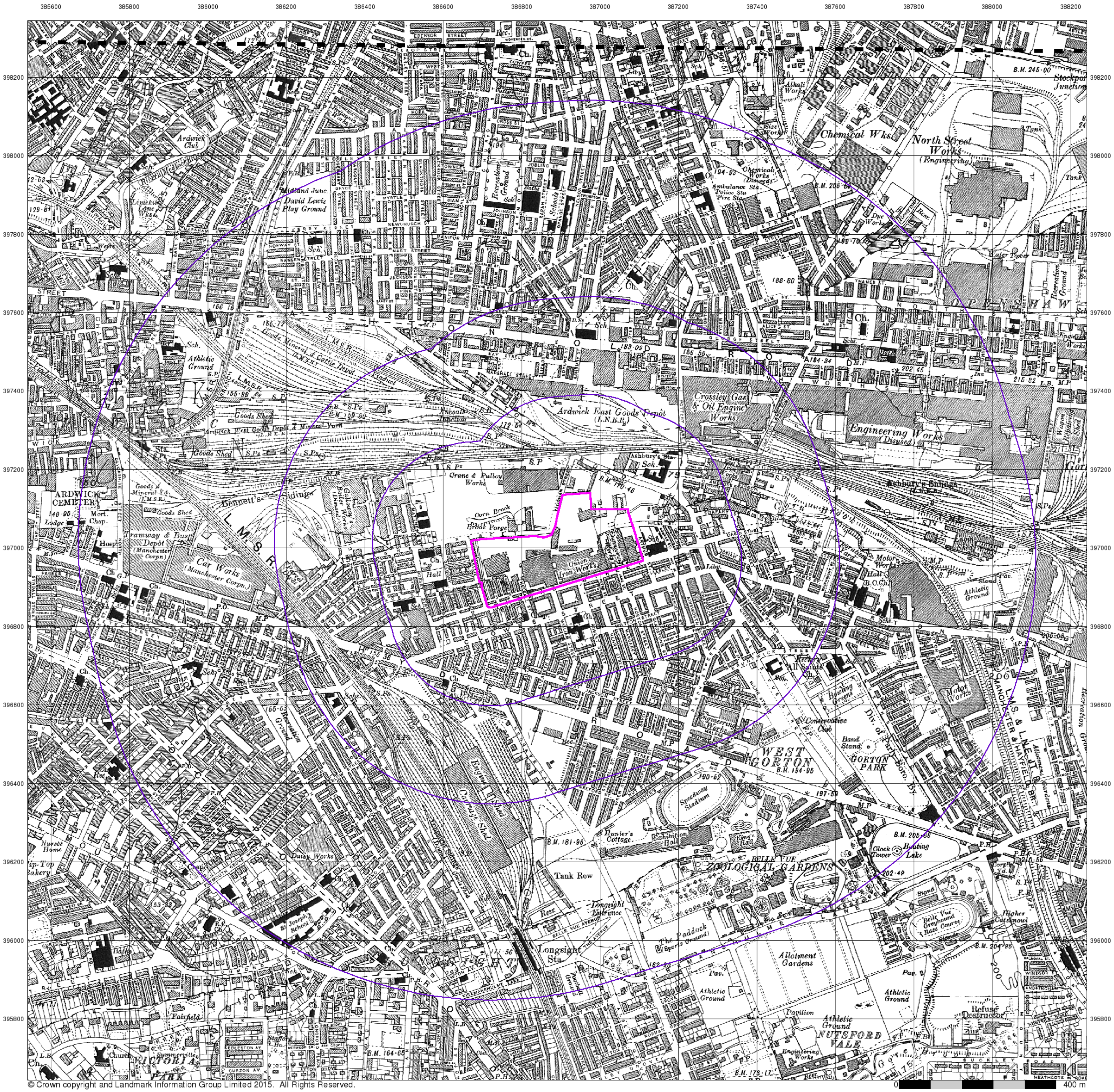
|---|---|
| Tel: | 0844 844 9952 |
| Fax: | 0844 844 9951 |
| Web: | www.envirocheck.co.uk |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Ardwick Club
Midland Junc David Lewis Play Ground
Chemical Wks
North Street Works (Engineering)
Stockport Junction
Chemical Works (Disused)
Ambulance Sta. Fire Sta.
Dye Works
Water Tower
Recreation Ground
OPENSHAW
Athletic Ground
L.M.S.R.
Goods Shed
Ardwick West Goods Depot & Mineral Yard
Ardwick East Goods Depot (L.N.E.R.)
Crossley Gas & Oil Engine Works
Engineering Works (Disused)
Ashbury's Sch.
Ashbury's Sidings
Crane & Pulley Works
Corn Brook Brass Forge
Union Iron Works
ARDWICK CEMETERY
Tramway & Bus Depot (Manchester Corpn.)
Car Works (Manchester Corpn.)
Bennett St. Sidings
Motor Works
Athletic Ground
Bowling Green
Band Stand
WEST GORTON
GORTON PARK
Speedway Stadium
Hunter's Cottage
Exhibition Hall
BELLE VUE ZOOLOGICAL GARDENS
Clock Tower
Boating Lake
Belle Vue Greyhound Race Course
Tank Row
Longsight Entrance
Longsight Sta.
The Paddock (Sports Ground)
Allotment Gardens
Athletic Ground
Pavilion
NUTSFORD VALE
Refuse Destructor
Engineering Works
Daisy Works
St. Joseph's School
Fairfield
VICTORIA PARK
Nurses Home
Higher Cattlewood
Engine Shed
0
400 m

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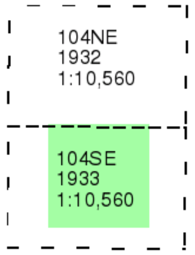
## Lancashire And Furness

## Published 1932 - 1933

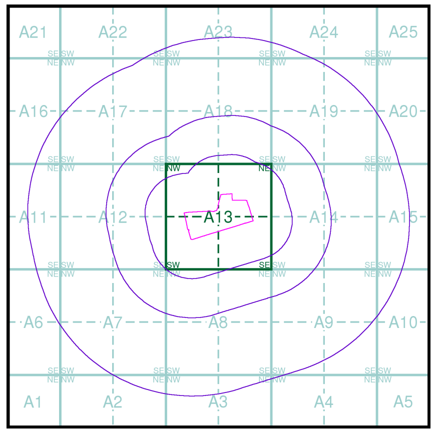
## Source map scale - 1:10,560

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)


104NE
1932
1:10,560
104SE
1933
1:10,560

## Historical Map - Slice A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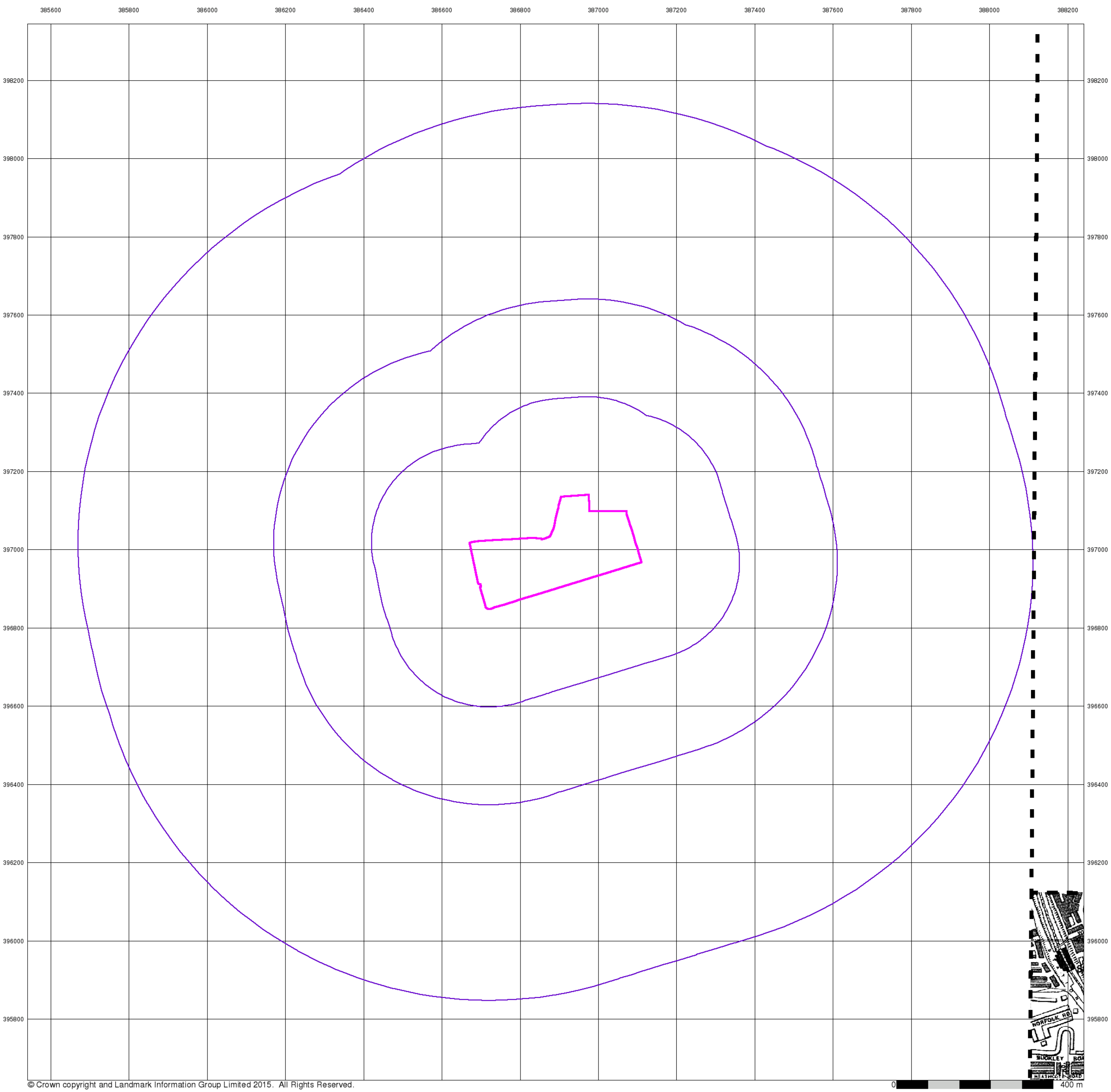
## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk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NORFOLK RD
BUCKLEY
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400 m

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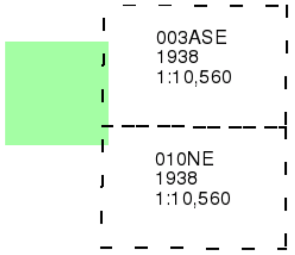
## Cheshire

## Published 1938

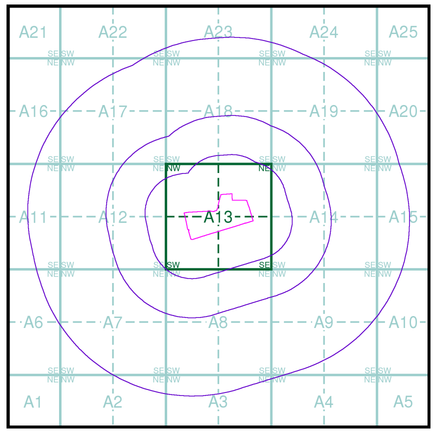
## Source map scale - 1:10,560

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)


003ASE
1938
1:10,560
010NE
1938
1:10,560

## Historical Map - Slice A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## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

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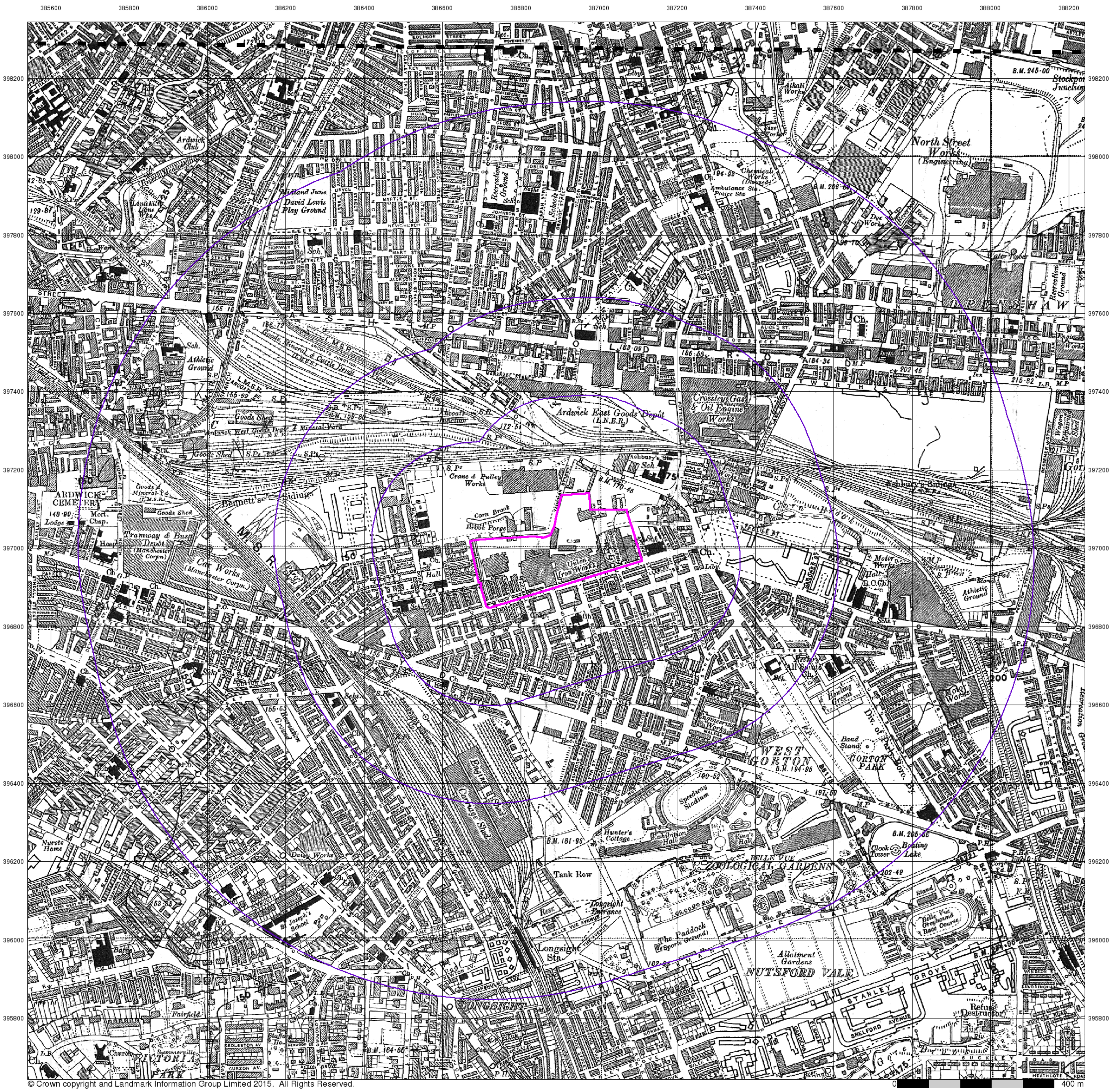
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Ardwick Club
Midland Junc. David Lewis Play Ground
North Street Works (Engineering)
Chemical Works (Disused)
Ambulance Sta. Police Sta.
Alkali Works
Stockport Junction
Athletic Ground
Goods Mineral & Cattle Depot
Crossley Gas & Oil Engine Works
Ardwick East Goods Depot (L.N.E.R.)
Ardwick West Goods Depot & Mineral Yard
Goods Shed
Bennett's Sidings
Crane & Pulley Works
Corn Brook Forge
Union Iron Works
Ardwick Cemetery
Tramway & Bus Depot (Manchester Corpn.)
Car Works (Manchester Corpn.)
Ashbury's Sidings
Ashbury's Sch.
West Gorton
Gorton Park
Speedway Stadium
Hunter's Cottage
Exhibition Hall
Belle Vue Zoological Gardens
Tank Row
Longsight Sta.
Longsight Entrance
The Paddock (Sports Ground)
Allotment Gardens
Nutsford Vale
Boating Lake
Clock Tower
Belle Vue Greyhound Race Course
Refuse Destructor
Stanley Grove
Engine Shed
Carriage Shed
Openshaw
Longsight
Victoria Park
0
400 m

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**Envirocheck®**

## Lancashire And Furness

### Published 1938

### 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)

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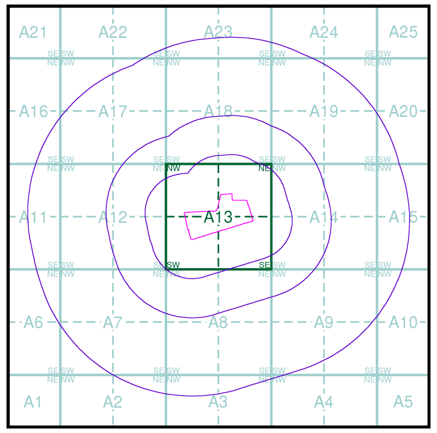
1938
1:10,560

104SE
1938
1:10,560

## Historical Map - Slice A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## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

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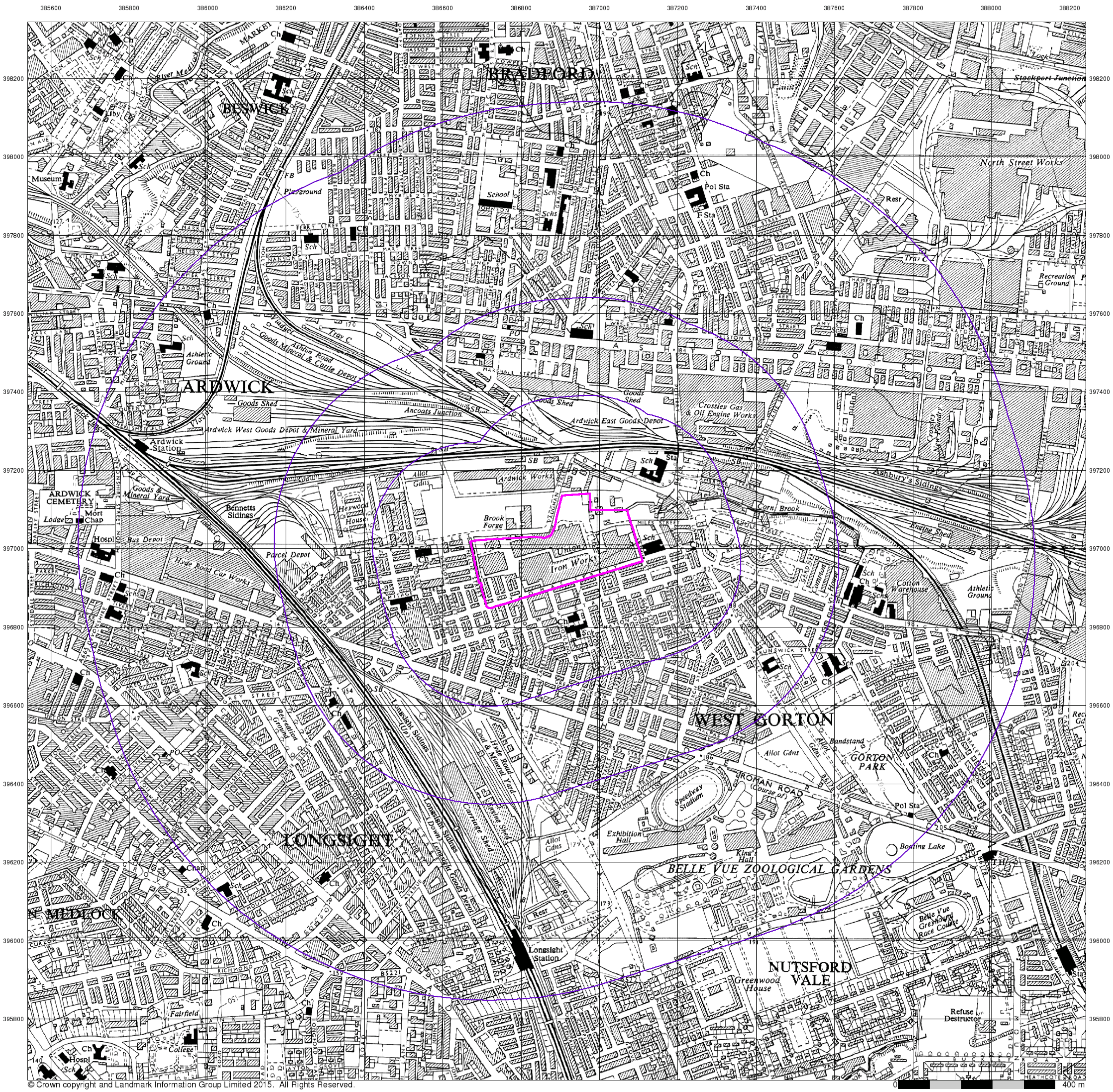
|---|---|
| Tel: | 0844 844 9952 |
| Fax: | 0844 844 9951 |
| Web: | www.envirocheck.co.uk |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BRADFORD
BESWICK
ARDWICK
WEST GORTON
LONGSIGHT
NUTSFORD VALE
BELLE VUE ZOOLOGICAL GARDENS
GORTON PARK
MEDLOCK
Ardwick Station
Longsight Station
Ardwick Cemetery
Ardwick East Goods Depot
Ardwick West Goods Depot & Mineral Yard
Ancoats Junction
Ashton Road Goods Mineral & Cattle Depot
Crossley Gas & Oil Engine Works
Union Iron Works
Ardwick Works
Brook Forge
Bennetts Sidings
Parcel Depot
Hyde Road Car Works
Bus Depot
Ashbury's Sidings
Engine Shed
Cotton Warehouse
North Street Works
Stockport Junction
Speedway Stadium
Exhibition Hall
King's Hall
Bowling Lake
Belle Vue Greyhound Race Course
Greenwood House
Refuse Destructor
Athletic Ground
Recreation Ground
Museum
School
Pol Sta
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400 m

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# Envirocheck®

## Ordnance Survey Plan

## Published 1956

## Source map scale - 1:10,000

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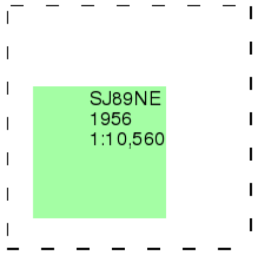
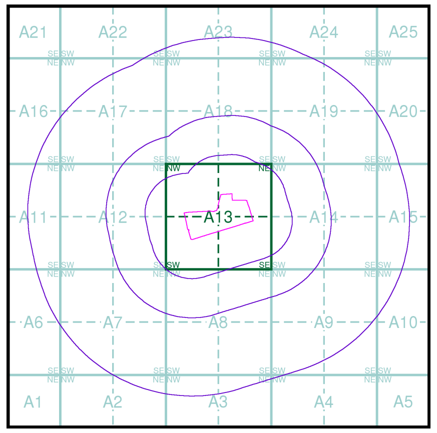
## Map Name(s) and Date(s)


SJ89NE
1956
1:10,560

## Historical Map - Slice A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## Order Details

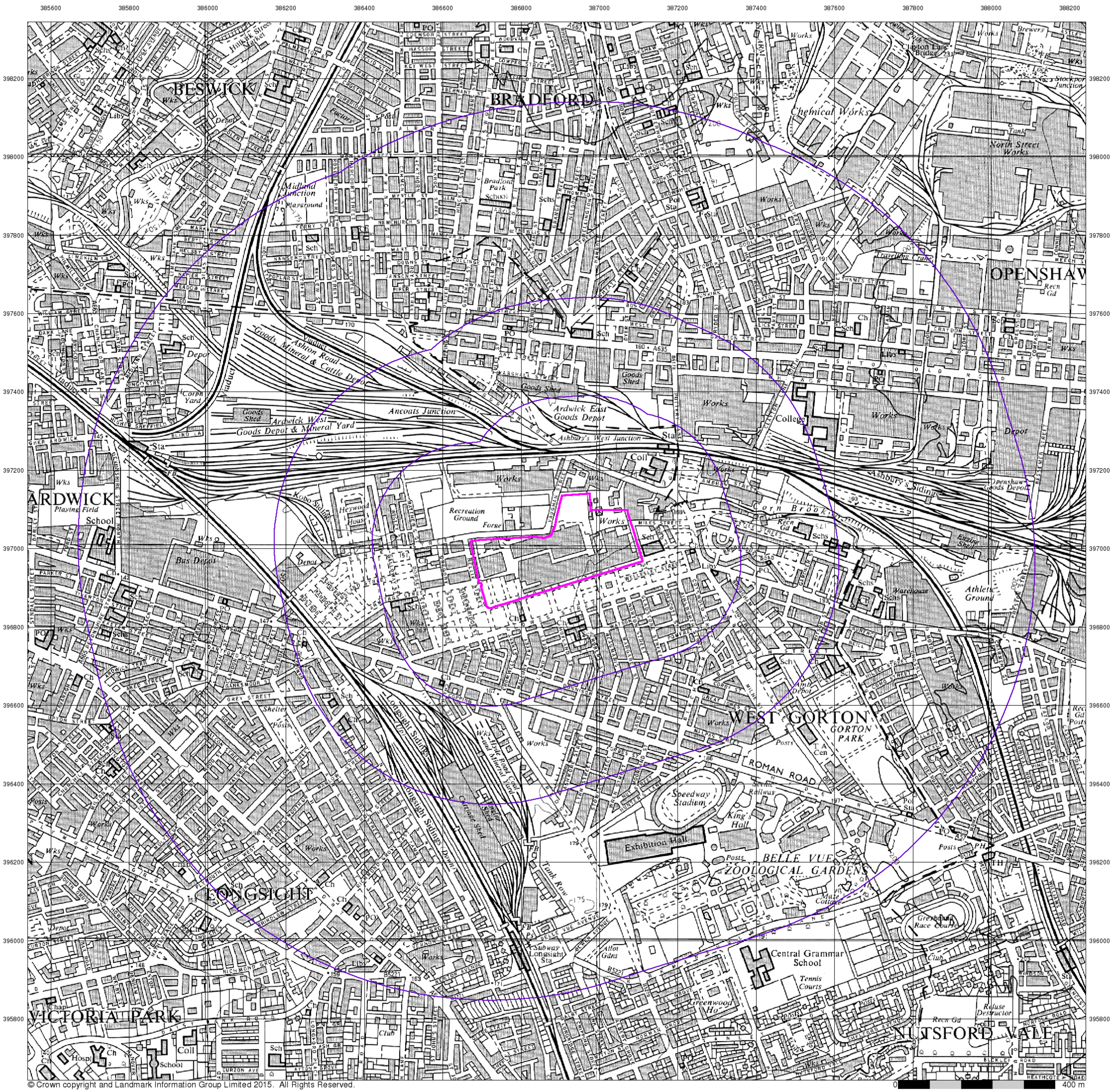
| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

Landmark Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk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395800
BESWICK
BRADFORD
OPENSHAW
ARDWICK
WEST GORTON
GORTON PARK
LONGSIGHT
VICTORIA PARK
NUTSFORD VALE
BELLE VUE ZOOLOGICAL GARDENS
Speedway Stadium
Exhibition Hall
Central Grammar School
Ardwick East Goods Depot
Ardwick West Goods Depot & Mineral Yard
Ancoats Junction
Ashbury's West Junction
Ashbury's Sidings
Chemical Works
North Street Works
Recreation Ground
Bus Depot
Longsight Sidings
Athletic Ground
0
400 m

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## Ordnance Survey Plan

## Published 1968

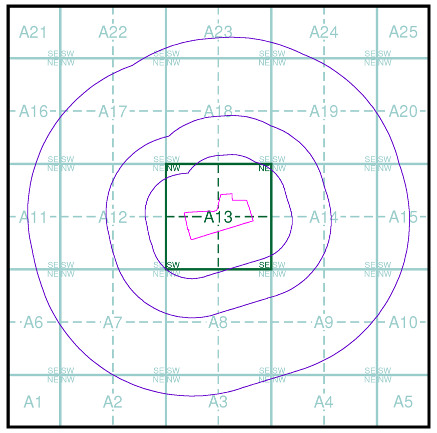
## Source map scale - 1:10,000

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)

SJ89NE
1968
1:10,560

## Historical Map - Slice A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## Order Details

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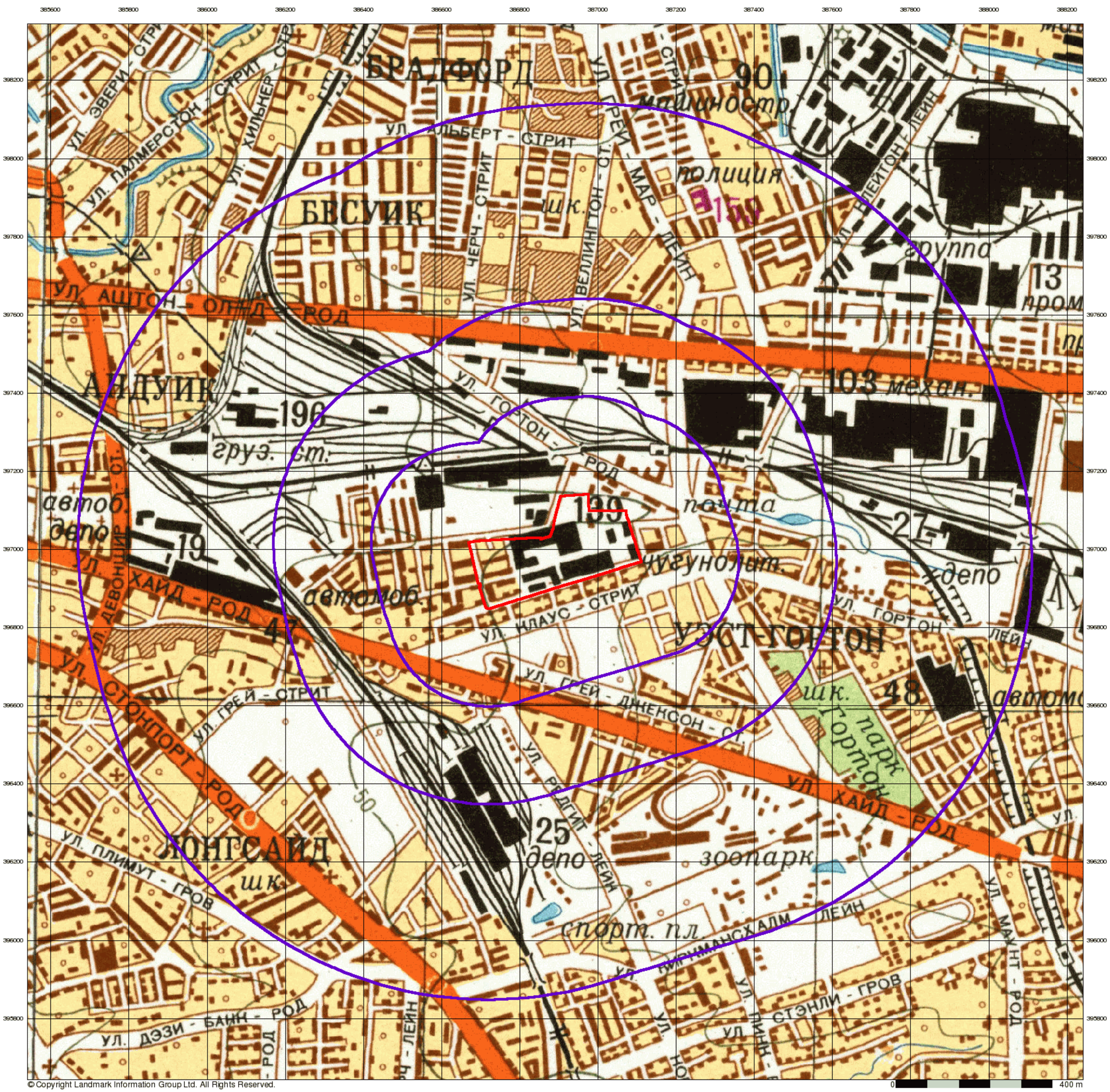
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

**Landmark®** Information Group

| | |
|---|---|
| Tel: | 0844 844 9952 |
| Fax: | 0844 844 9951 |
| Web: | www.envirocheck.co.uk |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БРАДФОРД
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ЛОНГСАЙД
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УЛ. АШТОН - ОЛД - РОД
УЛ. ГОРТОН - РОД
УЛ. ХАЙД - РОД
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зоопарк
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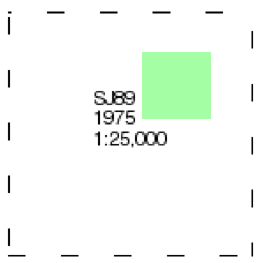
## Manchester

## Published 1975

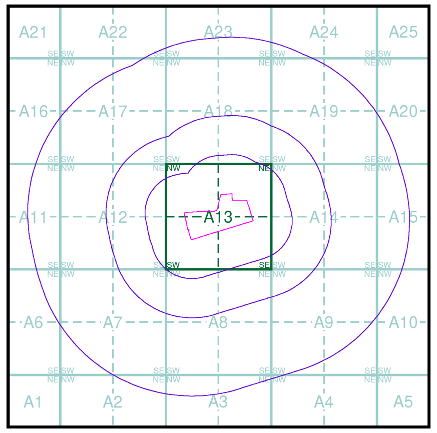
## Source map scale - 1:25,000

These maps were produced by the Russian military during the Cold War between 1950 and 1997, and cover 103 towns and cities throughout the U.K. The maps are produced at 1:25,000, 1:10,000 and 1:5,000 scale, and show detailed land use, with colour-coded areas for development, green areas, and non-developed areas. Buildings are coloured black and important building uses (such as hospitals, post offices, factories etc.) are numbered, with a numbered key describing their use.
They were produced by the Russians for the benefit of navigation, as well as strategic military sites and transport hubs, for use if they were to have invaded the U.K. The detailed information provided indicates that the areas were surveyed using land-based personnel, on the ground, in the cities that are mapped.

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


SJ89
1975
1:25,000

## Russian Map - Slice A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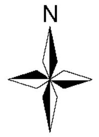

## Order Details

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| National Grid Reference: | 386890, 396990 |
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| Search Buffer (m): | 1000 |

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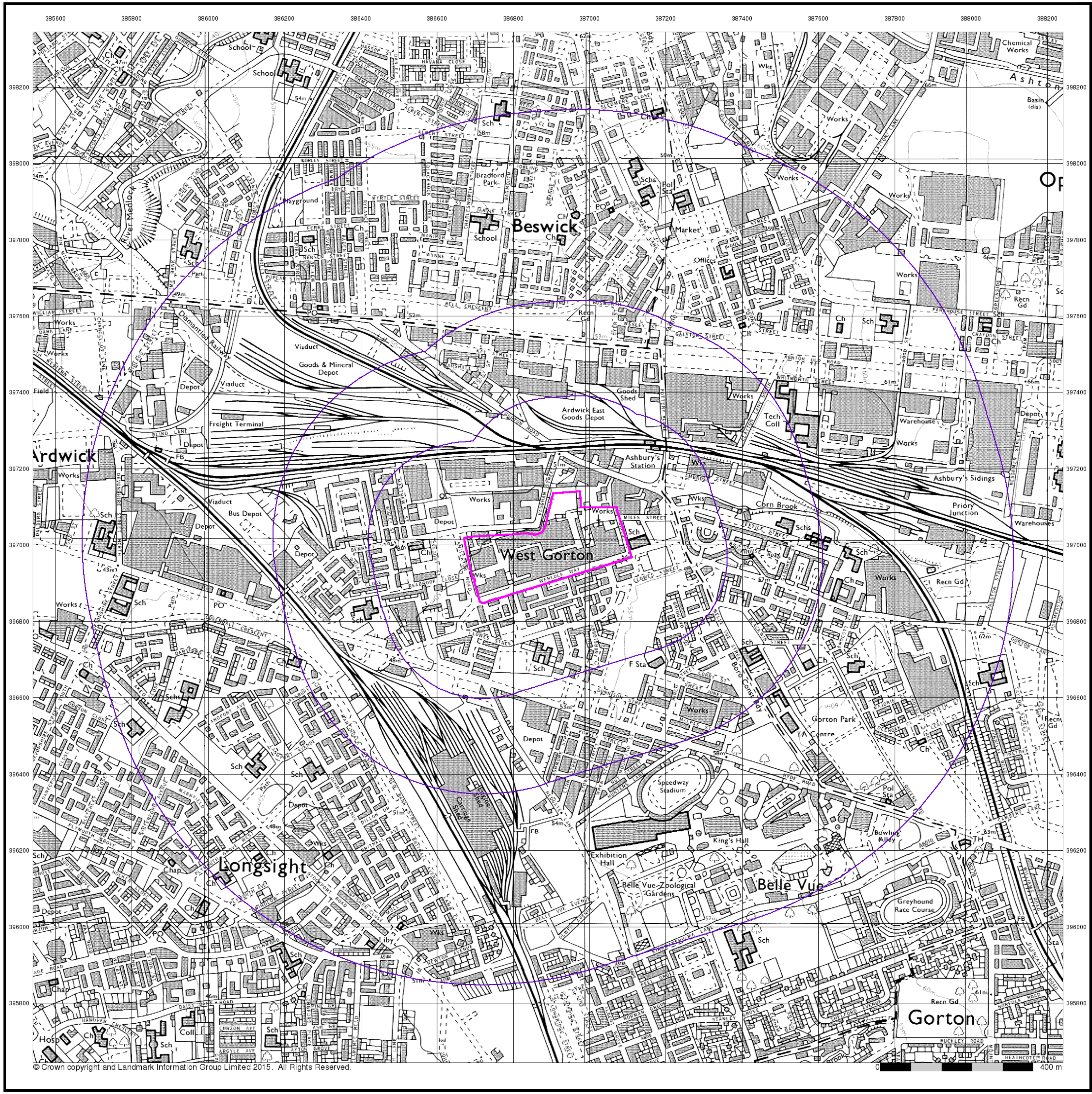

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Longsight
Belle Vue
Gorton
Ardwick East Goods Depot
Ashbury's Station
Ashbury's Sidings
Freight Terminal
Goods & Mineral Depot
Speedway Stadium
Belle Vue Zoological Gardens
Exhibition Hall
King's Hall
Greyhound Race Course
Gorton Park
Dismantled Railway
River Medlock
Bradford Park
Corn Brook
Priory Junction
0
400 m

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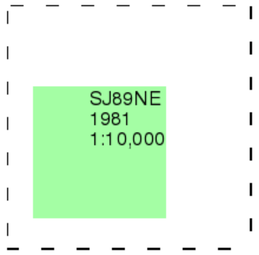
## Ordnance Survey Plan

## Published 1981

## 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)



SJ89NE
1981
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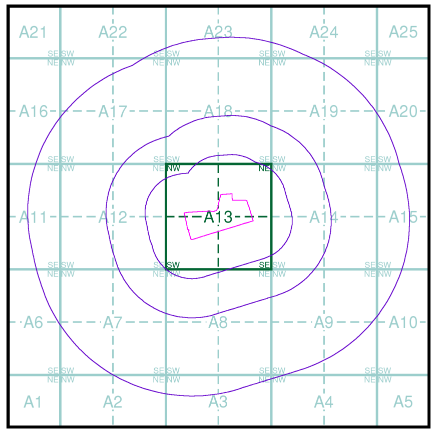
## Historical Map - Slice A



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## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

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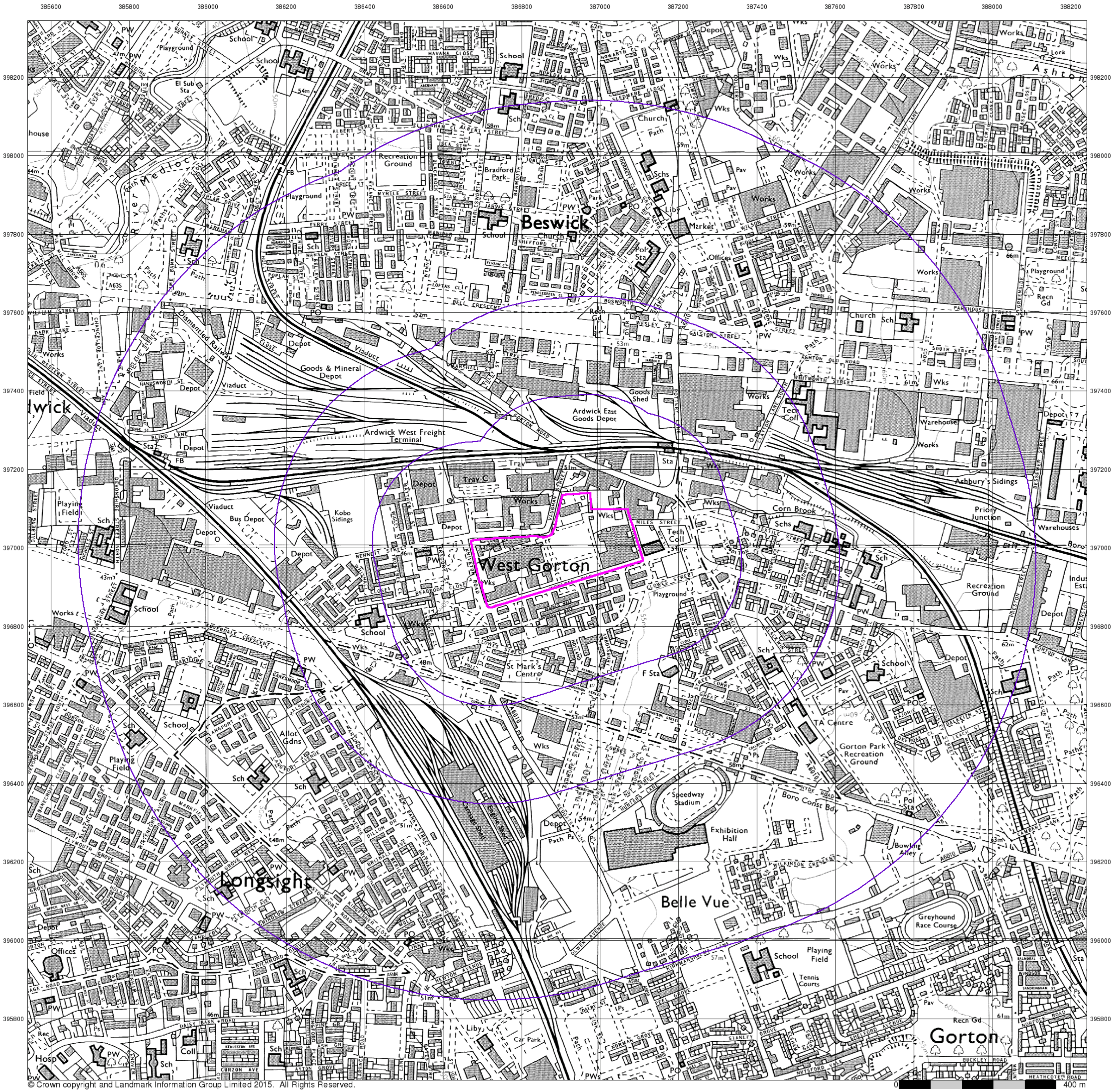
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Belle Vue
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Ardwick West Freight Terminal
Ardwick East Goods Depot
Goods & Mineral Depot
Recreation Ground
Bradford Park
St Mark's Centre
Speedway Stadium
Exhibition Hall
Gorton Park Recreation Ground
Greyhound Race Course
Corn Brook
Kobo Sidings
Ashbury's Sidings
Priory Junction
Dismantled Railway
River Medlock
TA Centre
Bus Depot
Playing Field
0
400 m

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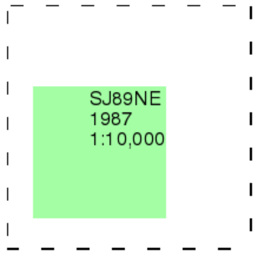
## Ordnance Survey Plan

## Published 1987

## 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)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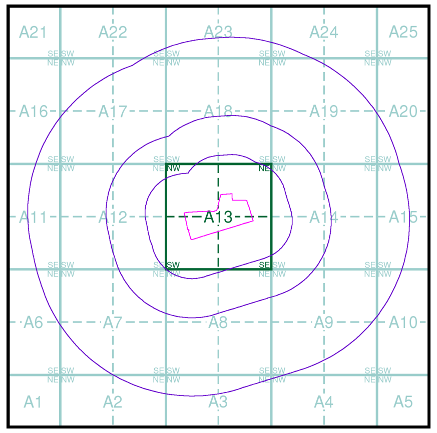
1:10,000

## Historical Map - Slice A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## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

| | |
|---|---|
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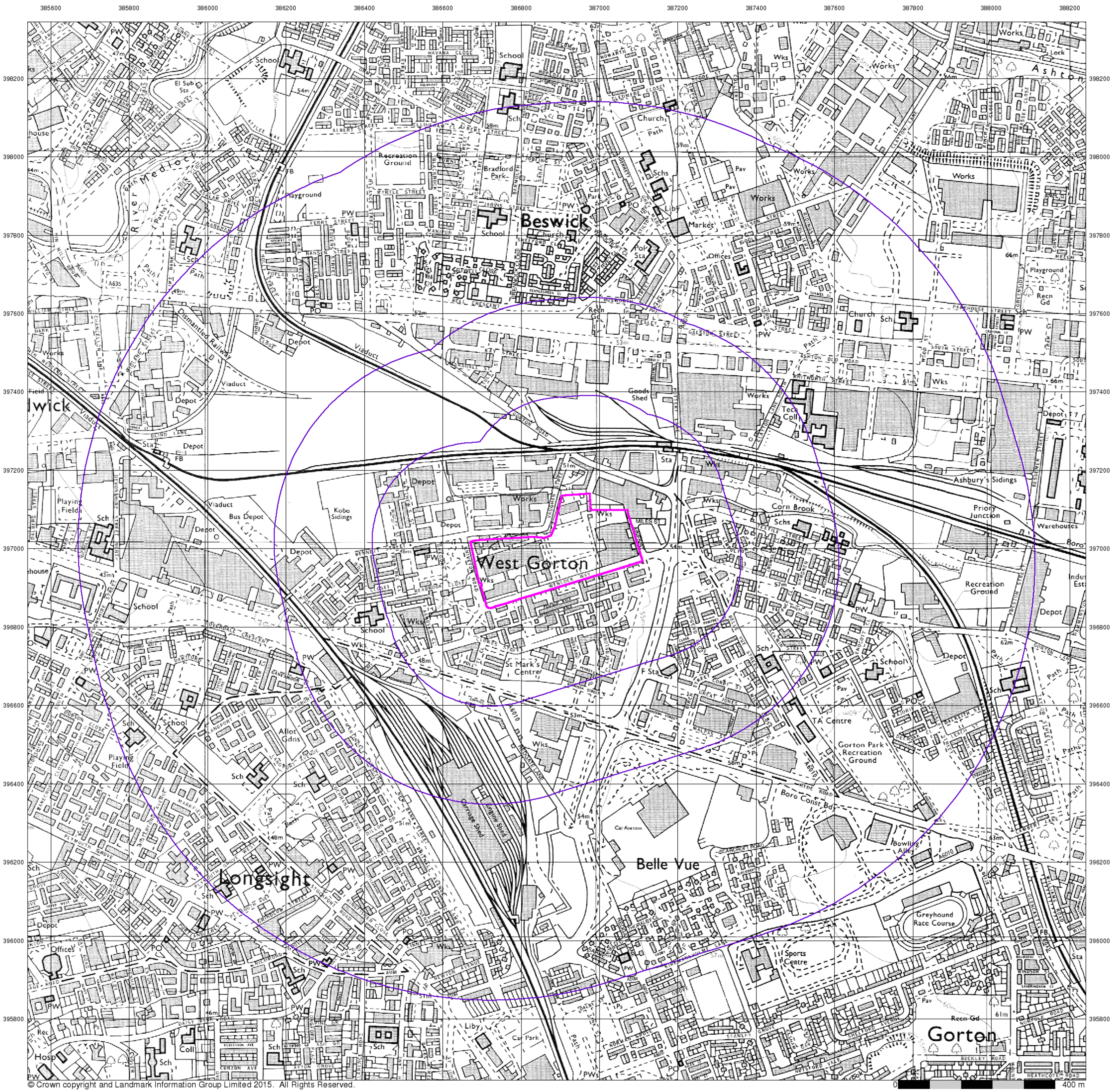
| Web: | www.envirocheck.co.uk |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Beswick
West Gorton
Belle Vue
Longsight
Gorton
River Medlock
Dismantled Railway
Viaduct
Goods Shed
Ashbury's Sidings
Priory Junction
Corn Brook
Kobo Sidings
Bus Depot
St Mark's Centre
Carriage Shed
Gorton Park Recreation Ground
Greyhound Race Course
Sports Centre
Car Auction
TA Centre
Tech Coll
Recreation Ground
Bradford Park
Boro Const Bd
Bowling Alley
0
400 m

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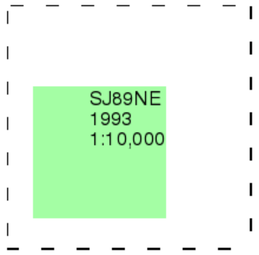
## Ordnance Survey Plan

## Published 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)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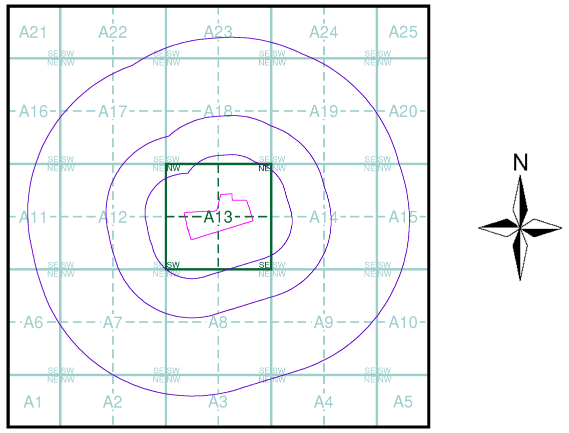
## Historical Map - Slice A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## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

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|---|---|
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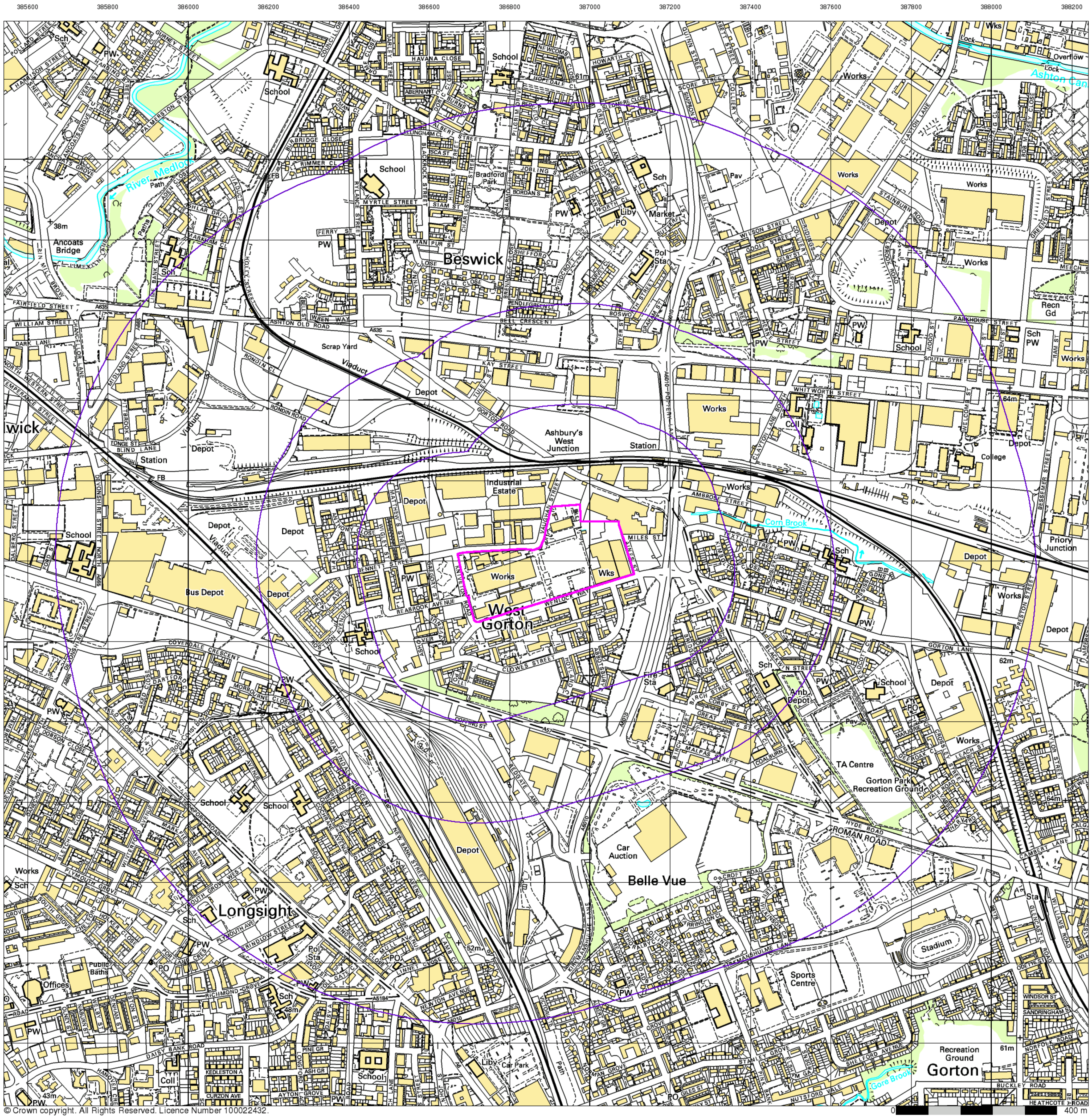
| Fax: | 0844 844 9951 |
| Web: | www.envirocheck.co.uk |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Beswick
West Gorton
Belle Vue
Longsight
Gorton
Ancoats Bridge
River Medlock
Ashton Canal
Corn Brook
Gore Brook
Ashbury's West Junction
Priory Junction
Industrial Estate
Bradford Park
Scrap Yard
Viaduct
Station
Bus Depot
Car Auction
TA Centre
Gorton Park Recreation Ground
Recreation Ground
Stadium
Sports Centre
Works
Wks
Depot
School
College
0
400 m

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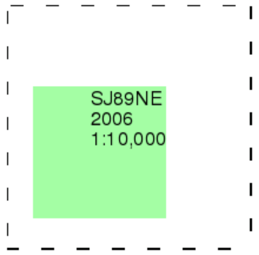
## 10k Raster Mapping

## 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)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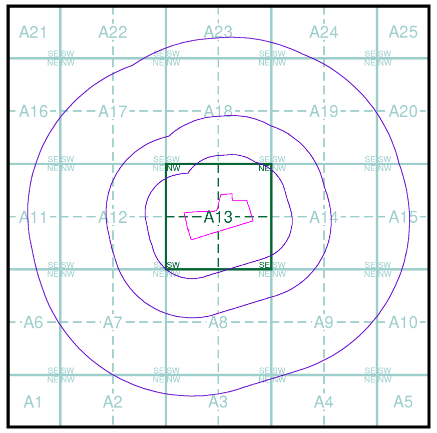
2006
1:10,000

## Historical Map - Slice A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## Order Details

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|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

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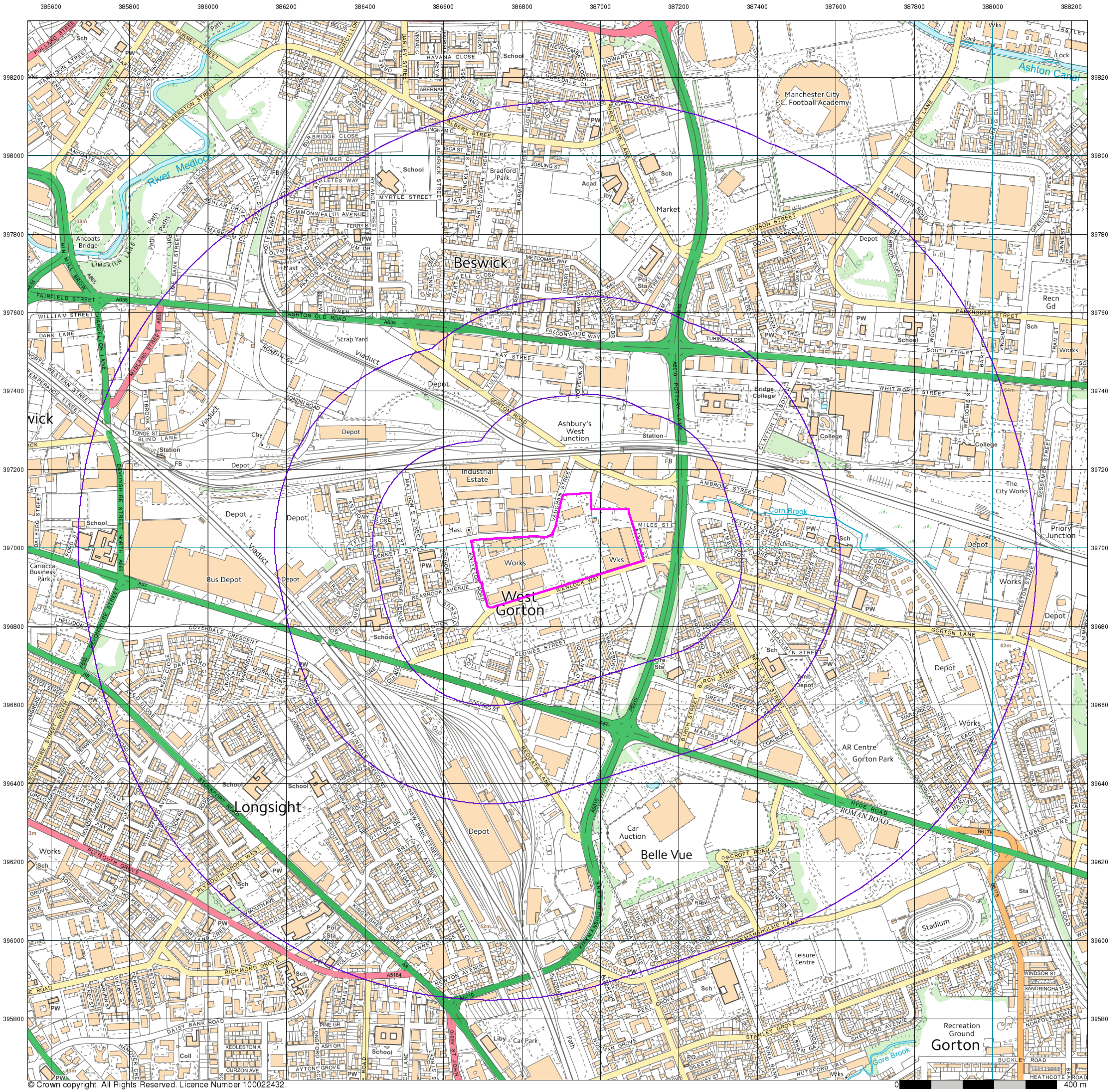
| Fax: | 0844 844 9951 |
| Web: | www.envirocheck.co.uk |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West Gorton
Longsight
Belle Vue
Gorton
Manchester City F.C. Football Academy
Ashton Canal
River Medlock
Ashbury's West Junction
Industrial Estate
Corn Brook
Bus Depot
Car Auction
Stadium
Leisure Centre
Recreation Ground
AR Centre
Gorton Park
Bridge College
Works
Wks
Depot
Station
School
ASHTON OLD ROAD
HYDE ROAD
GORTON LANE
Viaduct
0
400 m

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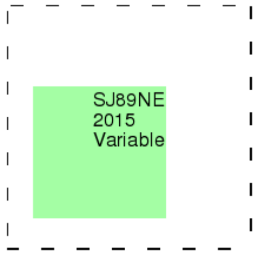
## VectorMap Local

## Published 2015

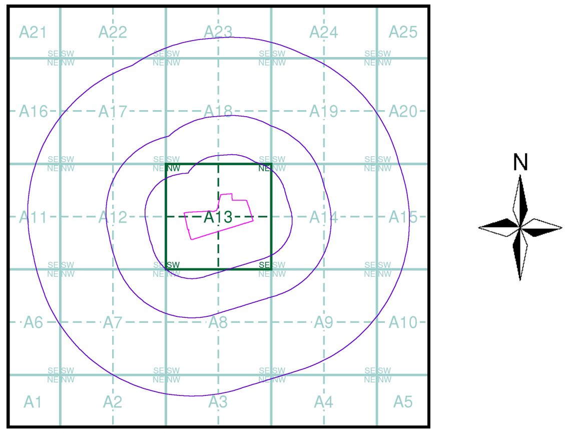
## Source map scale - 1:10,000

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)


SJ89NE
2015
Variable

## Historical Map - Slice A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## Order Details

| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

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

# Envirocheck® Report:

## Historical Data Report Datasheet

### Order Details:

**Order Number:**
72946036_1_1

**Customer Reference:**
2913

**National Grid Reference:**
386890, 396990

**Slice:**
A

**Site Area (Ha):**
6.84

**Search Buffer (m):**
1000

### Site Details:

Site at 386930, 397100

### Client Details:

MR J Henning
Integra Consulting (Environmental) Ltd
Suite 3
14-32 Hewitt Street
Manchester
M15 4GB

# Contents

| Report Section | Page Number |
|---|---|
| **Summary** | **-** |
| **Historical Building Plans Information** | **-** |
| **Historical Land Use Information** | **1** |
| **Historical Tanks and Energy Facilities** | **13** |
| **Historical Map List** | **15** |
| **Useful Contacts and Further Information** | **17** |

**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 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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**Report Version v50.0**

| Data Type | Page Number | On Site | 0 to 250m | 251 to 500m | 501 to 1000m |
|---|---|---|---|---|---|
| **Historical Building Plans Information** | | | | | |
| Areas Cleared Due To Enemy Action | | | | | |
| Above Ground Fuel Tanks (100m) | | | | n/a | n/a |
| Asbestos (100m) | | | | n/a | n/a |
| Benzene/Benzole/Naphtha, Naphthalene/Kerosene (100m) | | | | n/a | n/a |
| Electricity Generation (100m) | | | | n/a | n/a |
| Electricity Sub-Stations (100m) | | | | n/a | n/a |
| Gas Industry (100m) | | | | n/a | n/a |
| Gas Storage (100m) | | | | n/a | n/a |
| Gas Use (100m) | | | | n/a | n/a |
| Oil Industry (100m) | | | | n/a | n/a |
| Oil Storage (100m) | | | | n/a | n/a |
| Oil Use (100m) | | | | n/a | n/a |
| Paint based Oils (100m) | | | | n/a | n/a |
| Paraffin (100m) | | | | n/a | n/a |
| Petrol and Diesel Industry (100m) | | | | n/a | n/a |
| Petrol and Diesel Storage (100m) | | | | n/a | n/a |
| Petrol and Diesel Use (100m) | | | | n/a | n/a |
| Potential Fuel Gas (100m) | | | | n/a | n/a |
| Potential Fuel Oil (100m) | | | | n/a | n/a |
| Potential Fuel Use (100m) | | | | n/a | n/a |
| Potential Petrol and Diesel (100m) | | | | n/a | n/a |
| Potential Tanks (100m) | | | | n/a | n/a |
| Potentially Fuel-related Tanks (100m) | | | | n/a | n/a |
| Underground Fuel Tanks (100m) | | | | n/a | n/a |
| **Historical Land Use Information** | | | | | |
| Former Marshes | | | | | |
| Historical Flood Liabilities | | | | | |
| Potentially Contaminative Industrial Uses (Past Land Use) | pg 1 | 4 | 27 | 25 | 51 |
| Potentially Infilled Land (Non-Water) | pg 6 | | 2 | 4 | 8 |
| Potentially Infilled Land (Water) | pg 6 | 5 | 21 | 28 | 68 |

| Data Type | Page Number | On Site | 0 to 250m | 251 to 500m | 501 to 1000m |
|---|---|---|---|---|---|
| **Historical Tanks and Energy Facilities** | | | | | |
| Electrical Sub Station Facilities (100m) | pg 13 | 7 | 4 | n/a | n/a |
| Electricity Industry Facilities (100m) | | | | n/a | n/a |
| Gas Industry Facilities (100m) | pg 13 | | 1 | n/a | n/a |
| Gas Monitoring Facilities (100m) | | | | n/a | n/a |
| Miscellaneous Power Facilities (100m) | | | | n/a | n/a |
| Oil Industry Facilities (100m) | | | | n/a | n/a |
| Petroleum Storage Facilities (100m) | | | | n/a | n/a |
| Potential Tanks (100m) | | | | n/a | n/a |
| Tanks (100m) | pg 13 | 5 | 9 | n/a | n/a |

# Historical Land Use Information

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 1 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Chemical manufacturing general<br>Date of Mapping: 1848 | A13NE<br>(NE) | 0 | 1 | 386968<br>397034 |
| 2 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Chemical manufacturing general<br>Date of Mapping: 1848 - 1923 | A13NE<br>(NE) | 0 | 1 | 387043<br>397062 |
| 3 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Metal casting/foundries<br>Date of Mapping: 1909 - 1956 | A13SW<br>(NE) | 0 | 1 | 386885<br>396992 |
| 4 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1956 - 1993 | A13SW<br>(NE) | 0 | 1 | 386885<br>396992 |
| 5 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Chemical manufacturing general<br>Date of Mapping: 1848 | A13NW<br>(N) | 12 | 1 | 386872<br>397052 |
| 6 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Metal casting/foundries<br>Date of Mapping: 1956 | A13NW<br>(NW) | 12 | 1 | 386833<br>397042 |
| 7 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Chemical manufacturing general<br>Date of Mapping: 1895 | A13NW<br>(N) | 13 | 1 | 386870<br>397048 |
| 8 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Machinery: engines, building and general industrial [manufacture]<br>Date of Mapping: 1923 | A13NW<br>(N) | 14 | 1 | 386878<br>397143 |
| 9 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Clay bricks & tiles [manufacture]<br>Date of Mapping: 1895 | A13NW<br>(N) | 15 | 1 | 386868<br>397140 |
| 10 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Road haulage<br>Date of Mapping: 1993 | A13NW<br>(W) | 18 | 1 | 386656<br>397027 |
| 11 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Clay bricks & tiles [manufacture]<br>Date of Mapping: 1909 | A13NW<br>(NW) | 77 | 1 | 386807<br>397129 |
| 12 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Tableware & other ceramics [manufacture]<br>Date of Mapping: 1848 - 1895 | A13NE<br>(NE) | 82 | 1 | 387089<br>397181 |
| 13 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Railways<br>Date of Mapping: 1956 - 1993 | A13NE<br>(N) | 95 | 1 | 386949<br>397234 |
| 14 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Railways<br>Date of Mapping: 1895 - 1956 | A13NW<br>(N) | 97 | 1 | 386874<br>397231 |
| 15 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Railways<br>Date of Mapping: 1848 - 1993 | A13NW<br>(N) | 103 | 1 | 386873<br>397237 |
| 16 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Railways<br>Date of Mapping: 1895 - 1993 | A13NW<br>(N) | 108 | 1 | 386886<br>397242 |
| 17 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1895 - 1923 | A13NE<br>(N) | 122 | 1 | 386926<br>397259 |
| 18 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Electricity production & distribution [inc large transformers]<br>Date of Mapping: 1909 - 1923 | A12NE<br>(W) | 131 | 1 | 386547<br>397062 |
| 19 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1993 | A13NE<br>(E) | 153 | 1 | 387227<br>397110 |
| 20 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Metal casting/foundries<br>Date of Mapping: 1923 | A12SE<br>(SW) | 160 | 1 | 386548<br>396843 |
| 21 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1956 - 1993 | A12SE<br>(SW) | 162 | 1 | 386548<br>396838 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 22 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Heavy product manufacture - rolling and drawing of iron, steel and ferroalloys<br>Date of Mapping: 1895 - 1923 | A12SE<br>(W) | 206 | 1 | 386467<br>396993 |
| 23 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Metal casting/foundries<br>Date of Mapping: 1923 | A14NW<br>(NE) | 210 | 1 | 387266<br>397178 |
| 24 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Railways<br>Date of Mapping: 1895 - 1993 | A13NW<br>(NW) | 215 | 1 | 386605<br>397222 |
| 25 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Railways<br>Date of Mapping: 1848 | A13NW<br>(NW) | 221 | 1 | 386604<br>397227 |
| 26 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Transport manufacturing and repair<br>Date of Mapping: 1909 - 1956 | A13NE<br>(NE) | 223 | 1 | 387217<br>397267 |
| 27 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1895 | A13NE<br>(NE) | 223 | 1 | 387217<br>397267 |
| 28 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1993 | A13NE<br>(NE) | 225 | 1 | 387218<br>397268 |
| 29 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Coal storage and depot<br>Date of Mapping: 1895 | A18SW<br>(N) | 234 | 1 | 386784<br>397335 |
| 30 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Oil, petroleum & gas refining & storage<br>Date of Mapping: 1923 | A12NE<br>(NW) | 245 | 1 | 386476<br>397166 |
| 31 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Railways<br>Date of Mapping: 1848 - 1993 | A12SE<br>(SW) | 247 | 1 | 386532<br>396684 |
| 32 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1895 - 1923 | A14NW<br>(E) | 257 | 1 | 387330<br>397130 |
| 33 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1923 | A14NW<br>(E) | 262 | 1 | 387356<br>397062 |
| 34 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1993 | A8NW<br>(S) | 293 | 1 | 386846<br>396580 |
| 35 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Railways<br>Date of Mapping: 1895 - 1993 | A14NW<br>(NE) | 296 | 1 | 387347<br>397206 |
| 36 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Metal casting/foundries<br>Date of Mapping: 1923 | A14NW<br>(E) | 302 | 1 | 387410<br>397006 |
| 37 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Road haulage<br>Date of Mapping: 1956 - 1993 | A12SE<br>(W) | 347 | 1 | 386329<br>396959 |
| 38 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Dyes & pigments [manufacture]<br>Date of Mapping: 1848 | A18SE<br>(N) | 348 | 1 | 386974<br>397489 |
| 39 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Railways<br>Date of Mapping: 1895 - 1923 | A12NE<br>(W) | 349 | 1 | 386322<br>396998 |
| 40 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Railways<br>Date of Mapping: 1895 - 1956 | A18SW<br>(NW) | 356 | 1 | 386611<br>397369 |
| 41 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Machinery: engines, building and general industrial [manufacture]<br>Date of Mapping: 1895 - 1923 | A14NW<br>(NE) | 372 | 1 | 387411<br>397248 |
| 42 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Quarrying of sand & clay, operation of sand & gravel pits<br>Date of Mapping: 1848 | A19SW<br>(NE) | 377 | 1 | 387278<br>397413 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 42 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Clay bricks & tiles [manufacture]<br>Date of Mapping: 1848 | A19SW<br>(NE) | 419 | 1 | 387321<br>397434 |
| 43 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Railways<br>Date of Mapping: 1848 - 1993 | A7NE<br>(SW) | 385 | 1 | 386404<br>396623 |
| 44 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Machinery: engines, building and general industrial [manufacture]<br>Date of Mapping: 1923 | A9NW<br>(SE) | 397 | 1 | 387266<br>396602 |
| 45 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Metal casting/foundries<br>Date of Mapping: 1909 | A9NW<br>(SE) | 400 | 1 | 387268<br>396600 |
| 46 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Gas manufacture & distribution<br>Date of Mapping: 1909 - 1923 | A17SE<br>(NW) | 407 | 1 | 386433<br>397347 |
| 47 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Clay bricks & tiles [manufacture]<br>Date of Mapping: 1848 | A18SW<br>(N) | 412 | 1 | 386850<br>397543 |
| 48 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Railways<br>Date of Mapping: 1895 - 1993 | A14NW<br>(E) | 416 | 1 | 387477<br>397193 |
| 49 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Clay bricks & tiles [manufacture]<br>Date of Mapping: 1848 | A17SE<br>(NW) | 443 | 1 | 386543<br>397442 |
| 50 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1923 | A18SW<br>(NW) | 446 | 1 | 386631<br>397487 |
| 51 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Road haulage<br>Date of Mapping: 1909 - 1923 | A14SW<br>(E) | 455 | 1 | 387565<br>396989 |
| 52 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Metal casting/foundries<br>Date of Mapping: 1895 - 1923 | A9NW<br>(SE) | 460 | 1 | 387371<br>396589 |
| 53 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Transport : light manufacture<br>Date of Mapping: 1923 - 1956 | A12SW<br>(W) | 496 | 1 | 386200<br>396847 |
| 54 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Heap, unknown constituents<br>Date of Mapping: 1956 | A14NW<br>(NE) | 498 | 1 | 387533<br>397286 |
| 55 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1993 | A12SW<br>(W) | 500 | 1 | 386197<br>396845 |
| 56 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Metal casting/foundries<br>Date of Mapping: 1895 - 1909 | A12NW<br>(W) | 504 | 1 | 386183<br>397143 |
| 57 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1956 - 1993 | A14NW<br>(E) | 512 | 1 | 387563<br>397242 |
| 58 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Chemical manufacturing general<br>Date of Mapping: 1848 | A19SW<br>(NE) | 524 | 1 | 387478<br>397429 |
| 59 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Quarrying of sand & clay, operation of sand & gravel pits<br>Date of Mapping: 1848 | A19SW<br>(NE) | 540 | 1 | 387323<br>397576 |
| 60 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Mineral railway<br>Date of Mapping: 1895 - 1923 | A8NE<br>(SE) | 555 | 1 | 387203<br>396404 |
| 61 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Motor vehicles: maintenance & repair e.g. garages<br>Date of Mapping: 1993 | A8NE<br>(SE) | 568 | 1 | 387158<br>396389 |
| 62 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Sawmilling, planing & impregnation [i.e. treatment of timber]<br>Date of Mapping: 1895 | A12SW<br>(W) | 609 | 1 | 386065<br>396954 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 63 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Oil, petroleum & gas refining & storage<br>Date of Mapping: 1895 - 1923 | A8SW<br>(S) | 625 | 1 | 386878<br>396243 |
| 64 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Machinery: engines, building and general industrial [manufacture]<br>Date of Mapping: 1923 | A14SE<br>(E) | 626 | 1 | 387736<br>396943 |
| 65 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Chemical manufacturing general<br>Date of Mapping: 1909 | A14SE<br>(E) | 637 | 1 | 387746<br>396925 |
| 66 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Cement, lime & plaster products [manufacture]<br>Date of Mapping: 1848 | A17SE<br>(NW) | 652 | 1 | 386365<br>397593 |
| 66 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Mining & quarrying general<br>Date of Mapping: 1848 | A17SE<br>(NW) | 656 | 1 | 386379<br>397605 |
| 67 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Chemical manufacturing general<br>Date of Mapping: 1848 | A18NE<br>(NE) | 655 | 1 | 387202<br>397755 |
| 68 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Road haulage<br>Date of Mapping: 1993 | A17SE<br>(NW) | 656 | 1 | 386219<br>397493 |
| 69 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Mineral railway<br>Date of Mapping: 1848 | A17SE<br>(NW) | 662 | 1 | 386364<br>397603 |
| 70 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Gas manufacture & distribution<br>Date of Mapping: 1909 - 1923 | A14SE<br>(E) | 677 | 1 | 387784<br>396899 |
| 71 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Clay bricks & tiles [manufacture]<br>Date of Mapping: 1895 | A17SE<br>(NW) | 681 | 1 | 386333<br>397609 |
| 72 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Brewing & malting<br>Date of Mapping: 1895 - 1923 | A9NW<br>(SE) | 689 | 1 | 387430<br>396358 |
| 73 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1923 | A7SE<br>(SW) | 692 | 1 | 386293<br>396302 |
| 74 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Road haulage<br>Date of Mapping: 1909 - 1993 | A12NW<br>(W) | 696 | 1 | 385977<br>397059 |
| 75 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Road haulage<br>Date of Mapping: 1993 | A14SE<br>(E) | 721 | 1 | 387805<br>396772 |
| 76 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Railways<br>Date of Mapping: 1895 - 1956 | A17SW<br>(NW) | 750 | 1 | 386023<br>397397 |
| 77 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Metal casting/foundries<br>Date of Mapping: 1956 | A14NE<br>(E) | 753 | 1 | 387819<br>397227 |
| 78 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1956 - 1993 | A14SE<br>(E) | 761 | 1 | 387823<br>396698 |
| 79 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Road haulage<br>Date of Mapping: 1993 | A12NW<br>(W) | 763 | 1 | 385938<br>397229 |
| 80 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Brewing & malting<br>Date of Mapping: 1923 | A7NW<br>(SW) | 768 | 1 | 386039<br>396486 |
| 81 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1923 | A7SE<br>(SW) | 773 | 1 | 386309<br>396193 |
| 82 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Clay bricks & tiles [manufacture]<br>Date of Mapping: 1848 | A17SW<br>(W) | 778 | 1 | 385973<br>397361 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 82 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Road haulage<br>Date of Mapping: 1993 | A17SW<br>(W) | 795 | 1 | 385943<br>397339 |
| 83 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Brewing & malting<br>Date of Mapping: 1923 | A7NW<br>(SW) | 784 | 1 | 385968<br>396607 |
| 84 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1993 | A19NW<br>(NE) | 789 | 1 | 387383<br>397823 |
| 85 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1923 - 1956 | A19NE<br>(NE) | 816 | 1 | 387632<br>397690 |
| 86 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Sawmilling, planing & impregnation [i.e. treatment of timber]<br>Date of Mapping: 1895 | A11NE<br>(W) | 837 | 1 | 385834<br>397012 |
| 87 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1993 | A19SE<br>(NE) | 839 | 1 | 387847<br>397420 |
| 88 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1956 - 1993 | A15NW<br>(E) | 840 | 1 | 387918<br>397202 |
| 89 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1993 | A8SW<br>(S) | 855 | 1 | 386636<br>395997 |
| 90 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Clay bricks & tiles [manufacture]<br>Date of Mapping: 1895 | A19NE<br>(NE) | 857 | 1 | 387698<br>397683 |
| 91 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Cement, lime & plaster products [manufacture]<br>Date of Mapping: 1848 | A17NW<br>(NW) | 874 | 1 | 386185<br>397744 |
| 91 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Mining & quarrying general<br>Date of Mapping: 1848 | A17NW<br>(NW) | 894 | 1 | 386171<br>397757 |
| 92 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Chemical manufacturing general<br>Date of Mapping: 1909 - 1923 | A19NW<br>(NE) | 892 | 1 | 387359<br>397945 |
| 93 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Cemetery or Graveyard<br>Date of Mapping: 1848 | A17SW<br>(NW) | 897 | 1 | 385973<br>397582 |
| 94 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Cemetery or Graveyard<br>Date of Mapping: 1848 - 1956 | A11NE<br>(W) | 898 | 1 | 385774<br>397046 |
| 95 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Dyes & pigments [manufacture]<br>Date of Mapping: 1848 - 1923 | A19NE<br>(NE) | 899 | 1 | 387671<br>397768 |
| 96 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Hospitals<br>Date of Mapping: 1895 - 1956 | A11SE<br>(W) | 901 | 1 | 385771<br>396979 |
| 97 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Transport : light manufacture<br>Date of Mapping: 1923 | A19NW<br>(NE) | 932 | 1 | 387530<br>397911 |
| 98 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Mining of coal & lignite<br>Date of Mapping: 1848 | A19NW<br>(NE) | 934 | 1 | 387416<br>397966 |
| 99 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1993 | A15SW<br>(E) | 968 | 1 | 388060<br>396778 |
| 100 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Metal casting/foundries<br>Date of Mapping: 1895 - 1956 | A15SW<br>(E) | 970 | 1 | 388063<br>396785 |
| 101 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Brewing & malting<br>Date of Mapping: 1895 | A23SW<br>(N) | 979 | 1 | 386658<br>398083 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 102 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Factory or works - use not specified<br>Date of Mapping: 1993 | A19NE<br>(NE) | 995 | 1 | 387824<br>397748 |
| 103 | **Potentially Contaminative Industrial Uses (Past Land Use)**<br>Use: Clay bricks & tiles [manufacture]<br>Date of Mapping: 1895 | A17NW<br>(NW) | 999 | 1 | 386080<br>397823 |
| 104 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A13NW<br>(N) | 15 | 1 | 386868<br>397140 |
| 105 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A13NW<br>(NW) | 76 | 1 | 386806<br>397130 |
| 106 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A19SW<br>(NE) | 377 | 1 | 387278<br>397413 |
| 107 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A18SW<br>(N) | 412 | 1 | 386850<br>397543 |
| 108 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A19SW<br>(NE) | 419 | 1 | 387321<br>397434 |
| 109 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A17SE<br>(NW) | 443 | 1 | 386543<br>397442 |
| 110 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A19SW<br>(NE) | 540 | 1 | 387323<br>397576 |
| 111 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A17SE<br>(NW) | 656 | 1 | 386379<br>397605 |
| 112 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A17SE<br>(NW) | 681 | 1 | 386333<br>397609 |
| 113 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A17SW<br>(W) | 778 | 1 | 385973<br>397361 |
| 114 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A19NE<br>(NE) | 857 | 1 | 387698<br>397683 |
| 115 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A17NW<br>(NW) | 894 | 1 | 386171<br>397757 |
| 116 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A19NW<br>(NE) | 934 | 1 | 387416<br>397966 |
| 117 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A17NW<br>(NW) | 999 | 1 | 386080<br>397823 |
| 118 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A13NE<br>(N) | 0 | 1 | 386922<br>397115 |
| 119 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13SE<br>(SE) | 0 | 1 | 386984<br>396936 |
| 120 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13SE<br>(E) | 0 | 1 | 386980<br>396964 |
| 121 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13NE<br>(E) | 0 | 1 | 387001<br>397011 |
| 122 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A13NE<br>(N) | 0 | 1 | 386896<br>397048 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 123 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1956 | A13NE<br>(NE) | 1 | 1 | 387075<br>397086 |
| 124 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A13NW<br>(W) | 32 | 1 | 386641<br>397028 |
| 125 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A13NW<br>(NW) | 33 | 1 | 386779<br>397069 |
| 126 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A13NW<br>(W) | 33 | 1 | 386663<br>397052 |
| 127 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13SE<br>(E) | 33 | 1 | 387092<br>396928 |
| 128 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13SE<br>(SE) | 42 | 1 | 386999<br>396889 |
| 129 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13SE<br>(S) | 60 | 1 | 386908<br>396843 |
| 130 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A13NW<br>(W) | 64 | 1 | 386619<br>397055 |
| 131 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13SE<br>(E) | 80 | 1 | 387174<br>396920 |
| 132 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A13NW<br>(NW) | 87 | 1 | 386644<br>397101 |
| 133 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13SE<br>(S) | 90 | 1 | 386926<br>396817 |
| 134 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A13NE<br>(NE) | 114 | 1 | 387102<br>397207 |
| 135 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13SE<br>(SE) | 116 | 1 | 387037<br>396823 |
| 136 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12NE<br>(W) | 126 | 1 | 386549<br>397045 |
| 137 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A13NE<br>(NE) | 130 | 1 | 387127<br>397215 |
| 138 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A13NW<br>(NW) | 157 | 1 | 386689<br>397198 |
| 139 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SE<br>(W) | 174 | 1 | 386531<br>396849 |
| 140 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SE<br>(SW) | 192 | 1 | 386522<br>396823 |
| 141 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12NE<br>(W) | 211 | 1 | 386498<br>397139 |
| 142 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13NE<br>(NE) | 220 | 1 | 387187<br>397285 |
| 143 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A18SW<br>(N) | 245 | 1 | 386881<br>397379 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 144 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14NW<br>(E) | 266 | 1 | 387337<br>397135 |
| 145 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8NW<br>(SW) | 296 | 1 | 386696<br>396553 |
| 146 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8NW<br>(S) | 300 | 1 | 386798<br>396558 |
| 147 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13NW<br>(NW) | 305 | 1 | 386562<br>397320 |
| 148 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14SW<br>(SE) | 326 | 1 | 387366<br>396765 |
| 149 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14SW<br>(SE) | 331 | 1 | 387382<br>396779 |
| 150 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12NE<br>(W) | 336 | 1 | 386388<br>397198 |
| 151 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A18SE<br>(N) | 342 | 1 | 387011<br>397480 |
| 152 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14NW<br>(NE) | 342 | 1 | 387331<br>397320 |
| 153 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SE<br>(W) | 343 | 1 | 386359<br>396837 |
| 154 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SE<br>(SW) | 350 | 1 | 386374<br>396765 |
| 155 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8NE<br>(S) | 377 | 1 | 387046<br>396554 |
| 156 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8NW<br>(S) | 379 | 1 | 386834<br>396486 |
| 157 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SE<br>(W) | 382 | 1 | 386338<br>396773 |
| 158 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SE<br>(W) | 407 | 1 | 386308<br>396782 |
| 159 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A12NE<br>(W) | 411 | 1 | 386260<br>397046 |
| 160 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7NE<br>(SW) | 413 | 1 | 386547<br>396473 |
| 161 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A19SW<br>(NE) | 438 | 1 | 387405<br>397382 |
| 162 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SE<br>(W) | 440 | 1 | 386256<br>396854 |
| 163 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9NW<br>(SE) | 442 | 1 | 387381<br>396618 |
| 164 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A19SW<br>(NE) | 447 | 1 | 387373<br>397428 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 165 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SE<br>(W) | 453 | 1 | 386239<br>396873 |
| 166 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8NE<br>(S) | 456 | 1 | 386999<br>396456 |
| 167 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9NW<br>(SE) | 458 | 1 | 387229<br>396526 |
| 168 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8NE<br>(S) | 458 | 1 | 387049<br>396470 |
| 169 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8NW<br>(S) | 469 | 1 | 386804<br>396386 |
| 170 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8NE<br>(S) | 483 | 1 | 387014<br>396433 |
| 171 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A18SE<br>(N) | 489 | 1 | 387115<br>397609 |
| 172 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8NE<br>(S) | 506 | 1 | 386933<br>396384 |
| 173 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A18SW<br>(NW) | 507 | 1 | 386603<br>397543 |
| 174 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SW<br>(W) | 508 | 1 | 386169<br>396941 |
| 175 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12NW<br>(W) | 514 | 1 | 386162<br>397091 |
| 176 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A17SE<br>(NW) | 518 | 1 | 386549<br>397521 |
| 177 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A19SW<br>(NE) | 518 | 1 | 387244<br>397586 |
| 178 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7NE<br>(SW) | 528 | 1 | 386379<br>396443 |
| 179 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8SW<br>(S) | 538 | 1 | 386739<br>396310 |
| 180 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SW<br>(W) | 541 | 1 | 386159<br>396828 |
| 181 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14NE<br>(E) | 555 | 1 | 387659<br>397052 |
| 182 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A19SW<br>(NE) | 562 | 1 | 387317<br>397604 |
| 183 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A9NE<br>(SE) | 587 | 1 | 387605<br>396652 |
| 184 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A19SE<br>(NE) | 591 | 1 | 387591<br>397381 |
| 185 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12NW<br>(W) | 624 | 1 | 386047<br>397017 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 186 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9NE<br>(SE) | 626 | 1 | 387572<br>396546 |
| 187 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8SE<br>(S) | 627 | 1 | 387052<br>396294 |
| 188 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9NW<br>(SE) | 645 | 1 | 387376<br>396380 |
| 189 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A9NE<br>(SE) | 649 | 1 | 387567<br>396506 |
| 190 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A19SE<br>(NE) | 659 | 1 | 387674<br>397364 |
| 191 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A19NW<br>(NE) | 675 | 1 | 387344<br>397715 |
| 192 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14SE<br>(E) | 682 | 1 | 387792<br>396962 |
| 193 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A18NW<br>(N) | 693 | 1 | 386833<br>397825 |
| 194 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7NW<br>(SW) | 700 | 1 | 386209<br>396367 |
| 195 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7SE<br>(SW) | 709 | 1 | 386246<br>396319 |
| 196 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A18NE<br>(N) | 716 | 1 | 387215<br>397815 |
| 197 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A17SW<br>(NW) | 728 | 1 | 386054<br>397403 |
| 198 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SW<br>(W) | 730 | 1 | 385998<br>396689 |
| 199 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8SW<br>(S) | 733 | 1 | 386638<br>396120 |
| 200 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A19NW<br>(NE) | 742 | 1 | 387537<br>397675 |
| 201 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7SW<br>(SW) | 759 | 1 | 386212<br>396282 |
| 202 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7NW<br>(SW) | 762 | 1 | 386123<br>396371 |
| 203 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9NE<br>(SE) | 763 | 1 | 387770<br>396585 |
| 204 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8SE<br>(S) | 767 | 1 | 386913<br>396105 |
| 205 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14SE<br>(E) | 778 | 1 | 387887<br>396913 |
| 206 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9NE<br>(SE) | 778 | 1 | 387771<br>396556 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 207 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7NW<br>(SW) | 784 | 1 | 386094<br>396372 |
| 208 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7SW<br>(SW) | 784 | 1 | 386195<br>396264 |
| 209 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A17NE<br>(NW) | 788 | 1 | 386243<br>397679 |
| 210 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8SE<br>(SE) | 792 | 1 | 387225<br>396174 |
| 211 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1956 | A15SW<br>(E) | 800 | 1 | 387909<br>396918 |
| 212 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A8SE<br>(S) | 804 | 1 | 387080<br>396117 |
| 213 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A18NW<br>(N) | 806 | 1 | 386622<br>397889 |
| 214 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14NE<br>(E) | 809 | 1 | 387859<br>397286 |
| 215 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9NE<br>(E) | 834 | 1 | 387868<br>396619 |
| 216 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A9SW<br>(SE) | 843 | 1 | 387311<br>396147 |
| 217 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1956 | A9SW<br>(SE) | 846 | 1 | 387256<br>396128 |
| 218 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A18NW<br>(N) | 866 | 1 | 386685<br>397973 |
| 219 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8SE<br>(S) | 867 | 1 | 387211<br>396092 |
| 220 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A19NW<br>(NE) | 875 | 1 | 387291<br>397956 |
| 221 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9NE<br>(SE) | 890 | 1 | 387901<br>396559 |
| 222 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9NE<br>(SE) | 895 | 1 | 387874<br>396501 |
| 223 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9SW<br>(SE) | 896 | 1 | 387313<br>396093 |
| 224 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A15NW<br>(E) | 906 | 1 | 387972<br>397248 |
| 225 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A17SW<br>(NW) | 907 | 1 | 385906<br>397505 |
| 226 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1956 | A9SE<br>(SE) | 911 | 1 | 387699<br>396269 |
| 227 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A10NW<br>(E) | 912 | 1 | 387965<br>396647 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 228 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9SW<br>(SE) | 913 | 1 | 387524<br>396154 |
| 229 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7SW<br>(SW) | 915 | 1 | 385977<br>396309 |
| 230 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1956 | A9SW<br>(SE) | 915 | 1 | 387498<br>396139 |
| 231 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8SE<br>(S) | 916 | 1 | 387054<br>395992 |
| 232 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A23SW<br>(N) | 929 | 1 | 386877<br>398065 |
| 233 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7SW<br>(SW) | 937 | 1 | 385973<br>396280 |
| 234 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A15SW<br>(E) | 939 | 1 | 388045<br>396879 |
| 235 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9SW<br>(SE) | 949 | 1 | 387464<br>396088 |
| 236 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1956 | A9SE<br>(SE) | 983 | 1 | 387632<br>396135 |
| 237 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A15NW<br>(E) | 984 | 1 | 388028<br>397329 |
| 238 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A23SW<br>(N) | 987 | 1 | 386576<br>398066 |
| 239 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A19NE<br>(NE) | 996 | 1 | 387793<br>397785 |

# Historical Tanks and Energy Facilities

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 240 | **Electrical Sub Station Facilities**<br>Scale of Mapping: 1:1,250<br>Date of Mapping: 1949 | A13SW<br>(W) | 0 | 1 | 386775<br>396968 |
| 240 | **Electrical Sub Station Facilities**<br>Scale of Mapping: 1:2,500<br>Date of Mapping: 1951 | A13SW<br>(W) | 0 | 1 | 386776<br>396963 |
| 241 | **Electrical Sub Station Facilities**<br>Scale of Mapping: 1:1,250<br>Date of Mapping: 1949 | A13SW<br>(S) | 0 | 1 | 386881<br>396969 |
| 241 | **Electrical Sub Station Facilities**<br>Scale of Mapping: 1:2,500<br>Date of Mapping: 1951 | A13SW<br>(S) | 0 | 1 | 386884<br>396972 |
| 242 | **Electrical Sub Station Facilities**<br>Scale of Mapping: 1:2,500<br>Date of Mapping: 1951 | A13SE<br>(E) | 0 | 1 | 387054<br>396963 |
| 242 | **Electrical Sub Station Facilities**<br>Scale of Mapping: 1:1,250<br>Date of Mapping: 1950 | A13SE<br>(E) | 0 | 1 | 387065<br>396957 |
| 242 | **Electrical Sub Station Facilities**<br>Scale of Mapping: 1:1,250<br>Date of Mapping: 1979 | A13SE<br>(E) | 0 | 1 | 387064<br>396957 |
| 243 | **Electrical Sub Station Facilities**<br>Scale of Mapping: 1:2,500<br>Date of Mapping: 1951 | A13NE<br>(NE) | 78 | 1 | 387141<br>397132 |
| 243 | **Electrical Sub Station Facilities**<br>Scale of Mapping: 1:1,250<br>Date of Mapping: 1948 | A13NE<br>(NE) | 81 | 1 | 387145<br>397132 |
| 243 | **Electrical Sub Station Facilities**<br>Scale of Mapping: 1:1,250<br>Date of Mapping: 1990 | A13NE<br>(NE) | 83 | 1 | 387151<br>397122 |
| 244 | **Electrical Sub Station Facilities**<br>Scale of Mapping: 1:1,250<br>Date of Mapping: 1975 | A13NW<br>(W) | 90 | 1 | 386590<br>397056 |
| 245 | **Gas Industry Facilities**<br>Scale of Mapping: 1:2,500<br>Date of Mapping: 1950 - 1967 | A13NW<br>(NW) | 37 | 1 | 386822<br>397066 |
| 246 | **Tanks**<br>Scale of Mapping: 1:1,250<br>Date of Mapping: 1948 | A13NE<br>(NE) | 0 | 1 | 386958<br>397092 |
| 246 | **Tanks**<br>Scale of Mapping: 1:2,500<br>Date of Mapping: 1950 | A13NE<br>(NE) | 0 | 1 | 386960<br>397093 |
| 247 | **Tanks**<br>Scale of Mapping: 1:1,250<br>Date of Mapping: 1975 | A13NW<br>(W) | 0 | 1 | 386802<br>397019 |
| 247 | **Tanks**<br>Scale of Mapping: 1:1,250<br>Date of Mapping: 1948 - 1953 | A13NW<br>(NW) | 21 | 1 | 386799<br>397048 |
| 247 | **Tanks**<br>Scale of Mapping: 1:2,500<br>Date of Mapping: 1950 - 1967 | A13NW<br>(NW) | 21 | 1 | 386799<br>397048 |
| 248 | **Tanks**<br>Scale of Mapping: 1:1,250<br>Date of Mapping: 1948 - 1953 | A13NW<br>(W) | 0 | 1 | 386712<br>397013 |
| 248 | **Tanks**<br>Scale of Mapping: 1:2,500<br>Date of Mapping: 1950 - 1967 | A13NW<br>(W) | 0 | 1 | 386709<br>397012 |
| 249 | **Tanks**<br>Scale of Mapping: 1:1,250<br>Date of Mapping: 1948 | A13NE<br>(NE) | 12 | 1 | 387049<br>397110 |
| 249 | **Tanks**<br>Scale of Mapping: 1:2,500<br>Date of Mapping: 1951 | A13NE<br>(NE) | 12 | 1 | 387049<br>397109 |

# Historical Tanks and Energy Facilities

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 250 | **Tanks**<br>Scale of Mapping: 1:2,500<br>Date of Mapping: 1967 | A13NW<br>(N) | 22 | 1 | 386877<br>397114 |
| 250 | **Tanks**<br>Scale of Mapping: 1:1,250<br>Date of Mapping: 1953 | A13NW<br>(N) | 23 | 1 | 386877<br>397115 |
| 251 | **Tanks**<br>Scale of Mapping: 1:1,250<br>Date of Mapping: 1948 | A13NE<br>(E) | 46 | 1 | 387128<br>397068 |
| 251 | **Tanks**<br>Scale of Mapping: 1:2,500<br>Date of Mapping: 1951 | A13NE<br>(E) | 49 | 1 | 387130<br>397071 |
| 251 | **Tanks**<br>Scale of Mapping: 1:1,250<br>Date of Mapping: 1948 | A13NE<br>(NE) | 58 | 1 | 387131<br>397097 |

**No Historical Building Plans information available.**

**The following mapping has been analysed for Historical Land Use Information:**

| **1:10,560** | **Mapsheet** | **Published Date** |
|---|---|---|
| Lancashire And Furness | 104_00 | 1848 |
| Cheshire | 003A_00 | 1882 |
| Cheshire | 010_00 | 1882 |
| Lancashire And Furness | 104_NE | 1894 |
| Lancashire And Furness | 104_SE | 1895 |
| Cheshire | 003A_SE | 1899 |
| Cheshire | 010_NE | 1899 |
| Lancashire And Furness | 104_NE | 1909 |
| Lancashire And Furness | 104_SE | 1909 |
| Cheshire | 003A_SE | 1911 |
| Cheshire | 010_NE | 1911 |
| Lancashire And Furness | 104_NE | 1923 |
| Lancashire And Furness | 104_SE | 1923 |
| Cheshire | 003A_SE | 1938 |
| Cheshire | 010_NE | 1938 |
| Ordnance Survey Plan | SJ89NE | 1956 |
| **1:10,000** | **Mapsheet** | **Published Date** |
| Ordnance Survey Plan | SJ89NE | 1993 |

**The following mapping has been analysed for Historical Tanks and Energy Facilities:**

| 1:2,500 | Mapsheet | Published Date |
|---|---|---|
| Ordnance Survey Plan | SJ8697 | 1950 |
| Ordnance Survey Plan | SJ8696 | 1951 |
| Ordnance Survey Plan | SJ8796 | 1951 |
| Ordnance Survey Plan | SJ8797 | 1951 |
| Ordnance Survey Plan | SJ8696 | 1964 |
| Ordnance Survey Plan | SJ8796 | 1964 |
| Ordnance Survey Plan | SJ8697 | 1967 |
| Ordnance Survey Plan | SJ8797 | 1967 |
| **1:1,250** | **Mapsheet** | **Published Date** |
| Ordnance Survey Plan | SJ8697SE | 1948 |
| Ordnance Survey Plan | SJ8797SW | 1948 |
| Ordnance Survey Plan | SJ8696NE | 1949 |
| Ordnance Survey Plan | SJ8796NW | 1950 |
| Ordnance Survey Plan | SJ8697SE | 1953 |
| Ordnance Survey Plan | SJ8696NE | 1957 |
| Ordnance Survey Plan | SJ8797SW | 1957 |
| Ordnance Survey Plan | SJ8697SE | 1975 |
| Ordnance Survey Plan | SJ8696NE | 1979 |
| Ordnance Survey Plan | SJ8796NW | 1979 |
| Ordnance Survey Plan | SJ8797SW | 1990 |

# Useful Contacts and Further Information

| Contact | Name and Address | Contact Details |
|---|---|---|
| **1** | **Landmark Information Group Limited**<br>Imperium, Imperial Way, Reading, Berkshire, RG2 0TD | Telephone: 0844 844 9952<br>Fax: 0844 844 9951<br>Email: customerservices@landmark.co.uk<br>Website: www.landmark.co.uk |

### Historical Building Plans Information

This data set contains potentially contaminative features such as asbestos, petrol, oil and tanks captured from Historical Building Plans. The Historical Building Plans were produced by the London-based firm Charles E. Goad Ltd. as fire insurance plans, dating back to 1885. The firm ceased production of fire insurance plans in 1970. Most of the important towns and cities of the British Isles are covered. Historical Building Plans are usually at the scales of 1:480 (1 inch to 40 feet) for the British Isles. They were updated every 5-6 years by means of revision sheets designed to be pasted on to the original plans.

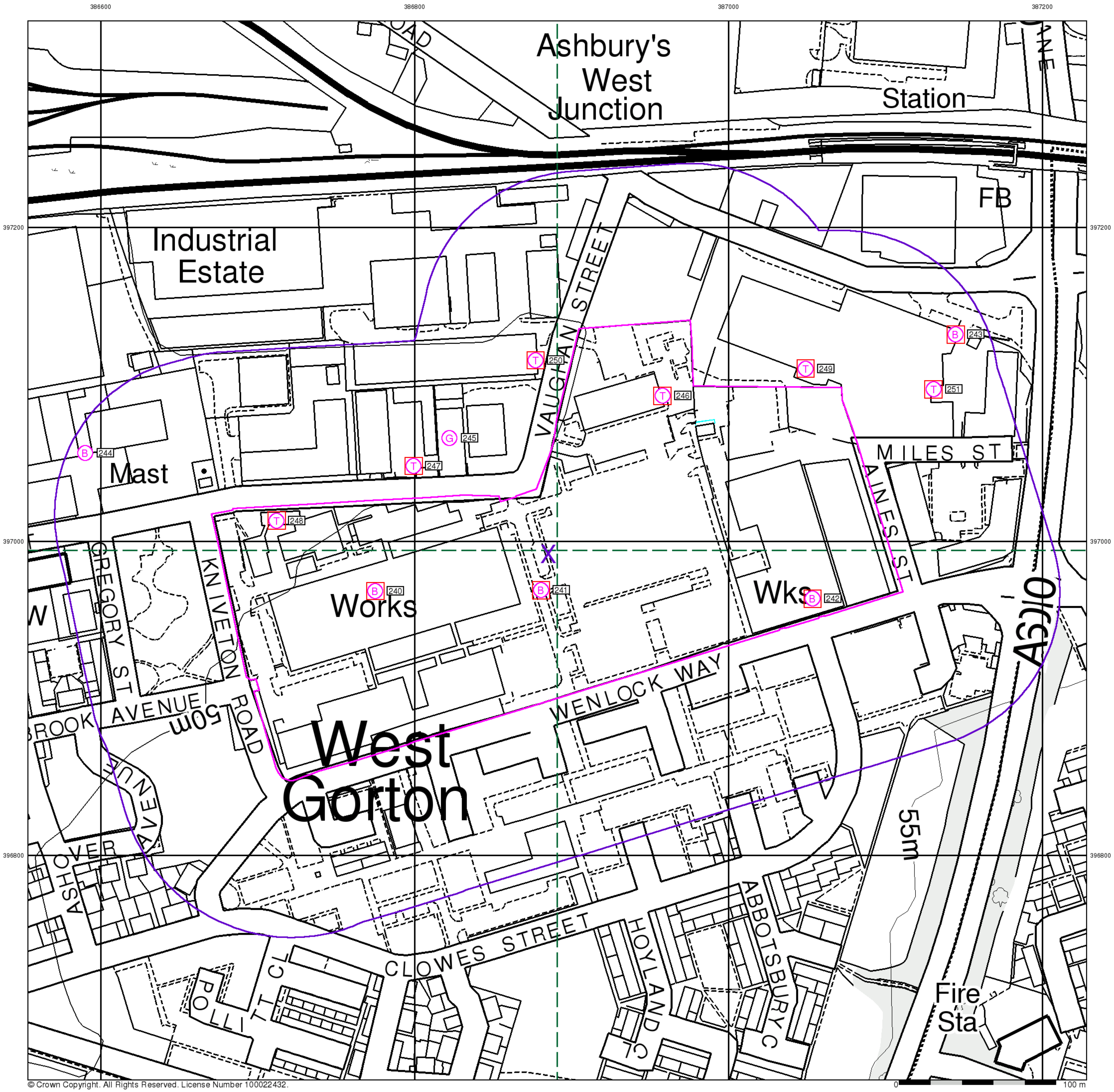
It should be noted that Historical Building Plans are only available for certain major towns and cities and in some cases there may only be partial coverage of the search area. It cannot therefore be assumed that the absence of responses under the Historical Building Plans section of this report indicates that no hazards exist. Please check the Historical Building Plans Map List table in the Historical Map List section of this report to establish if Historical Building Plans are available for this search area.

### Historical Land Use Information

Landmark's Historical Land Use Data is the result of combined analysis of historical map data captured at 1:10,560 and 1:10,000. A unique comprehensive database of Historic Land Use from the 1840's to 1996 it includes 67 different types of potentially contaminated past industrial land use. This entailed analysing over 60,000 maps and is drawn from at least four, and up to six historical map editions. In addition a seventh layer was also created, known as the land use layer, containing areas of infilled land which are plotted via comparison between two or more map editions.

### Historical Tanks and Energy Facilities

In addition to HLUD, additional analysis uncovered some of the most dangerous sources of contamination (past and present tanks, petrol storage, oil, gas, electricity, miscellaneous facilities). This data set covers over 390,000 Historical Tanks and Energy facilities in Great Britain and was captured from post war 1:2500 and 1:1250 Ordnance Survey historical mapping covering a period from 1943 to 1996.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KNIVETON ROAD
AVENUE
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**Envirocheck®**
Historical

## General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point
- 8 Map ID
- ☐ Several of Type at Location

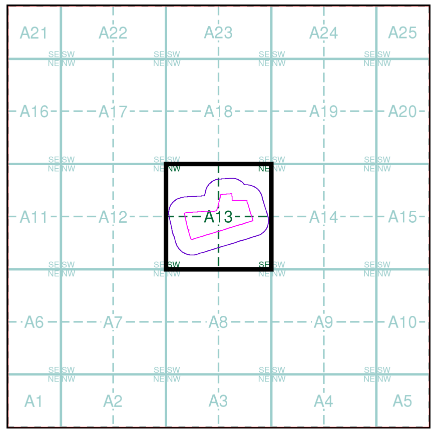
## Historical Building Plans

- ▨ Area Cleared due to Enemy Action
- ▲ Asbestos
- ▲ Above Ground Fuel Tanks
- ▲ Benzene/Benzole/Naphtha, Naphthalene/Kerosene
- ▲ Electricity Generation
- ▼ Electricity Sub-Stations
- ▲ Gas Industry
- ▶ Gas Storage
- ▼ Gas Use
- ▲ Oil Industry
- ▶ Oil Storage
- ▼ Oil Use
- ◀ Paint based Oils
- ▲ Paraffin
- ▲ Petrol and Diesel Industry
- ▶ Petrol and Diesel Storage
- ▼ Petrol and Diesel Use
- ▲ Potential Fuel Gas
- ▶ Potential Fuel Oil
- ▼ Potential Fuel Use
- ◀ Potential Petrol and Diesel
- ▲ Potential Tanks
- ▶ Potentially Fuel-related Tanks
- ▼ Underground Fuel Tanks

## Historical Tanks and Energy Facilities

- Ⓑ Electrical Sub Station Facility
- Ⓔ Electricity Industry Facility
- Ⓖ Gas Industry Facility
- Ⓥ Gas Monitoring Facility
- Ⓜ Miscellaneous Power Facility
- Ⓞ Oil Industry Facility
- Ⓢ Petroleum Storage Facility
- Ⓟ Potential Tank
- Ⓣ Tank

## Historical Data Report - Segment A13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## Order Details

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|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Plot Buffer (m): | 100 |

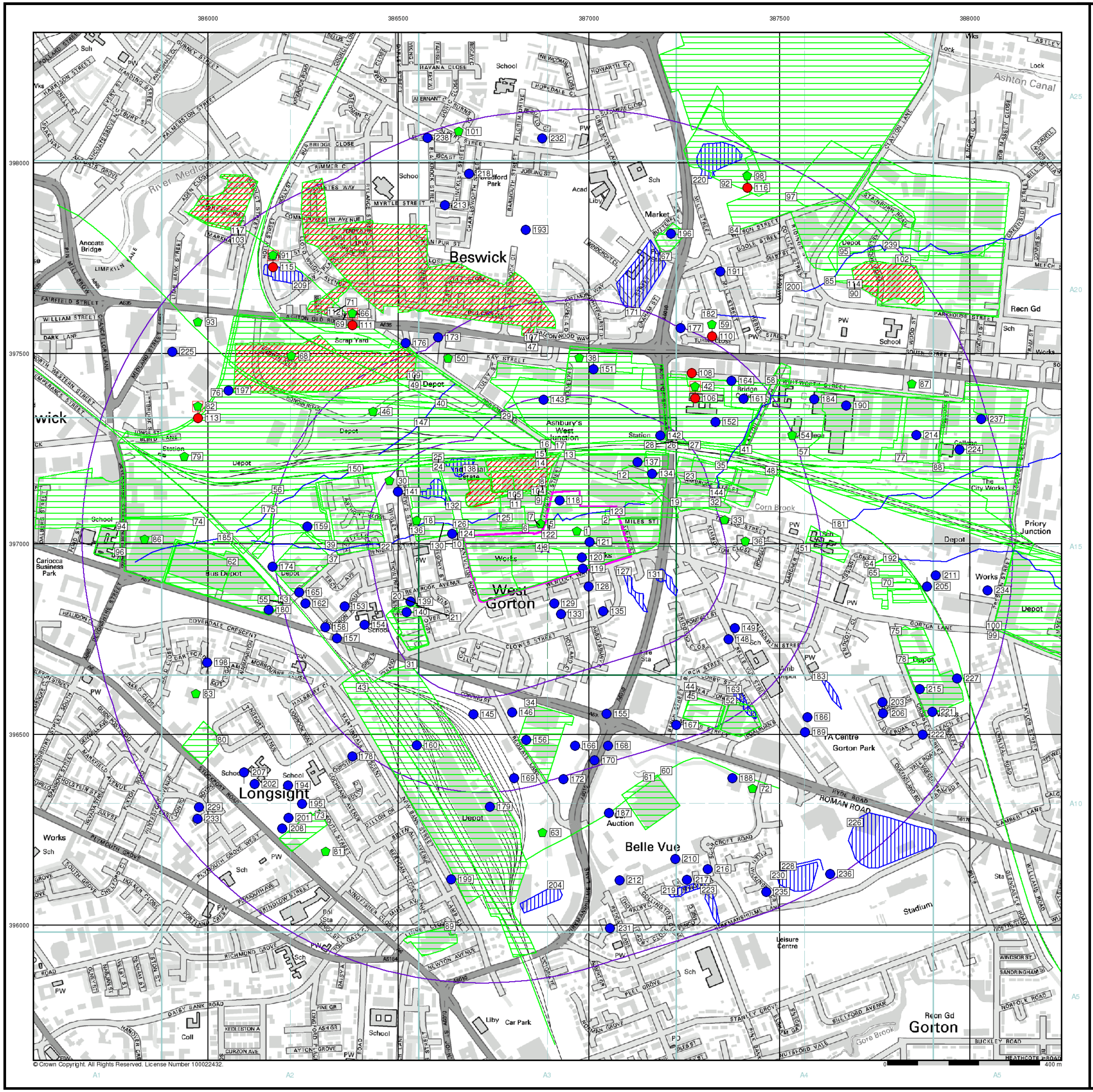
## Site Details

Site at 386930, 397100

**Landmark**
Information Group

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

A Landmark Information Group Service v47.0 24-Sep-2015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River Medlock
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Ardwick
Bradford Park
Ashbury's West Junction
Priory Junction
The City Works
Gorton Park
Hyde Road
Stadium
Carioca Business Park
Bus Depot
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**Envirocheck®**
**Historical**

## General

- ⬠ Specified Site
- ⬠ Specified Buffer(s)
- X Bearing Reference Point
- 8 Map ID
- ☐ Several of Type at Location

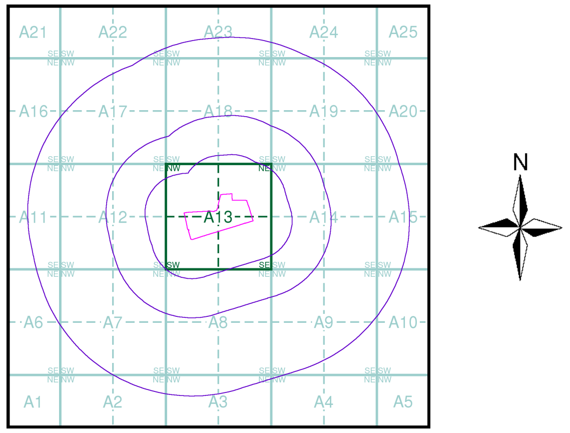
## Historical Building Plans

- ▨ Area Cleared due to Enemy Action

## Historical Land Use

- ✠ Former Marsh
- ▨ Historical Flood Liability
- ✚ Historical Flood Liability (Location)
- ▤ Potentially Contaminative Industrial Use (Past Land Use)
- — Potentially Contaminative Industrial Use (Past Land Use) (Linear)
- ⬟ Potentially Contaminative Industrial Use (Past Land Use) (Location)
- ▨ Potentially Infilled Land (Non-Water)
- — Potentially Infilled Land (Non-Water) (Linear)
- ● Potentially Infilled Land (Non-Water) (Location)
- ▥ Potentially Infilled Land (Water)
- — Potentially Infilled Land (Water) (Linear)
- ● Potentially Infilled Land (Water) (Location)

## Historical Data Report - Slice Map A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## Order Details

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|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

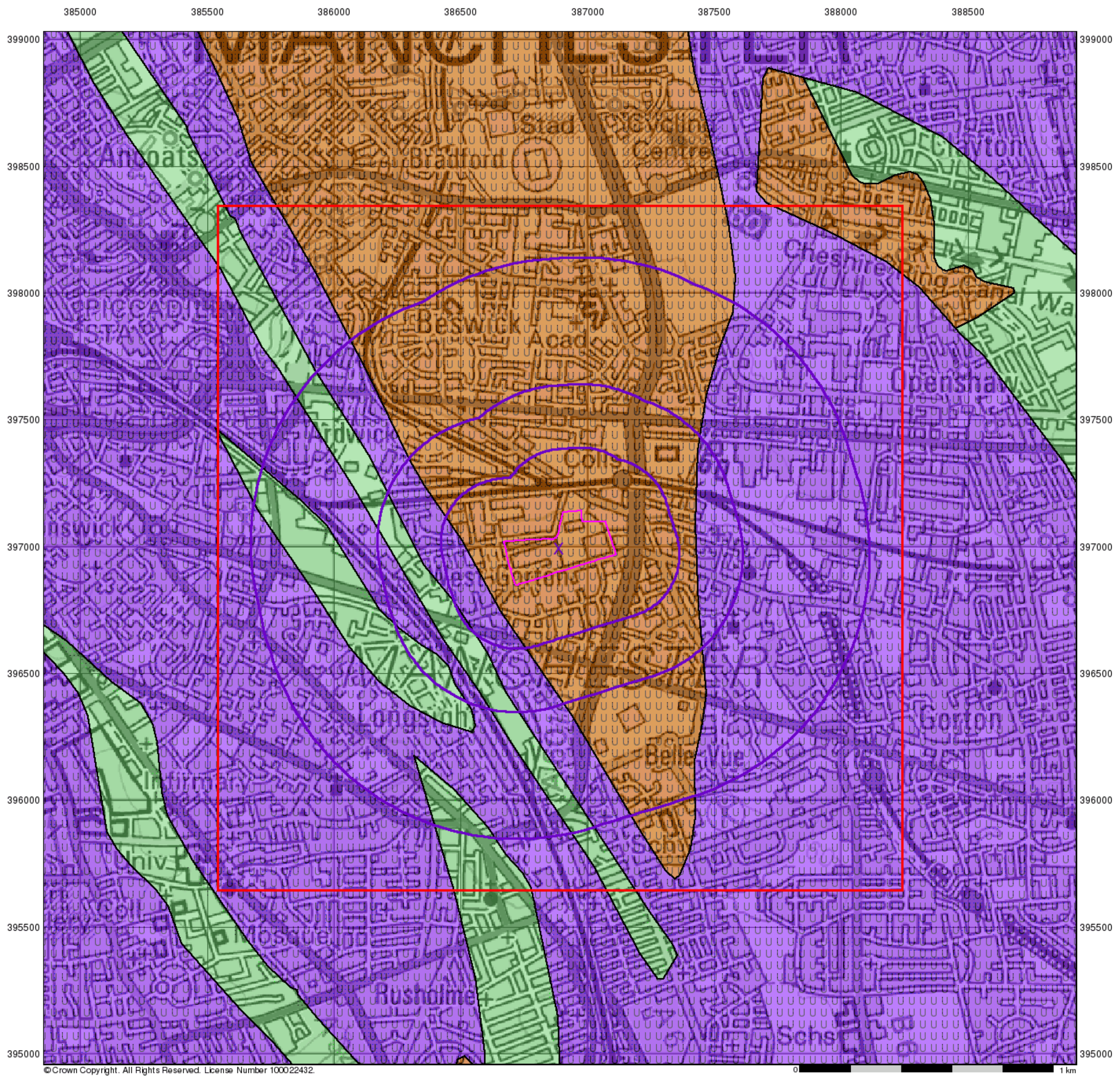
Site at 386930, 397100

**Landmark**
Information Group

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

# APPENDIX 4

# ENVIRONMENTAL MAPS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Envirocheck®

# Groundwater Vulnerability

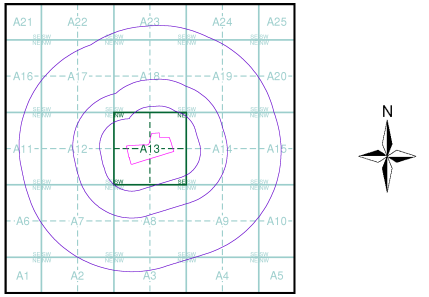
## General

| | | |
|---|---|---|
| Specified Site | Specified Buffer(s) | X Bearing Reference Point |
| ☐ Slice | 8 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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## Order Details

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|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

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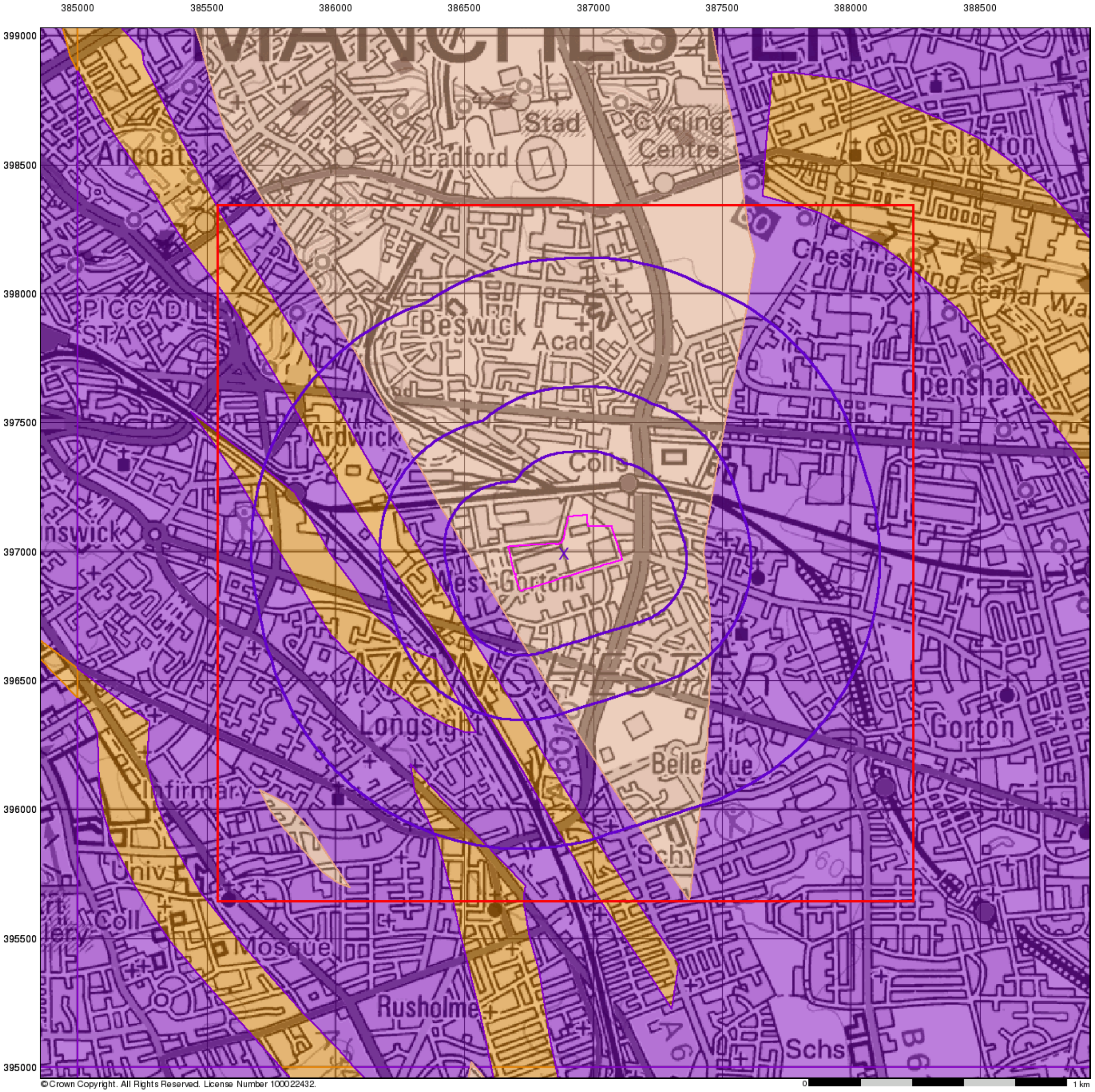
Information Group

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

# Bedrock Aquifer Designation

## General

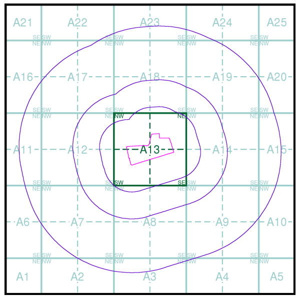
Specified Site
Specified Buffer(s)
X Bearing Reference Point
☐ Slice
8 Map ID

## Agency and Hydrological

**Geological Classes**

🟪 Principal Aquifer
🟫 Secondary A Aquifer
🟧 Secondary B Aquifer
🟨 Secondary Undifferentiated
⬜ Unproductive Strata
🟩 Unknown

## Site Sensitivity Context Map - Slice A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## Order Details

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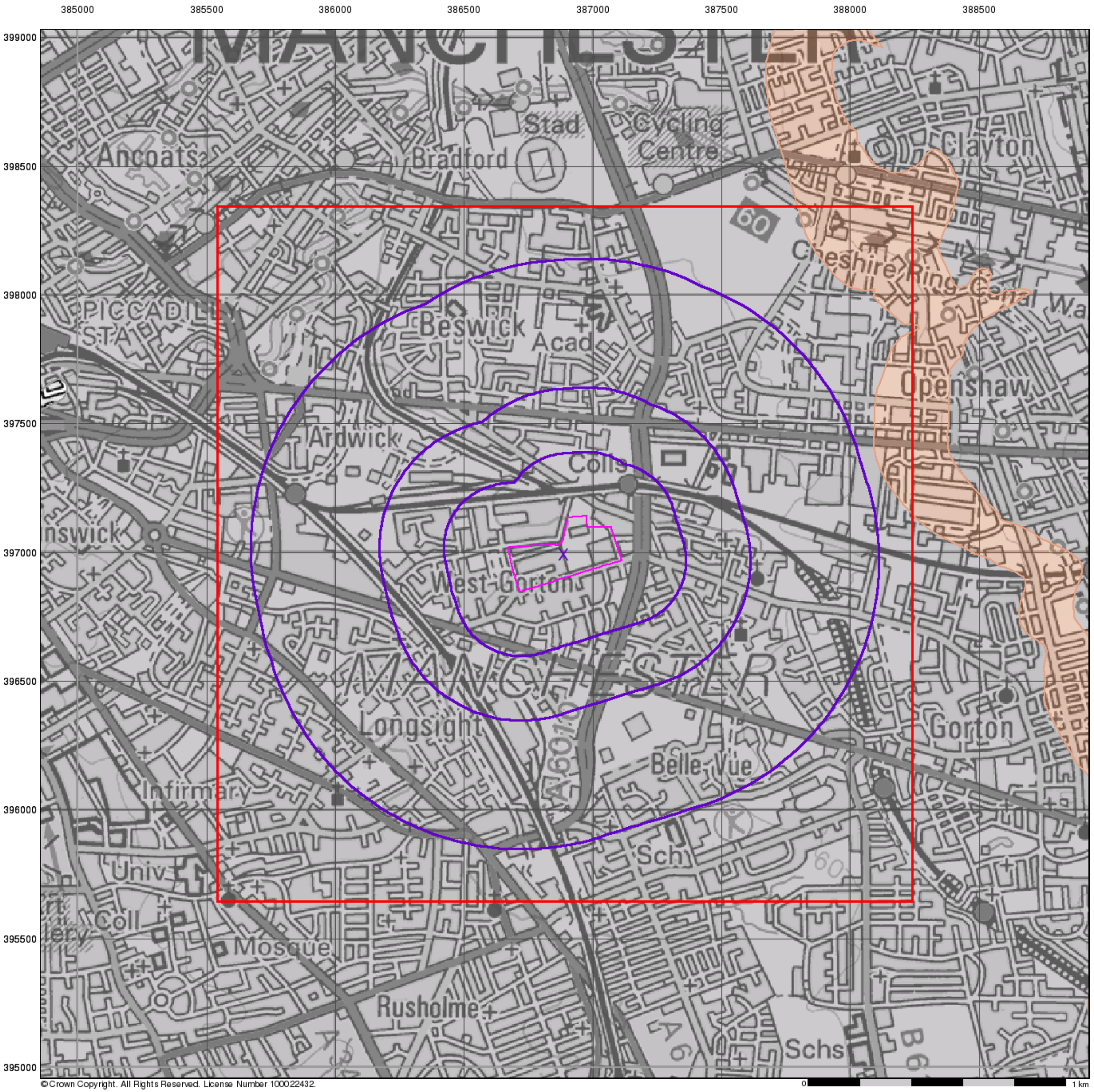
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

Landmark® Information Group

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

## Superficial Aquifer Designation

### General

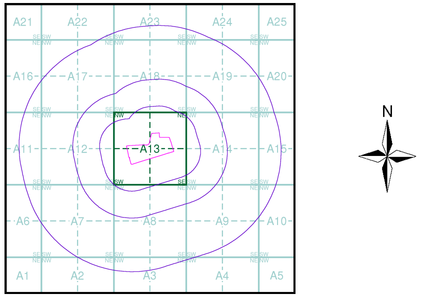
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

### Agency and Hydrological

**Geological Classes**

- 🟪 Principal Aquifer
- 🟧 Secondary A Aquifer
- 🟧 Secondary B Aquifer
- 🟨 Secondary Undifferentiated
- ⬜ Unproductive Strata
- 🟩 Unknown

### Site Sensitivity Context Map - Slice A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### Order Details

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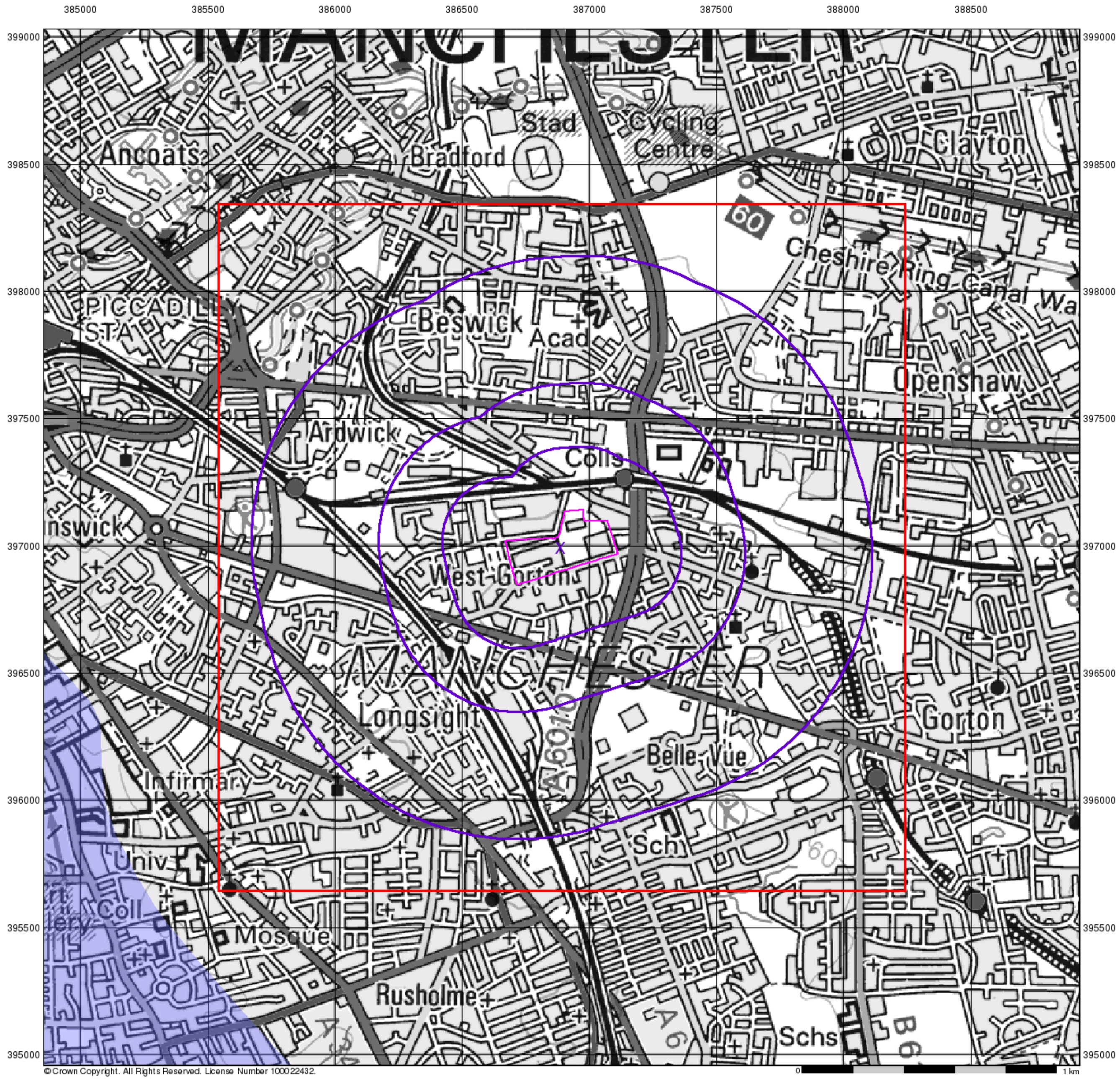
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

### Site Details

Site at 386930, 397100

**Landmark** Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk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Belle Vue
Gorton
Infirmary
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Sch
Rusholme
Schs
60
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# Envirocheck®

## Source Protection Zones

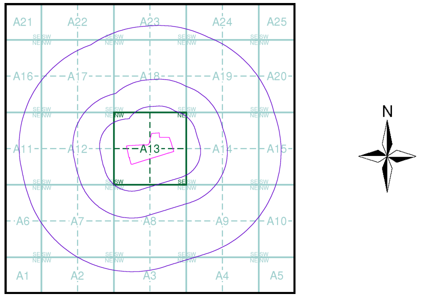
### General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point
- ☐ Slice
- 8 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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### Order Details

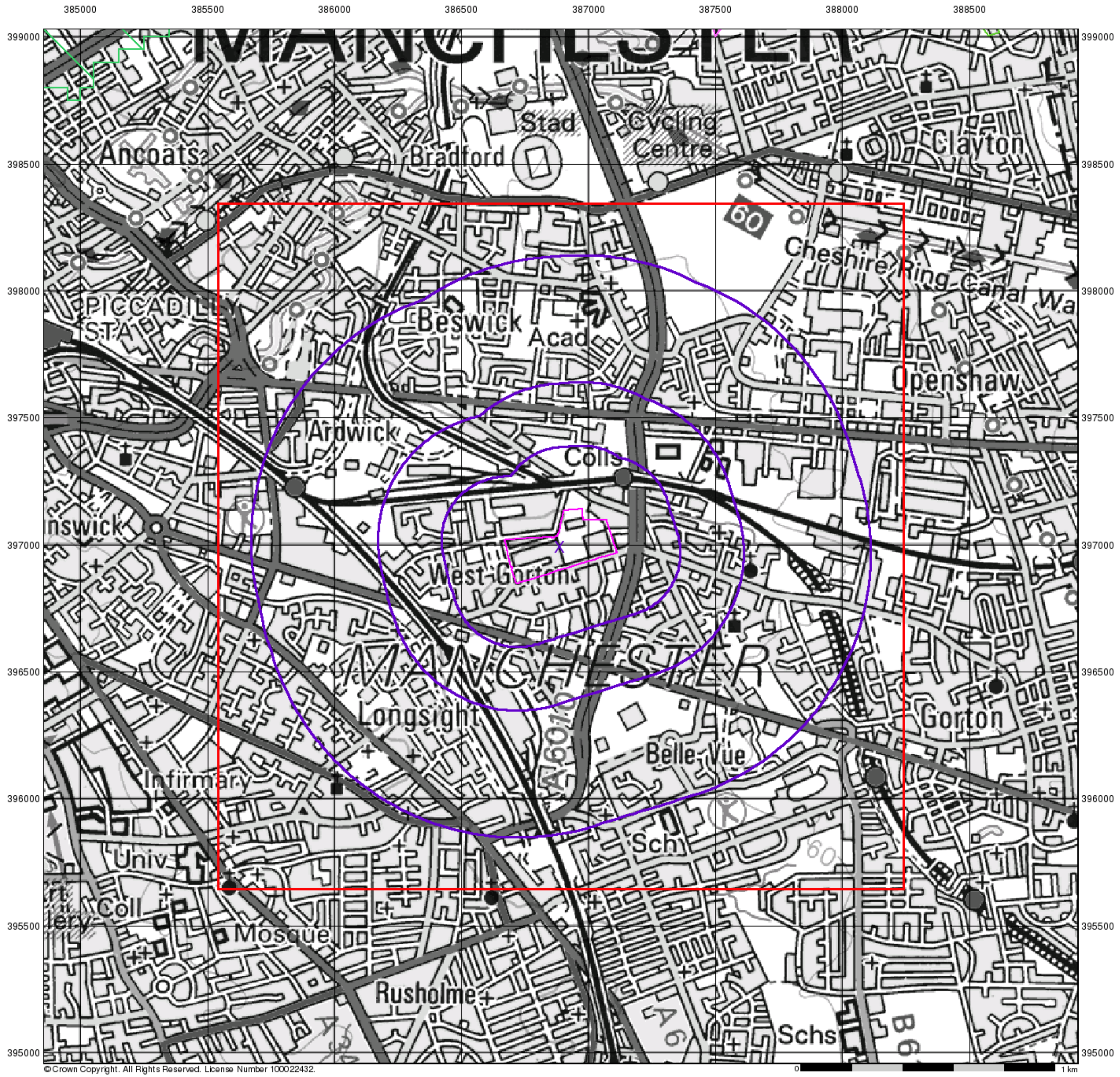
| | |
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

### Site Details

Site at 386930, 397100

Landmark®
Information Group

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

# Sensitive Land Uses

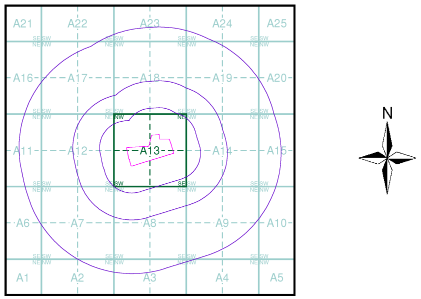
## General

Specified Site
Specified Buffer(s)
X Bearing Reference Point
🟥 Slice
8 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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## Order Details

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|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

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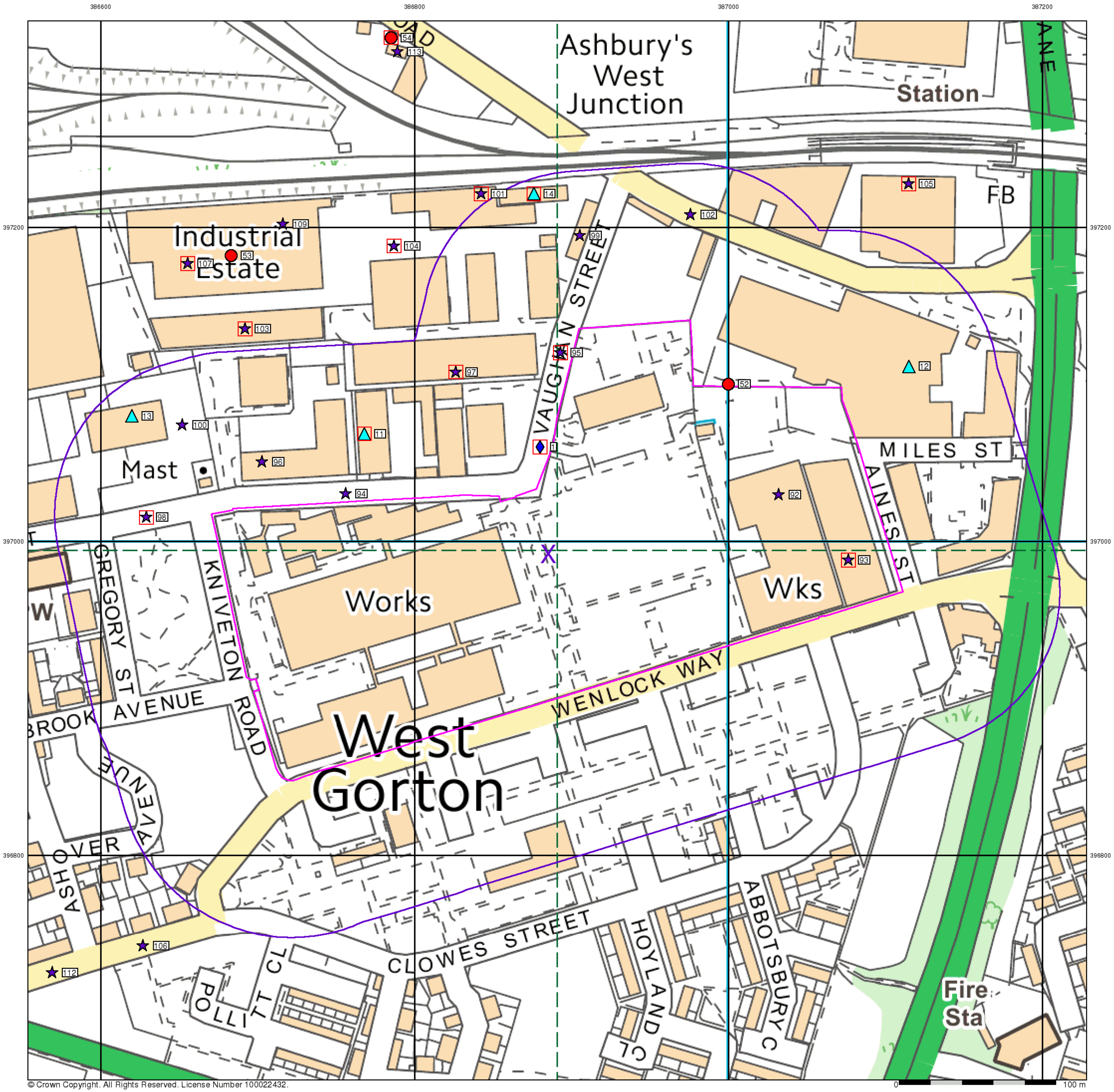
Web: www.envirocheck.co.uk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# Envirocheck®

## General

- ⬡ Specified Site
- ⬡ Specified Buffer(s)
- X Bearing Reference Point
- 8 Map ID
- ☐ Several of Type at Location

## Agency and Hydrological

- ● Contaminated Land Register Entry or Notice (Location)
- ▨ Contaminated Land Register Entry or Notice
- ◆ Discharge Consent
- ▲ Enforcement or Prohibition Notice
- ▲ Integrated Pollution Control
- ■ Integrated Pollution Prevention Control
- ■ Local Authority Integrated Pollution Prevention and Control
- △ Local Authority Pollution Prevention and Control
- ▽ Local Authority Pollution Prevention and Control Enforcement
- ● Pollution Incident to Controlled Waters
- ▼ Prosecution Relating to Authorised Processes
- ◆ Prosecution Relating to Controlled Waters
- ▲ Registered Radioactive Substance
- ∿ River Network or Water Feature
- ✚ River Quality Sampling Point
- ⬟ Substantiated Pollution Incident Register
- ◆ Water Abstraction
- ◆ Water Industry Act Referral

## Geological

- ▼ BGS Recorded Mineral Site

## Industrial Land Use

- ★ Contemporary Trade Directory Entry
- ★ Fuel Station Entry

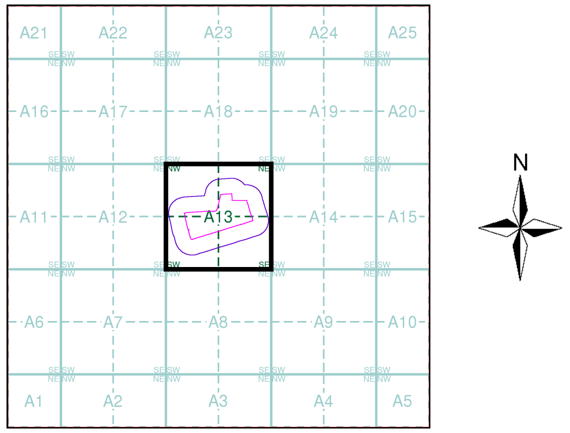
## Waste

- ▼ BGS Recorded Landfill Site (Location)
- ▨ BGS Recorded Landfill Site
- ● EA Historic Landfill (Buffered Point)
- ■ EA Historic Landfill (Polygon)
- ▲ Integrated Pollution Control Registered Waste Site
- ▨ Licensed Waste Management Facility (Landfill Boundary)
- ● Licensed Waste Management Facility (Location)
- ■ Local Authority Recorded Landfill Site (Location)
- ▥ Local Authority Recorded Landfill Site
- ▨ Registered Landfill Site
- ▶ Registered Landfill Site (Location)
- ▤ Registered Landfill Site (Point Buffered to 100m)
- ▤ Registered Landfill Site (Point Buffered to 250m)
- ⬟ Registered Waste Transfer Site (Location)
- ▥ Registered Waste Transfer Site
- ⬟ Registered Waste Treatment or Disposal Site (Location)
- ▤ Registered Waste Treatment or Disposal Site

## Hazardous Substances

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

## Site Sensitivity Map - Segment A13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## Order Details

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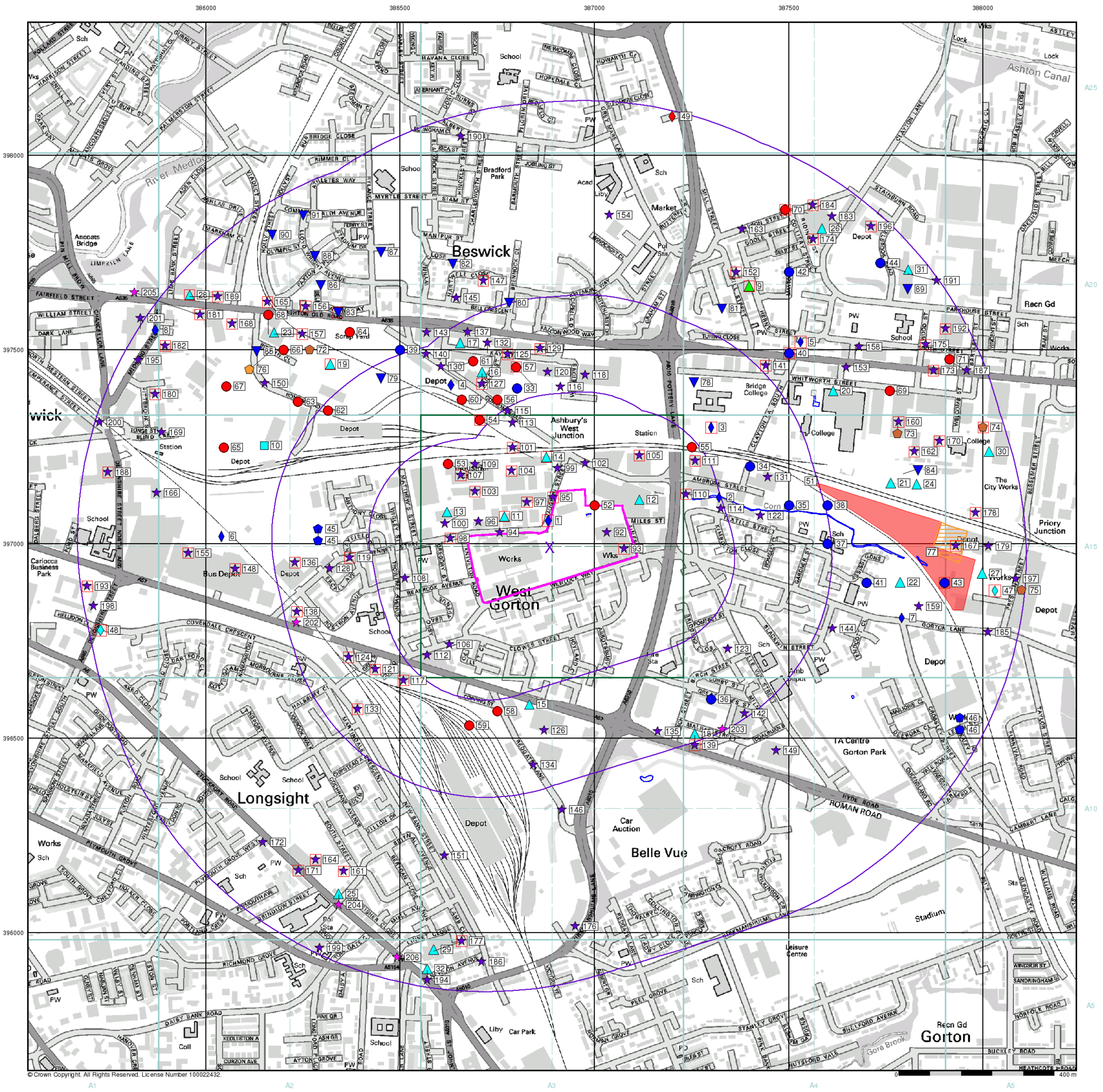
|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |

## Site Details

Site at 386930, 397100

**Landmark®** Information Group

| | |
|---|---|
| Tel: | 0844 844 9952 |
| Fax: | 0844 844 9951 |
| Web: | www.envirocheck.co.uk |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Gorton
Ashton Canal
River Medlock
Ashbury's West Junction
Bradford Park
Ancoats Bridge
Carlocca Business Park
Bus Depot
Car Auction
TA Centre Gorton Park
Leisure Centre
Stadium
The City Works
Priory Junction
Bridge College
Market
Works
Wks
Depot
School
Station
Recn Gd
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# Envirocheck®

## General

- ⬠ Specified Site
- ⬠ Specified Buffer(s)
- X Bearing Reference Point
- ▯ Map ID
- □ Several of Type at Location

## Agency and Hydrological

- ● Contaminated Land Register Entry or Notice (Location)
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- ◆ Discharge Consent
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- ■ Local Authority Integrated Pollution Prevention and Control
- ▲ Local Authority Pollution Prevention and Control
- ▼ Local Authority Pollution Prevention and Control Enforcement
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- ✚ Explosive Site
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- ✖ Planning Hazardous Substance Consent
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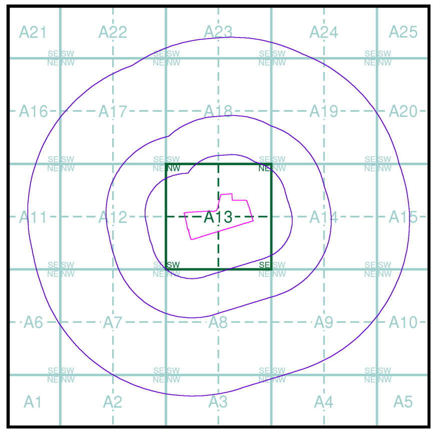
## Site Sensitivity Map - Slice A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## Order Details

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|---|---|
| Order Number: | 72946036_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

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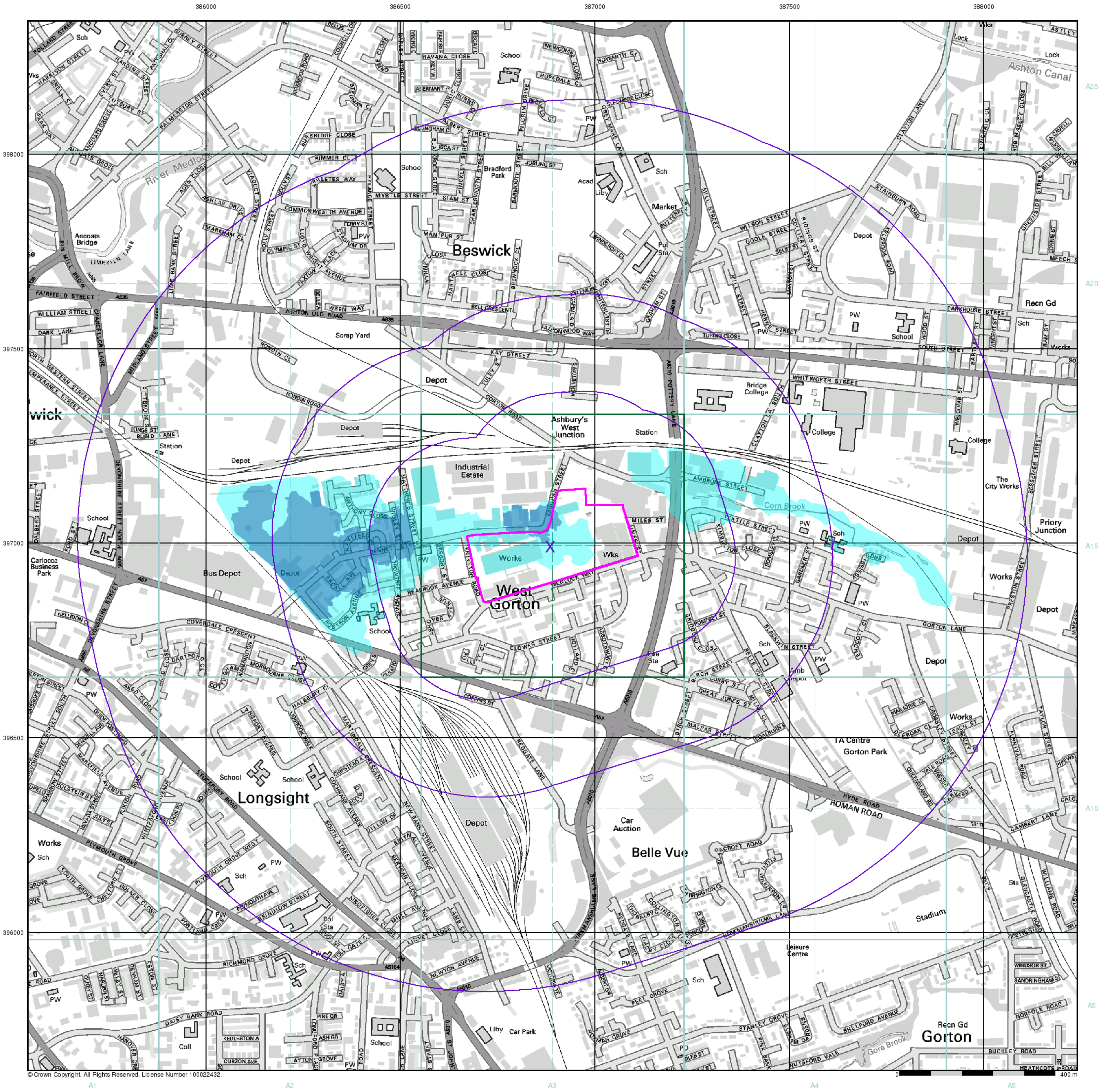
Information Group

| | |
|---|---|
| Tel: | 0844 844 9952 |
| Fax: | 0844 844 9951 |
| Web: | www.envirocheck.co.uk |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River Medlock
Corn Brook
Ashbury's West Junction
Industrial Estate
Works
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Bradford Park
Bridge College
College
Priory Junction
The City Works
Carlocca Business Park
Bus Depot
Car Auction
TA Centre
Gorton Park
Stadium
Leisure Centre
Scrap Yard
Depot
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# Envirocheck®

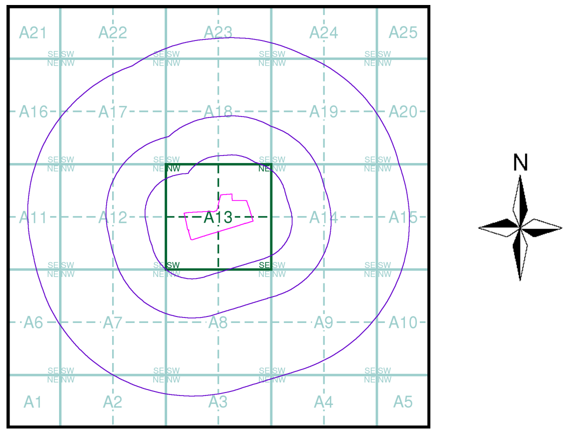
## General

- ⬠ Specified Site
- ⬠ Specified Buffer(s)
- X Bearing Reference Point

## Agency and Hydrological (Flood)

- 🟦 Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- 🟦 Flooding from Rivers or Sea without Defences (Zone 3)
- ▨ Area Benefiting from Flood Defence
- ▨ Flood Water Storage Areas
- - · - Flood Defence

## Flood Map - Slice A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## Site Details

Site at 386930, 397100

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Information Group

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| Fax: | 0844 844 9951 |
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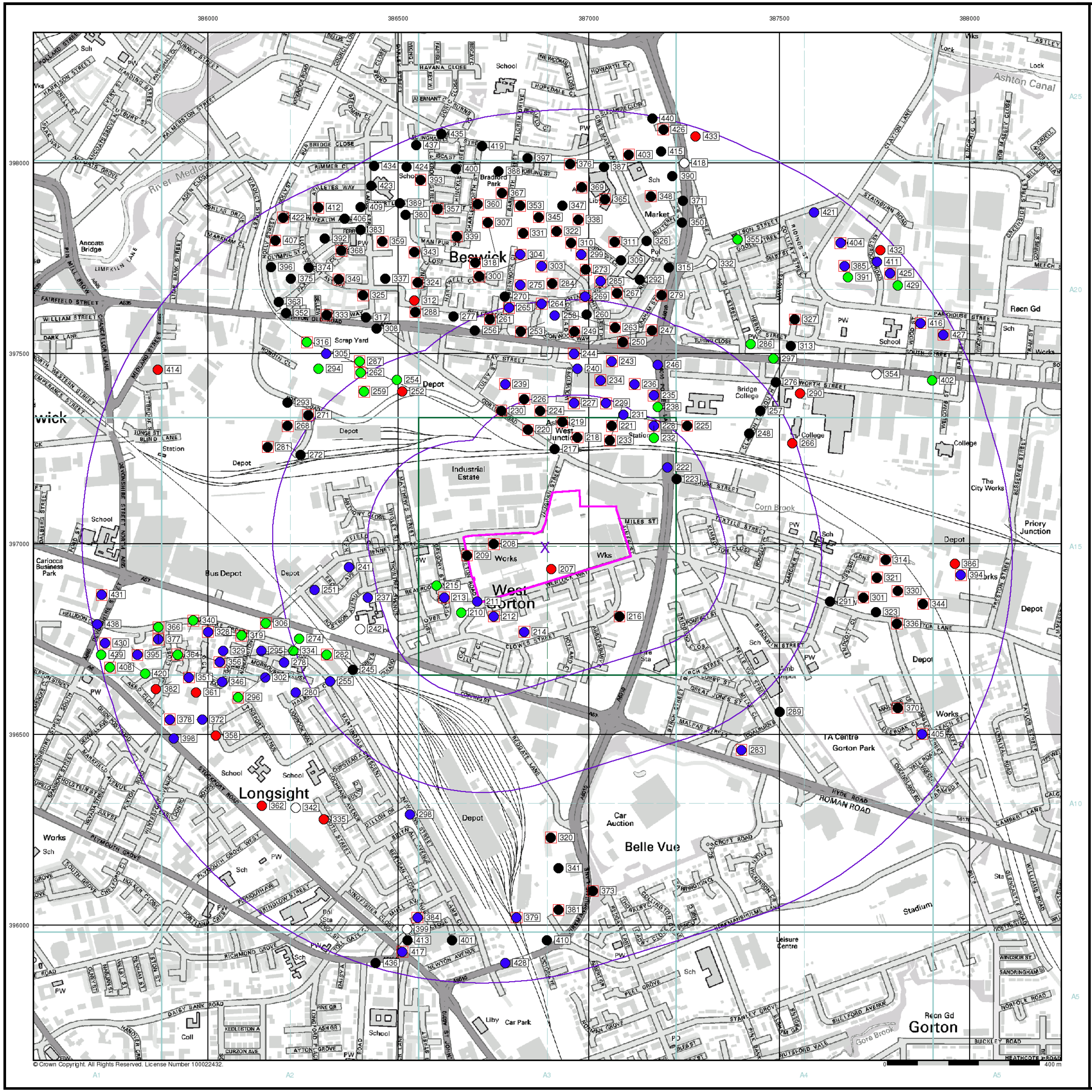
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River Medlock
Ardwick
Bradford Park
Industrial Estate
Bus Depot
Carioca Business Park
Corn Brook
The City Works
Priory Junction
Bridge College
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Stadium
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# Envirocheck®

## General

- ⬠ Specified Site
- ⬠ Specified Buffer(s)
- X Bearing Reference Point
- 8 Map ID
- ☐ Several of Type at Location

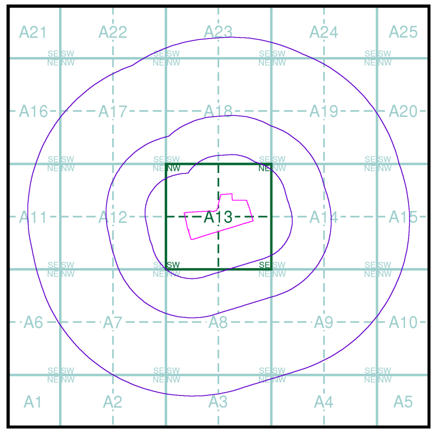
## Agency and Hydrological (Boreholes)

- ● BGS Borehole Depth 0 - 10m
- ● BGS Borehole Depth 10 - 30m
- ● BGS Borehole Depth 30m +
- ● Confidential
- ○ Other

For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

## Borehole Map - Slice A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## Order Details

| | |
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| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

Landmark Information Group

| | |
|---|---|
| Tel: | 0844 844 9952 |
| Fax: | 0844 844 9951 |
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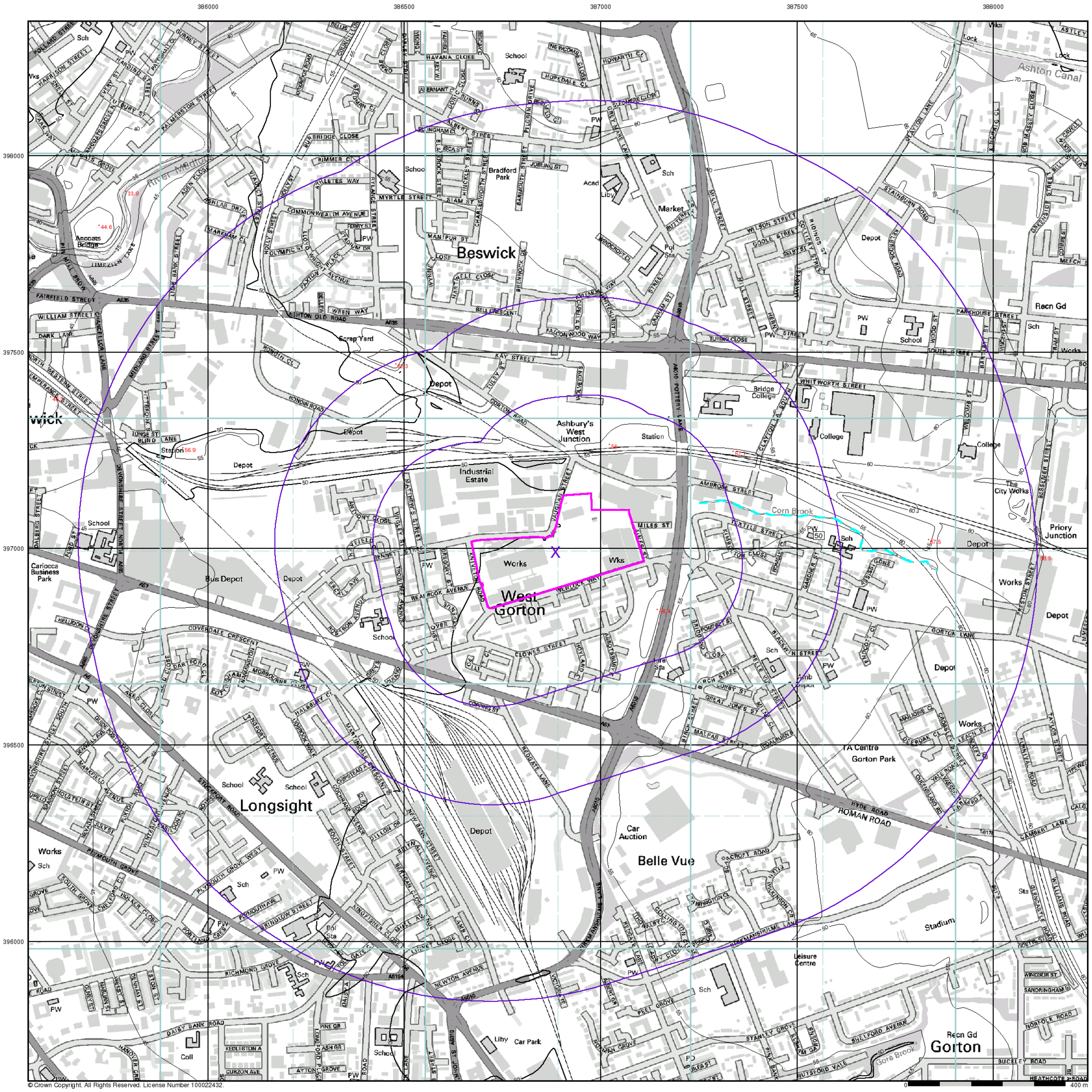
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Ashbury's West Junction
Industrial Estate
Ashton Canal
Corn Brook
Priory Junction
The City Works
Bradford Park
Ancoats Bridge
Carlocca Business Park
Bus Depot
Car Auction
Stadium
Gorton Park
Leisure Centre
Hyde Road
Roman Road
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Gorton Lane
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# Envirocheck®

## General

Specified Site
Specified Buffer(s)
X Bearing Reference Point
8 Map ID

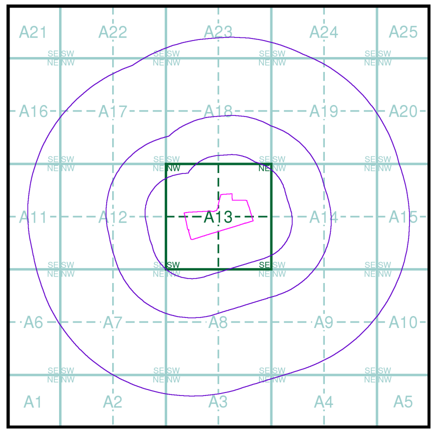
## Detailed River Network Data

| | |
|---|---|
| Primary River | Extended Culvert (greater than 50m) |
| Secondary River | Underground River (inferred) |
| Tertiary River | Underground River (local knowledge) |
| Canal | Downstream of High Water Mark |
| Canal Tunnel | Downstream of Seaward Extension |
| Undefined River | Not assigned River feature |
| Lake/Reservoir | |
| Offline Drainage Feature | |

## Contours (height in metres)

| | | |
|---|---|---|
| Standard Contour | 105 | MLW Mean Low Water |
| Master Contour | 100 95 | MHW Mean High Water |
| Spot Height | 167.3 | |

## EA/NRW Detailed River Network Map - Slice A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## Order Details

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| Order Number: | 72946036_1_1 |
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| National Grid Reference: | 386890, 396990 |
| Slice: | A |
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## Site Details

Site at 386930, 397100

**Landmark**® Information Group

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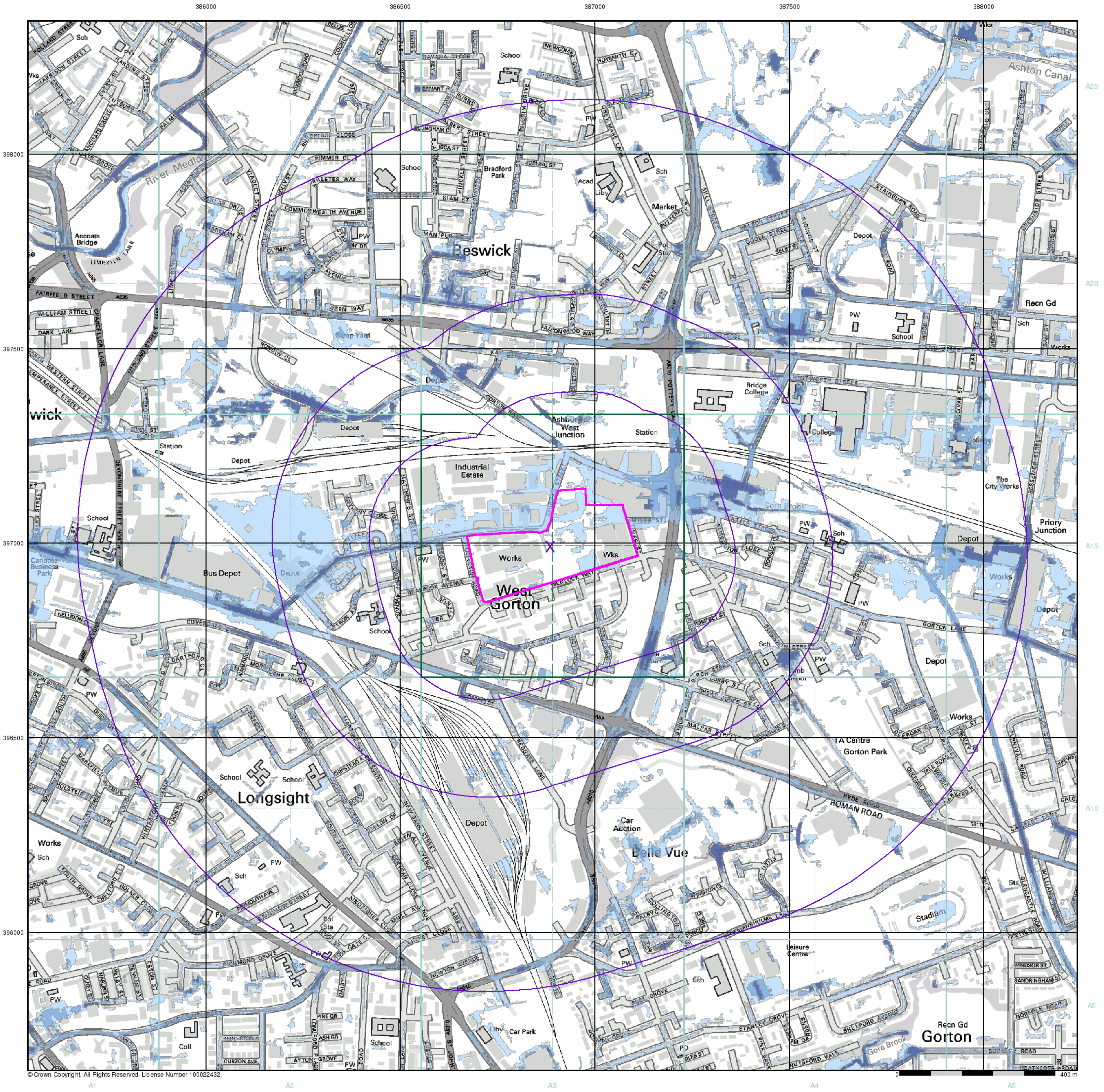
| Fax: | 0844 844 9951 |
| Web: | www.envirocheck.co.uk |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**Envirocheck®**

## General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

## Risk of Flooding from Surface Water

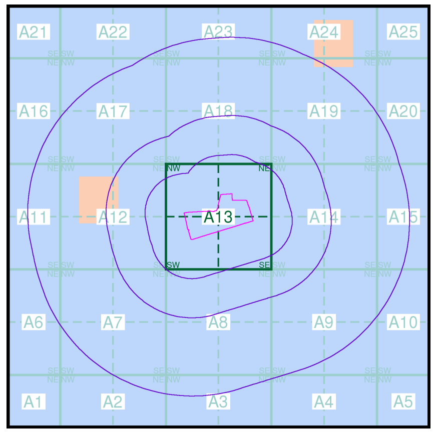
- ■ High - 30 Year Return
- ■ Medium - 100 Year Return
- ■ Low - 1000 Year Return

## Suitability

See the suitability map below

- ■ National to county
- ■ County to town
- ■ Town to street
- ■ Street to parcels of land
- ■ Property

## EA/NRW Suitability Map - Slice A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## Order Details

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## Site Details

Site at 386930, 397100

**Landmark** Information Group

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

# APPENDIX 5

# LANDMARK ENVIRONMENTAL REPORT

# Envirocheck® Report:

# Datasheet

## Order Details:

**Order Number:**
72946036_1_1

**Customer Reference:**
2913

**National Grid Reference:**
386890, 396990

**Slice:**
A

**Site Area (Ha):**
6.84

**Search Buffer (m):**
1000

## Site Details:

Site at 386930, 397100

## Client Details:

MR J Henning
Integra Consulting (Environmental) Ltd
Suite 3
14-32 Hewitt Street
Manchester
M15 4GB

Envirocheck®

# Contents

| Report Section | Page Number |
|---|---|
| Summary | - |
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| Waste | 23 |
| Hazardous Substances | - |
| Geological | 31 |
| Industrial Land Use | 48 |
| Sensitive Land Use | - |
| Data Currency | 74 |
| Data Suppliers | 80 |
| Useful Contacts | 81 |

**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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**Report Version v50.0**

| 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 | | 5 | 3 | 5 |
| Enforcement and Prohibition Notices | | | | | |
| Integrated Pollution Controls | pg 4 | | | | 3 |
| Integrated Pollution Prevention And Control | | | | | |
| Local Authority Integrated Pollution Prevention And Control | pg 4 | | | | 1 |
| Local Authority Pollution Prevention and Controls | pg 4 | | 7 | 4 | 18 |
| Local Authority Pollution Prevention and Control Enforcements | | | | | |
| Nearest Surface Water Feature | pg 8 | Yes | | | |
| Pollution Incidents to Controlled Waters | pg 9 | | | 5 | 9 |
| Prosecutions Relating to Authorised Processes | | | | | |
| Prosecutions Relating to Controlled Waters | | | | | |
| Registered Radioactive Substances | | | | | |
| River Quality | pg 11 | 1 | | | |
| River Quality Biology Sampling Points | | | | | |
| River Quality Chemistry Sampling Points | | | | | |
| Substantiated Pollution Incident Register | pg 11 | | | 1 | 1 |
| Water Abstractions | pg 11 | | | | 6 (*32) |
| Water Industry Act Referrals | pg 21 | | | | 1 |
| Groundwater Vulnerability | pg 21 | Yes | n/a | n/a | n/a |
| Bedrock Aquifer Designations | pg 21 | Yes | n/a | n/a | n/a |
| Superficial Aquifer Designations | pg 21 | Yes | n/a | n/a | n/a |
| Source Protection Zones | | | | | |
| Extreme Flooding from Rivers or Sea without Defences | pg 21 | Yes | Yes | n/a | n/a |
| Flooding from Rivers or Sea without Defences | pg 21 | Yes | Yes | 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 | | | | | n/a |
| Detailed River Network Offline Drainage | pg 22 | | Yes | | n/a |

| 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 | pg 23 | | | 1 | |
| Integrated Pollution Control Registered Waste Sites | | | | | |
| Licensed Waste Management Facilities (Landfill Boundaries) | | | | | |
| Licensed Waste Management Facilities (Locations) | pg 23 | | 5 | 8 | 10 |
| Local Authority Recorded Landfill Sites | | | | | |
| Registered Landfill Sites | | | | | |
| Registered Waste Transfer Sites | pg 28 | | | | 5 |
| Registered Waste Treatment or Disposal Sites | pg 30 | | | | 2 |
| **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 31 | Yes | n/a | n/a | n/a |
| BGS Estimated Soil Chemistry | pg 31 | Yes | Yes | Yes | Yes |
| BGS Recorded Mineral Sites | pg 40 | | | 2 | 13 |
| BGS Urban Soil Chemistry | pg 42 | | Yes | Yes | Yes |
| BGS Urban Soil Chemistry Averages | pg 46 | Yes | | | |
| Brine Compensation Area | | | n/a | n/a | n/a |
| Coal Mining Affected Areas | pg 46 | Yes | n/a | n/a | n/a |
| Mining Instability | pg 46 | Yes | n/a | n/a | n/a |
| Man-Made Mining Cavities | pg 47 | | | | 1 |
| Natural Cavities | | | | | |
| Non Coal Mining Areas of Great Britain | pg 47 | | Yes | n/a | n/a |
| Potential for Collapsible Ground Stability Hazards | pg 47 | Yes | | n/a | n/a |
| Potential for Compressible Ground Stability Hazards | pg 47 | | Yes | n/a | n/a |
| Potential for Ground Dissolution Stability Hazards | pg 47 | Yes | | n/a | n/a |
| Potential for Landslide Ground Stability Hazards | pg 47 | Yes | | n/a | n/a |
| Potential for Running Sand Ground Stability Hazards | pg 47 | Yes | | n/a | n/a |
| Potential for Shrinking or Swelling Clay Ground Stability Hazards | pg 47 | Yes | | n/a | n/a |
| Radon Potential - Radon Affected Areas | pg 47 | Yes | n/a | n/a | n/a |
| Radon Potential - Radon Protection Measures | | | n/a | n/a | n/a |

| 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 48 | 3 | 45 | 73 | 161 |
| Fuel Station Entries | pg 73 | | | 2 | 3 |
| **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 Plc (?)<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: Vaughan St/Bennet St, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Irwell<br>Reference: 016993693<br>Permit Version: 1<br>Effective Date: 13th September 2005<br>Issued Date: 13th September 2005<br>Revocation Date: Not Supplied<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge Environment: Freshwater Stream/River<br>Receiving Water: Corn Brook<br>**Status:** **Consent Currently Under Appeal**<br>Positional Accuracy: Located by supplier to within 10m | A13NW<br>(N) | 4 | 3 | 386880<br>397050 |
| 1 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: Vaughan St/Bennet St, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Irwell<br>Reference: 01MAN0218<br>Permit Version: 1<br>Effective Date: 1st January 1995<br>Issued Date: 1st January 1995<br>Revocation Date: 12th September 2005<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge Environment: Freshwater Stream/River<br>Receiving Water: Corn Brook<br>**Status:** **Consent revoked or revised: New Consent issued (Section 37(1))**<br>Positional Accuracy: Located by supplier to within 100m | A13NW<br>(N) | 7 | 3 | 386880<br>397060 |
| 1 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: Vaughan St/Bennet St, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Supplied<br>Reference: 016982957<br>Permit Version: 2<br>Effective Date: 21st January 2014<br>Issued Date: 29th March 2010<br>Revocation Date: Not Supplied<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge Environment: Freshwater Stream/River<br>Receiving Water: Corn Brook<br>**Status:** **Modified (Water Resources Act 1991, Schedule 10 as amended by Environment Act 1995)**<br>Positional Accuracy: Located by supplier to within 10m | A13NW<br>(N) | 8 | 3 | 386876<br>397049 |
| 1 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: Vaughan St/Bennet St, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 016982957<br>Permit Version: 1<br>Effective Date: 23rd June 1995<br>Issued Date: Not Supplied<br>Revocation Date: 20th January 2014<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge Environment: Freshwater Stream/River<br>Receiving Water: Corn Brook<br>**Status:** **Post National Rivers Authority Legislation where issue date > 31/08/1989**<br>Positional Accuracy: Located by supplier to within 10m | A13NW<br>(N) | 14 | 3 | 386870<br>397050 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 2 | **Discharge Consents**<br>Operator: United Utilities Water Plc (?)<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: Eccleshall Street Cso, Eccleshall Street, Openshaw, Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Supplied<br>Reference: 016982734<br>Permit Version: 2<br>Effective Date: 2nd August 2005<br>Issued Date: 2nd August 2005<br>Revocation Date: Not Supplied<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge Environment: Freshwater Stream/River<br>Receiving Water: Corn Brook<br>**Status:** **Varied by Application - (Water Resources Act 1991, Schedule 10 as amended by Environment Act 1995)**<br>Positional Accuracy: Located by supplier to within 10m | A14NW<br>(E) | 245 | 3 | 387320<br>397120 |
| 3 | **Discharge Consents**<br>Operator: Rolls Royce Ltd<br>Property Type: Other Mach & Mech Equipment<br>Location: Pottery Lane, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Upper Mersey<br>Reference: 016992566<br>Permit Version: 1<br>Effective Date: 3rd August 1993<br>Issued Date: Not Supplied<br>Revocation Date: 3rd October 1994<br>Discharge Type: Trade Discharges - Cooling Water<br>Discharge Environment: Freshwater Stream/River<br>Receiving Water: Corn Brook<br>**Status:** **Authorisation revokedRevoked**<br>Positional Accuracy: Manually corrected supplier location | A14NW<br>(NE) | 305 | 3 | 387300<br>397300 |
| 3 | **Discharge Consents**<br>Operator: Rolls Royce Ltd<br>Property Type: Other Mach & Mech Equipment<br>Location: Pottery Lane, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Supplied<br>Reference: 016992566<br>Permit Version: 2<br>Effective Date: 4th October 1994<br>Issued Date: Not Supplied<br>Revocation Date: 31st March 1996<br>Discharge Type: Trade Discharges - Cooling Water<br>Discharge Environment: Freshwater Stream/River<br>Receiving Water: Corn Brook<br>**Status:** **Lapsed (under Environment Act 1995, Schedule 23)**<br>Positional Accuracy: Located by supplier to within 100m | A14NW<br>(NE) | 305 | 3 | 387300<br>397300 |
| 4 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: Gorton Rd/Tuley St, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Supplied<br>Reference: 01man0199<br>Permit Version: 2<br>Effective Date: 21st January 2014<br>Issued Date: 29th March 2010<br>Revocation Date: Not Supplied<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge Environment: Freshwater Stream/River<br>Receiving Water: Black Brook<br>**Status:** **Modified (Water Resources Act 1991, Schedule 10 as amended by Environment Act 1995)**<br>Positional Accuracy: Located by supplier to within 10m | A18SW<br>(NW) | 387 | 3 | 386631<br>397409 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 5 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: George Street/Clayton Lane, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 01MAN0374<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:** **Surrendered under EPR 2010**<br>Positional Accuracy: Located by supplier to within 100m | A19SW<br>(NE) | 623 | 3 | 387530<br>397520 |
| 5 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: South St/Nr Clayton Lane, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 01MAN0375<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:** **Post National Rivers Authority Legislation where issue date > 31/08/1989**<br>Positional Accuracy: Located by supplier to within 100m | A19SW<br>(NE) | 637 | 3 | 387540<br>397530 |
| 6 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: Gorton Rd/Tuley St, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 01MAN0199<br>Permit Version: 1<br>Effective Date: 1st January 1995<br>Issued Date: Not Supplied<br>Revocation Date: 20th January 2014<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge Environment: Freshwater Stream/River<br>Receiving Water: Black Brook<br>**Status:** **Post National Rivers Authority Legislation where issue date > 31/08/1989**<br>Positional Accuracy: Located by supplier to within 100m | A12NW<br>(W) | 631 | 3 | 386040<br>397020 |
| 7 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Pumping Station - Water Company<br>Location: Gorton Ln/Crossley St, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 01man0214<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: Corn Brook<br>**Status:** **Authorisation revokedRevoked**<br>Positional Accuracy: Located by supplier to within 100m | A14SE<br>(E) | 698 | 3 | 387790<br>396810 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 8 | **Discharge Consents**<br>Operator: United Utilities Water Limited<br>Property Type: Sewerage Network - Sewers - Water Company<br>Location: Berry St/Buxworth St, Manchester, Greater Manchester<br>Authority: Environment Agency, North West Region<br>Catchment Area: Not Given<br>Reference: 01MAN0255<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: Freshwater Stream/River<br>Receiving Water: River Medlock<br>**Status: Post National Rivers Authority Legislation where issue date > 31/08/1989**<br>Positional Accuracy: Located by supplier to within 100m | A16SE<br>(NW) | 962 | 3 | 385870<br>397550 |
| 9 | **Integrated Pollution Controls**<br>Name: Ciba Specialty Chemicals Plc<br>Location: PO Box 2, CLAYTON, Openshaw, MANCHESTER, Lancashire, M11 4AP<br>Authority: Environment Agency, North West Region<br>Permit Reference: By0577<br>Dated: 25th June 2004<br>Process Type: IPC minor (non-substantial) variation to previous variation<br>Description: 4.2 A (A) Manufacture and use of Organic Chemicals within the Chemical Industry<br>**Status: Authorisation revokedRevoked**<br>Positional Accuracy: Automatically positioned to the address | A19SW<br>(NE) | 649 | 3 | 387398<br>397659 |
| 9 | **Integrated Pollution Controls**<br>Name: Ciba Specialty Chemicals Plc<br>Location: PO Box 2, CLAYTON, Openshaw, MANCHESTER, Lancashire, M11 4AP<br>Authority: Environment Agency, North West Region<br>Permit Reference: Bt9046<br>Dated: 12th February 2003<br>Process Type: IPC minor (non-substantial) variation to previous variation<br>Description: 4.2 A (A) Manufacture and use of Organic Chemicals within the Chemical Industry<br>**Status: Authorisation superseded by a substantial or non substantial variationSuperseded**<br>Positional Accuracy: Automatically positioned to the address | A19SW<br>(NE) | 649 | 3 | 387398<br>397659 |
| 9 | **Integrated Pollution Controls**<br>Name: Ciba Specialty Chemicals Plc<br>Location: PO Box 2, CLAYTON, Openshaw, MANCHESTER, Lancashire, M11 4AP<br>Authority: Environment Agency, North West Region<br>Permit Reference: AO5042<br>Dated: 3rd October 1994<br>Process Type: IPC minor (non-substantial) variation to previous variation<br>Description: 4.2 A (A) Manufacture and use of Organic Chemicals within the Chemical Industry<br>**Status: Authorisation superseded by a substantial or non substantial variationSuperseded**<br>Positional Accuracy: Automatically positioned to the address | A19SW<br>(NE) | 649 | 3 | 387398<br>397659 |
| 10 | **Local Authority Integrated Pollution Prevention And Control**<br>Name: W Howarth Metals Ltd<br>Location: 22 Rondin Road, Ardwick, Manchester, M12 6bf<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: LA-IPPC/01/10/RM<br>Dated: 22nd October 2010<br>Process Type: Production and Processing of Metals<br>Description: SG4<br>**Status: Permit Issued**<br>Positional Accuracy: Located by supplier to within 10m | A12NW<br>(W) | 572 | 4 | 386150<br>397253 |
| 11 | **Local Authority Pollution Prevention and Controls**<br>Name: Forrest & Sym Ltd<br>Location: 155 Bennett Street, Ardwick, Manchester, M12 5ab<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/75/95/96<br>Dated: 31st December 1992<br>Process Type: Local Authority Air Pollution Control<br>Description: PG2/4 Iron, steel and non-ferrous metal foundry processes<br>**Status: Authorisation revokedRevoked**<br>Positional Accuracy: Located by supplier to within 10m | A13NW<br>(NW) | 42 | 4 | 386768<br>397067 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 11 | **Local Authority Pollution Prevention and Controls**<br>Name: Forrest & Sym Ltd<br>Location: 155 Bennett Street, Ardwick, Manchester, M12 5ab<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/75/95/96<br>Dated: 31st December 1992<br>Process Type: Local Authority Air Pollution Control<br>Description: PG2/5 Hot and cold blast cupolas<br>**Status:** **Authorisation revokedRevoked**<br>Positional Accuracy: Located by supplier to within 10m | A13NW<br>(NW) | 42 | 4 | 386768<br>397067 |
| 11 | **Local Authority Pollution Prevention and Controls**<br>Name: Kingspan Hotwater Systems Ltd (Manchester Coppersmiths)<br>Location: Garland Works, Bennett Street, MANCHESTER, M12 5BW<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/B/18/05/AW<br>Dated: 5th December 2000<br>Process Type: Local Authority Air Pollution Control<br>Description: PG6/29 Di-isocyanate processes<br>**Status:** **Authorised**<br>Positional Accuracy: Located by supplier to within 10m | A13NW<br>(NW) | 59 | 4 | 386763<br>397084 |
| 12 | **Local Authority Pollution Prevention and Controls**<br>Name: Long & Crawford Ltd<br>Location: Gorton Road, West Gorton, MANCHESTER, Greater Manchester, M12 5DA<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/43/93<br>Dated: 1st March 1996<br>Process Type: Local Authority Air Pollution Control<br>Description: PG6/23 Coating of metal and plastic<br>**Status:** **Authorisation revokedRevoked**<br>Positional Accuracy: Located by supplier to within 10m | A13NE<br>(NE) | 45 | 4 | 387115<br>397110 |
| 13 | **Local Authority Pollution Prevention and Controls**<br>Name: Approved Hydraulics<br>Location: The Brook Business Complex, Bennett Street, MANCHESTER, Lancashire, M12 5AU<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/B/15/05/AW<br>Dated: 3rd September 1996<br>Process Type: Local Authority Air Pollution Control<br>Description: PG1/1Waste oil burners, less than 0.4MW net rated thermal input<br>**Status:** **Authorisation revokedRevoked**<br>Positional Accuracy: Automatically positioned to the address | A13NW<br>(W) | 80 | 4 | 386620<br>397078 |
| 14 | **Local Authority Pollution Prevention and Controls**<br>Name: Cvr Commercials Ltd<br>Location: Unit 2 Vaughan Industrial Estate, Vaughan Street, West Gorton, M12 5du<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/B/05/10/RM<br>Dated: 18th August 2010<br>Process Type: Local Authority Pollution Prevention and Control<br>Description: PG6/34 Respraying of road vehicles<br>**Status:** **Permitted**<br>Positional Accuracy: Located by supplier to within 10m | A13NW<br>(N) | 83 | 4 | 386863<br>397207 |
| 14 | **Local Authority Pollution Prevention and Controls**<br>Name: Sprayrite Commercials Manchester<br>Location: Unit 1 Vaughan Industrial Estate, Vaughan Street, W Gorton, Manchester, M12 5du<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/B/31/05/AW<br>Dated: 1st June 1996<br>Process Type: Local Authority Air Pollution Control<br>Description: PG6/34 Respraying of road vehicles<br>**Status:** **Authorisation revokedRevoked**<br>Positional Accuracy: Manually positioned to the address or location | A13NW<br>(N) | 90 | 4 | 386876<br>397220 |
| 15 | **Local Authority Pollution Prevention and Controls**<br>Name: Hartwell Manchester<br>Location: Hyde Road, Belle Vue, Gorton, Manchester, Greater Manchester, M12 4sa<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC72/95<br>Dated: 12th January 1996<br>Process Type: Local Authority Air Pollution Control<br>Description: PG6/34 Respraying of road vehicles<br>**Status:** **Authorisation revokedRevoked**<br>Positional Accuracy: Located by supplier to within 10m | A8NW<br>(S) | 286 | 4 | 386832<br>396583 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 16 | **Local Authority Pollution Prevention and Controls**<br>Name: Corbett Robertson & Co<br>Location: 14-18 Tuley Street, MANCHESTER, Lancashire, M11 2DY<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: 79/95<br>Dated: 6th November 1995<br>Process Type: Local Authority Air Pollution Control<br>Description: PG6/34 Respraying of road vehicles<br>**Status: Authorisation revokedRevoked**<br>Positional Accuracy: Manually positioned to the address or location | A18SW<br>(N) | 360 | 4 | 386710<br>397438 |
| 17 | **Local Authority Pollution Prevention and Controls**<br>Name: Innovative Output Solutions Ltd (K2)<br>Location: 21 Kay Street, Openshaw, MANCHESTER, M11 2DX<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/B/19/05/AW<br>Dated: 19th December 2000<br>Process Type: Local Authority Air Pollution Control<br>Description: PG6/16 Printworks<br>**Status: Authorisation revokedRevoked**<br>Positional Accuracy: Manually positioned to the address or location | A18SW<br>(NW) | 454 | 4 | 386654<br>397513 |
| 18 | **Local Authority Pollution Prevention and Controls**<br>Name: Belle Vue Filling Station<br>Location: 545 Hyde Road, Belle Vue, Gorton, MANCHESTER, Lancashire, M18 5NQ<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/PFS/RM/009/06<br>Dated: 23rd December 1998<br>Process Type: Local Authority Air Pollution Control<br>Description: PG1/14 Petrol filling station<br>**Status: Authorised**<br>Positional Accuracy: Manually positioned to the address or location | A9NW<br>(SE) | 483 | 4 | 387258<br>396508 |
| 19 | **Local Authority Pollution Prevention and Controls**<br>Name: P Mcguiness And Co Ltd<br>Location: Rondin Close, Ardwick<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/B/07/05/AW<br>Dated: 27th May 1993<br>Process Type: Local Authority Pollution Prevention and Control<br>Description: PG3/8 Quarry processes including roadstone plants and the size reduction of bricks, tiles and concrete<br>**Status: Authorisation revokedRevoked**<br>Positional Accuracy: Located by supplier to within 10m | A17SE<br>(NW) | 548 | 4 | 386340<br>397454 |
| 19 | **Local Authority Pollution Prevention and Controls**<br>Name: P Mcguinness & Co Ltd<br>Location: Rondin House, Rondin Road, Ardwick, Manchester, Lancashire, M12 6bf<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: 75/92<br>Dated: 7th May 1992<br>Process Type: Local Authority Air Pollution Control<br>Description: PG3/8 Quarry processes including roadstone plants and the size reduction of bricks, tiles and concrete<br>**Status: Authorised**<br>Positional Accuracy: Located by supplier to within 10m | A17SE<br>(NW) | 564 | 4 | 386320<br>397459 |
| 20 | **Local Authority Pollution Prevention and Controls**<br>Name: Mancat - Openshaw Campus<br>Location: Whitworth Street, Openshaw, MANCHESTER, Lancashire, M11 2WH<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: 80/95<br>Dated: 20th November 1995<br>Process Type: Local Authority Air Pollution Control<br>Description: PG6/34 Respraying of road vehicles<br>**Status: Authorisation revokedRevoked**<br>Positional Accuracy: Manually positioned to the address or location | A19SE<br>(NE) | 616 | 4 | 387614<br>397390 |
| 21 | **Local Authority Pollution Prevention and Controls**<br>Name: Lafarge Aggregates Ltd<br>Location: Ashburys Railway Sidings, Off Bessemer Street, Gorton, Manchester, Lancashire, M11 2<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/B/05/05/AW<br>Dated: 28th January 2000<br>Process Type: Local Authority Air Pollution Control<br>Description: PG3/15 Mineral drying and roadstone coating processes<br>**Status: Authorised**<br>Positional Accuracy: Located by supplier to within 10m | A14NE<br>(E) | 677 | 4 | 387762<br>397153 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 22 | **Local Authority Pollution Prevention and Controls**<br>Name: Sanderson FordManchester Garages Ltd<br>Location: Gorton Lane, Gorton, Manchester, Lancashire, M18 8bt<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/93/97<br>Dated: 27th January 1997<br>Process Type: Local Authority Air Pollution Control<br>Description: PG6/34 Respraying of road vehicles<br>**Status: Authorisation revokedRevoked**<br>Positional Accuracy: Located by supplier to within 10m | A14SE<br>(E) | 679 | 4 | 387786<br>396897 |
| 23 | **Local Authority Pollution Prevention and Controls**<br>Name: Dc Cook Manchester Ltd<br>Location: 1 Rondin Close, MANCHESTER, Lancashire, M12 6LL<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: 83/96<br>Dated: 1st February 1996<br>Process Type: Local Authority Air Pollution Control<br>Description: PG6/34 Respraying of road vehicles<br>**Status: Authorisation revokedRevoked**<br>Positional Accuracy: Manually positioned to the address or location | A17SW<br>(NW) | 721 | 4 | 386175<br>397541 |
| 24 | **Local Authority Pollution Prevention and Controls**<br>Name: Lafarge Aggregates Ltd<br>Location: Ashbury Sidings, Bessemer Street, Gorton, MANCHESTER, M11<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/B/05/05/AW<br>Dated: 19th October 2001<br>Process Type: Local Authority Air Pollution Control<br>Description: PG3/1Blending, packing, loading and use of bulk cement<br>**Status: Authorised**<br>Positional Accuracy: Manually positioned to the address or location | A14NE<br>(E) | 734 | 4 | 387823<br>397146 |
| 25 | **Local Authority Pollution Prevention and Controls**<br>Name: Mercury Filling Station<br>Location: 353 Stockport Road, Longsight, MANCHESTER, M13 0LF<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/PFS/RM/012/06<br>Dated: 20th December 2001<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 | A7SE<br>(SW) | 842 | 4 | 386341<br>396096 |
| 26 | **Local Authority Pollution Prevention and Controls**<br>Name: Rotunda Plc<br>Location: Clayton Lane, Clayton, Manchester, M11 4sr<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/60/63<br>Dated: 14th June 1994<br>Process Type: Local Authority Air Pollution Control<br>Description: PG6/28 Rubber processes<br>**Status: Authorisation revokedRevoked**<br>Positional Accuracy: Located by supplier to within 10m | A19NE<br>(NE) | 876 | 4 | 387585<br>397808 |
| 27 | **Local Authority Pollution Prevention and Controls**<br>Name: Cemex Operations<br>Location: Preston Street, Gorton, MANCHESTER, Greater Manchester, M18 8DB<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/B/17/05/AW<br>Dated: 3rd October 1996<br>Process Type: Local Authority Air Pollution Control<br>Description: PG3/1Blending, packing, loading and use of bulk cement<br>**Status: Authorised**<br>Positional Accuracy: Manually positioned to the address or location | A15SW<br>(E) | 888 | 4 | 387997<br>396920 |
| 28 | **Local Authority Pollution Prevention and Controls**<br>Name: Ardwick Service Station<br>Location: 38 Ashton Old Road, Ardwick, MANCHESTER, M12 6LP<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: Not Given<br>Dated: 28th February 2000<br>Process Type: Local Authority Air Pollution Control<br>Description: PG1/14 Petrol filling station<br>**Status: Authorisation revokedRevoked**<br>Positional Accuracy: Automatically positioned to the address | A17SW<br>(NW) | 903 | 4 | 385975<br>397593 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 28 | **Local Authority Pollution Prevention and Controls**<br>Name: Ardwick Service Station<br>Location: 38 Ashton Old Road, Ardwick, MANCHESTER, Lancashire, M12 6LP<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: Pfs/1/00<br>Dated: 28th February 2000<br>Process Type: Local Authority Air Pollution Control<br>Description: PG1/14 Petrol filling station<br>**Status:** **Authorisation revokedRevoked**<br>Positional Accuracy: Automatically positioned to the address | A17SW<br>(NW) | 903 | 4 | 385975<br>397593 |
| 28 | **Local Authority Pollution Prevention and Controls**<br>Name: Mercedez-Benz Retail Used Cars<br>Location: 83 Ashton Road, Beswick, MANCHESTER, Lancashire, M12 6BL<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/B/42/06/RM<br>Dated: 1st July 1997<br>Process Type: Local Authority Air Pollution Control<br>Description: PG6/34 Respraying of road vehicles<br>**Status:** **Authorised**<br>Positional Accuracy: Manually positioned to the address or location | A17SW<br>(NW) | 945 | 4 | 385958<br>397637 |
| 28 | **Local Authority Pollution Prevention and Controls**<br>Name: Bristol Street Manchester Ltd<br>Location: 83 Ashton Old Road, Beswick, Manchester, M12 6bl<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PFS/95/97/00<br>Dated: 19th June 1997<br>Process Type: Local Authority Air Pollution Control<br>Description: PG6/34 Respraying of road vehicles<br>**Status:** **Authorisation revokedRevoked**<br>Positional Accuracy: Located by supplier to within 10m | A17SW<br>(NW) | 986 | 4 | 385921<br>397657 |
| 29 | **Local Authority Pollution Prevention and Controls**<br>Name: Gb Auto'S<br>Location: Unit 10/11 Longsight Industrial Estate, Newton Avenue, Manchester, M12 4ey<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/B/04/10/RM<br>Dated: 10th August 2010<br>Process Type: Local Authority Pollution Prevention and Control<br>Description: PG1/1Waste oil burners, less than 0.4MW net rated thermal input<br>**Status:** **Permitted**<br>Positional Accuracy: Manually positioned to the address or location | A3NW<br>(S) | 906 | 4 | 386586<br>395952 |
| 30 | **Local Authority Pollution Prevention and Controls**<br>Name: Manchester City Council Direct Works Department<br>Location: Bessemer Street, Manchester, Lancashire, M11 2nw<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/16/92<br>Dated: 26th May 1992<br>Process Type: Local Authority Pollution Prevention and Control<br>Description: PG6/2 Manufacture of timber and wood-based products<br>**Status:** **Authorisation revokedRevoked**<br>Positional Accuracy: Located by supplier to within 10m | A15NW<br>(E) | 943 | 4 | 388015<br>397234 |
| 31 | **Local Authority Pollution Prevention and Controls**<br>Name: Cascade Ltd<br>Location: 3 Kelbrook Road, Parkhouse Industrial Estate, Openshaw, M11 2dd<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/B/01/09/RM<br>Dated: 23rd March 2009<br>Process Type: Local Authority Pollution Prevention and Control<br>Description: PG6/23 Coating of metal and plastic<br>**Status:** **Permitted**<br>Positional Accuracy: Located by supplier to within 10m | A19NE<br>(NE) | 952 | 4 | 387807<br>397702 |
| 32 | **Local Authority Pollution Prevention and Controls**<br>Name: Bismi Petroleum<br>Location: 441 Stockport Road, Longsight, MANCHESTER, Lancashire, M12 4JB<br>Authority: Manchester City Council, Environmental Health Department<br>Permit Reference: PPC/PFS/RM/026/06<br>Dated: 18th June 1999<br>Process Type: Local Authority Air Pollution Control<br>Description: PG1/14 Petrol filling station<br>**Status:** **Permitted**<br>Positional Accuracy: Manually positioned to the address or location | A3NW<br>(S) | 957 | 4 | 386569<br>395903 |
|  | **Nearest Surface Water Feature** | A13NE<br>(NE) | 0 | - | 386979<br>397073 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 33 | **Pollution Incidents to Controlled Waters**<br>Property Type: Restaurant/Hotels/Pubs<br>Location: Yummie 36 Take Away, Wellington Street, GREAT HARWOOD<br>Authority: Environment Agency, North West Region<br>Pollutant: Miscellaneous - Fire water / Foam<br>Note: Corn Brook; Fire Water Run Off<br>Incident Date: 22nd July 1997<br>Incident Reference: 97651326<br>Catchment Area: Manchester Ship Canal<br>Receiving Water: Freshwater Stream/River<br>Cause of Incident: Fire<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A18SW<br>(N) | 285 | 3 | 386800<br>397400 |
| 34 | **Pollution Incidents to Controlled Waters**<br>Property Type: Pollution Found Source Not Determined<br>Location: Location Description Not Available<br>Authority: Environment Agency, North West Region<br>Pollutant: Organic Wastes: Unknown<br>Note: Corn Brook<br>Incident Date: 4th December 1995<br>Incident Reference: 95652915<br>Catchment Area: Manchester Ship Canal<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 | A14NW<br>(E) | 344 | 3 | 387400<br>397200 |
| 35 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Greater Manchester<br>Authority: Environment Agency, North West Region<br>Pollutant: Oils - Unknown<br>Note: Corn Brook; Oil<br>Incident Date: 22nd March 1996<br>Incident Reference: 96650536<br>Catchment Area: Manchester Ship Canal<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 | A14NW<br>(E) | 411 | 3 | 387500<br>397100 |
| 36 | **Pollution Incidents to Controlled Waters**<br>Property Type: Spillage; Accident - Static Site<br>Location: Location Description Not Available<br>Authority: Environment Agency, North West Region<br>Pollutant: Miscellaneous - Unknown<br>Note: Corn Brook<br>Incident Date: 27th October 1992<br>Incident Reference: 92641899<br>Catchment Area: Manchester Ship Canal<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 | A9NW<br>(SE) | 414 | 3 | 387300<br>396600 |
| 37 | **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: Industrial Effluent<br>Note: Corn Brook; Drum Washings<br>Incident Date: 11th February 1993<br>Incident Reference: 93640213<br>Catchment Area: Manchester Ship Canal<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 | A14NE<br>(E) | 491 | 3 | 387600<br>397000 |
| 38 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Greater Manchester<br>Authority: Environment Agency, North West Region<br>Pollutant: Oils - Unknown<br>Note: Corn Brook; Oil<br>Incident Date: 22nd March 1996<br>Incident Reference: 96650530<br>Catchment Area: Manchester Ship Canal<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 | A14NE<br>(E) | 507 | 3 | 387600<br>397100 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 39 | **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: Crude Sewage<br>Note: River Goyt<br>Incident Date: 16th March 1995<br>Incident Reference: 95640540<br>Catchment Area: Goyt<br>Receiving Water: Not Given<br>Cause of Incident: Blocked Sewer<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A17SE<br>(NW) | 512 | 3 | 386500<br>397500 |
| 40 | **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 Pollution Found<br>Incident Date: 29th April 1996<br>Incident Reference: 96631133<br>Catchment Area: Medlock<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 | A19SW<br>(NE) | 584 | 3 | 387500<br>397495 |
| 40 | **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: Chemicals To Drains<br>Incident Date: 9th April 1996<br>Incident Reference: 96630695<br>Catchment Area: Medlock<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 | A19SW<br>(NE) | 588 | 3 | 387500<br>397500 |
| 41 | **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: Corn Brook; None Pollution Found<br>Incident Date: 10th May 1995<br>Incident Reference: 95651082<br>Catchment Area: Manchester Ship Canal<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<br>(E) | 593 | 3 | 387700<br>396900 |
| 42 | **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: No Watercourse Affluence<br>Incident Date: 11th November 1994<br>Incident Reference: 94652477<br>Catchment Area: Manchester Ship Canal<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 | A19NW<br>(NE) | 739 | 3 | 387500<br>397700 |
| 43 | **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: Chemicals - Other Organic<br>Note: Corn Brook; Latex<br>Incident Date: 9th August 1994<br>Incident Reference: 94651819<br>Catchment Area: Manchester Ship Canal<br>Receiving Water: Not Given<br>Cause of Incident: Blocked Sewer<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A14SE<br>(E) | 792 | 3 | 387900<br>396900 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 43 | **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: Other Chemicals<br>Note: Corn Brook; Latex<br>Incident Date: 21st April 1995<br>Incident Reference: 95650878<br>Catchment Area: Manchester Ship Canal<br>Receiving Water: Not Given<br>Cause of Incident: Accidental Spillage/Leakage<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A14SE<br>(E) | 793 | 3 | 387900<br>396895 |
| 44 | **Pollution Incidents to Controlled Waters**<br>Property Type: Pollution Found Source Not Determined<br>Location: Location Description Not Available<br>Authority: Environment Agency, North West Region<br>Pollutant: Crude Sewage<br>Note: Clayton Brook<br>Incident Date: 28th June 1994<br>Incident Reference: 94651414<br>Catchment Area: Manchester Ship Canal<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 | A19NE<br>(NE) | 945 | 3 | 387800<br>397700 |
| | **River Quality**<br>Name: Corn Bk<br>GQA Grade: River Quality C<br>Reach: Qsl At Openshaw To Msc<br>Estimated Distance (km): 5.6<br>Flow Rate: Flow less than 0.31 cumecs<br>Flow Type: River<br>Year: 2000 | A13SW<br>(S) | 0 | 3 | 386838<br>396817 |
| 45 | **Substantiated Pollution Incident Register**<br>Authority: Environment Agency - North West Region, South Area<br>Incident Date: 11th February 2011<br>Incident Reference: 857784<br>Water Impact: Category 4 - No Impact<br>Air Impact: Category 4 - No Impact<br>Land Impact: Category 2 - Significant Incident<br>Positional Accuracy: Located by supplier to within 10m<br>Pollutant: General Biodegradable : Other<br>Pollutant: Inert : Construction / Demolition Material<br>Pollutant: Asbestos Waste | A12NE<br>(W) | 383 | 3 | 386289<br>397039 |
| 46 | **Substantiated Pollution Incident Register**<br>Authority: Environment Agency - North West Region, South Area<br>Incident Date: 18th November 2008<br>Incident Reference: 639771<br>Water Impact: Category 4 - No Impact<br>Air Impact: Category 4 - No Impact<br>Land Impact: Category 2 - Significant Incident<br>Positional Accuracy: Located by supplier to within 10m<br>Pollutant: Specific Waste Materials: Vehicles And Vehicle Parts | A10NW<br>(SE) | 928 | 3 | 387940<br>396552 |
| 47 | **Water Abstractions**<br>Operator: Cemex Uk Materials Limited<br>Licence Number: Nw/069/0004/012<br>Permit Version: 1<br>Location: Borehole At Preston Street, Manchester<br>Authority: Environment Agency, North West Region<br>Abstraction: Mineral Products: Process Water<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: 19th June 2014<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A15SW<br>(E) | 924 | 3 | 388030<br>396880 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 47 | **Water Abstractions**<br>Operator: Cemex Uk Materials Ltd<br>Licence Number: 2569006044<br>Permit Version: 3<br>Location: Borehole At Preston Street, Gorton, Manchester<br>Authority: Environment Agency, North West Region<br>Abstraction: Mineral Products: Process Water<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: Borehole At Preston Street, Gorton, Manchester<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 15th October 2007<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A15SW<br>(E) | 924 | 3 | 388030<br>396880 |
| 47 | **Water Abstractions**<br>Operator: Cemex Uk Materials Ltd<br>Licence Number: 2569006044<br>Permit Version: 2<br>Location: Borehole At Preston Street, Gorton, Manchester<br>Authority: Environment Agency, North West Region<br>Abstraction: Mineral Products: Process Water<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: Borehole At Preston Street, Gorton, Manchester<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 22nd March 2004<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A15SW<br>(E) | 924 | 3 | 388030<br>396880 |
| 47 | **Water Abstractions**<br>Operator: Rmc Readymix Ltd<br>Licence Number: 2569006044<br>Permit Version: 1<br>Location: Borehole At Preston Street, Gorton, Manchester<br>Authority: Environment Agency, North West Region<br>Abstraction: Mineral Products: Process Water<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: Borehole At Preston Street, Gorton, Manchester<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 23rd October 2003<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A15SW<br>(E) | 924 | 3 | 388030<br>396880 |
| 48 | **Water Abstractions**<br>Operator: G T Energy Uk Limited<br>Licence Number: Nw/069/0004/005<br>Permit Version: 2<br>Location: Area Of Abstraction - Lower Carboniferous Limestone<br>Authority: Environment Agency, North West Region<br>Abstraction: Other Industrial/Commercial/Public Services: Heat Pump<br>Abstraction Type: Water may be abstracted from any point within an area<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Devonshire Street, Manchester<br>Authorised Start: 01 April<br>Authorised End: 31 March<br>Permit Start Date: 11th June 2013<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A11SE<br>(W) | 971 | 3 | 385729<br>396778 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 48 | **Water Abstractions**<br>Operator: Gt Energy Limited<br>Licence Number: Nw/069/0004/005<br>Permit Version: 1<br>Location: Area Of Abstraction - Lower Carboniferous Limestone<br>Authority: Environment Agency, North West Region<br>Abstraction: Other Industrial/Commercial/Public Services: Heat Pump<br>Abstraction Type: Water may be abstracted from any point within an area<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: 17th January 2013<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A11SE<br>(W) | 971 | 3 | 385729<br>396778 |
|  | **Water Abstractions**<br>Operator: Manchester City Council<br>Licence Number: 2569006006<br>Permit Version: Not Supplied<br>Location: Borehole, Openshaw, MANCHESTER<br>Authority: Environment Agency, North West Region<br>Abstraction: Manufacturing<br>Abstraction Type: Not Supplied<br>Source: Groundwater<br>Daily Rate (m3): 2273<br>Yearly Rate (m3): 2273<br>Details: Licence Status: Revoked<br>Authorised Start: Not Supplied<br>Authorised End: Not Supplied<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | A19NE<br>(NE) | 1012 | 3 | 387800<br>397800 |
|  | **Water Abstractions**<br>Operator: Manchester City Football Club Limited<br>Licence Number: Nw/069/0006/005<br>Permit Version: 1<br>Location: Borehole At Openshaw, West Ashton<br>Authority: Environment Agency, North West Region<br>Abstraction: Sports Grounds/Facilities: Horticultural Watering<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: 14th November 2012<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A24SE<br>(NE) | 1115 | 3 | 387681<br>398032 |
|  | **Water Abstractions**<br>Operator: Manchester City Football Club Limited<br>Licence Number: Nw/069/0006/005<br>Permit Version: 1<br>Location: Borehole At Openshaw, West Ashton<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: Not Supplied<br>Authorised Start: 01 April<br>Authorised End: 31 March<br>Permit Start Date: 14th November 2012<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A24SE<br>(NE) | 1115 | 3 | 387681<br>398032 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Water Abstractions**<br>Operator: Manchester City Football Club Limited<br>Licence Number: Nw/069/0006/005<br>Permit Version: 1<br>Location: Borehole At Openshaw, West Ashton<br>Authority: Environment Agency, North West Region<br>Abstraction: Private Water Undertaking: 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: 14th November 2012<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A24SE<br>(NE) | 1115 | 3 | 387681<br>398032 |
| | **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 | A4NE<br>(SE) | 1179 | 3 | 387591<br>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 | A4NE<br>(SE) | 1179 | 3 | 387591<br>395891 |
| | **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 | A4NE<br>(SE) | 1180 | 3 | 387590<br>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 | A4NE<br>(SE) | 1180 | 3 | 387590<br>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 | A4NE<br>(SE) | 1180 | 3 | 387590<br>395890 |
| | **Water Abstractions**<br>Operator: Ciba Specialty Chemicals Plc<br>Licence Number: 2569006026<br>Permit Version: 101<br>Location: Borehole At Premises, Clayton, Manchester<br>Authority: Environment Agency, North West Region<br>Abstraction: Chemicals: General Cooling (Existing Licences Only) (Low Loss)<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): 2837<br>Yearly Rate (m3): 633949<br>Details: Premises At Clayton Manchester<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 25th July 2000<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | A24SE<br>(NE) | 1183 | 3 | 387700<br>398100 |
| | **Water Abstractions**<br>Operator: Ciba Specialty Chemicals Plc<br>Licence Number: 2569006026<br>Permit Version: 101<br>Location: Borehole At Premises, Clayton, Manchester<br>Authority: Environment Agency, North West Region<br>Abstraction: Chemicals: Process Water<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: Premises At Clayton Manchester<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 25th July 2000<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A24SE<br>(NE) | 1183 | 3 | 387700<br>398100 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
|  | **Water Abstractions**<br>Operator: G R A Limited<br>Licence Number: 2569006043<br>Permit Version: 2<br>Location: Permo-Triassic Sandstone At Belle Vue, Manchester<br>Authority: Environment Agency, North West Region<br>Abstraction: Sports Grounds/Facilities: Dust suppression<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: Belle Vue Greyhound Stadium, Gorton<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 1st April 2008<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A10SW<br>(SE) | 1207 | 3 | 387950<br>396100 |
|  | **Water Abstractions**<br>Operator: Wembley Plc<br>Licence Number: 2569006043<br>Permit Version: 1<br>Location: Permo-Triassic Sandstone At Belle Vue, Manchester<br>Authority: Environment Agency, North West Region<br>Abstraction: Sports Grounds/Facilities: Dust suppression<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: Belle Vue Greyhound Stadium, Gorton<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 20th June 2003<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A10SW<br>(SE) | 1207 | 3 | 387950<br>396100 |
|  | **Water Abstractions**<br>Operator: British Waterways<br>Licence Number: 2569006996<br>Permit Version: 100<br>Location: Ashton Canal, Manchester [Vitacom]<br>Authority: Environment Agency, North West Region<br>Abstraction: Other Industrial/Commercial/Public Services: General Cooling (Existing Licences Only) (Low Loss)<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Surface<br>Daily Rate (m3): 0<br>Yearly Rate (m3): 227300<br>Details: (British Vita Ltd)<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 1st April 1969<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | A24NE<br>(NE) | 1401 | 3 | 387600<br>398395 |
|  | **Water Abstractions**<br>Operator: British Waterways Board<br>Licence Number: 2569006030<br>Permit Version: Not Supplied<br>Location: Manchester, MANCHESTER<br>Authority: Environment Agency, North West Region<br>Abstraction: Not Supplied<br>Abstraction Type: Not Supplied<br>Source: Canal<br>Daily Rate (m3): 0<br>Yearly Rate (m3): 0<br>Details: Ashton Canal<br>Authorised Start: Not Supplied<br>Authorised End: Not Supplied<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | A24NE<br>(NE) | 1405 | 3 | 387600<br>398400 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Water Abstractions**<br>Operator: Air Products Chemicals Ltd<br>Licence Number: 2569006036<br>Permit Version: 100<br>Location: Borehole On Premises At Clayton Manchester<br>Authority: Environment Agency, North West Region<br>Abstraction: Chemicals: General Cooling (Existing Licences Only) (Low Loss)<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): 3600<br>Yearly Rate (m3): 372772<br>Details: Premises At Clayton, Manchester<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 1st July 1996<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | A25SW<br>(NE) | 1441 | 3 | 388000<br>398200 |
| | **Water Abstractions**<br>Operator: Air Products Chemicals Ltd<br>Licence Number: 2569006036<br>Permit Version: 100<br>Location: Borehole On Premises At Clayton Manchester<br>Authority: Environment Agency, North West Region<br>Abstraction: Chemicals: Process Water<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: Premises At Clayton, Manchester<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 1st July 1996<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A25SW<br>(NE) | 1441 | 3 | 388000<br>398200 |
| | **Water Abstractions**<br>Operator: Canal And River Trust<br>Licence Number: 2569006997<br>Permit Version: 100<br>Location: Ashton Canal Manchester Clayton Analine<br>Authority: Environment Agency, North West Region<br>Abstraction: Other Industrial/Commercial/Public Services: Process Water<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Surface<br>Daily Rate (m3): 0<br>Yearly Rate (m3): 3500420<br>Details: Land At Ciba<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 1st April 1969<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | A24NE<br>(NE) | 1488 | 3 | 387800<br>398395 |
| | **Water Abstractions**<br>Operator: British Waterways Board<br>Licence Number: 2569006030<br>Permit Version: Not Supplied<br>Location: Manchester, MANCHESTER<br>Authority: Environment Agency, North West Region<br>Abstraction: Not Supplied<br>Abstraction Type: Not Supplied<br>Source: Canal<br>Daily Rate (m3): 0<br>Yearly Rate (m3): 0<br>Details: Ashton Canal<br>Authorised Start: Not Supplied<br>Authorised End: Not Supplied<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | A24NE<br>(NE) | 1492 | 3 | 387800<br>398400 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Water Abstractions**<br>Operator: Air Products (Chemicals) Plc<br>Licence Number: 2569006037<br>Permit Version: 101<br>Location: Borehole 2 On Premises At Croft Street, Clayton, Manchester<br>Authority: Environment Agency, North West Region<br>Abstraction: Chemicals: Non-Evaporative Cooling<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: Premises At Croft Street, Clayton, Manchester<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 10th September 2007<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A24NE<br>(NE) | 1500 | 3 | 387859<br>398375 |
| | **Water Abstractions**<br>Operator: Air Products (Chemicals) Plc<br>Licence Number: 2569006037<br>Permit Version: 101<br>Location: Borehole 1 On Premises At Croft Street, Clayton, Manchester<br>Authority: Environment Agency, North West Region<br>Abstraction: Chemicals: Non-Evaporative Cooling<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: Premises At Croft Street, Clayton, Manchester<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 10th September 2007<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A24NE<br>(NE) | 1504 | 3 | 387860<br>398379 |
| | **Water Abstractions**<br>Operator: Air Products (Chemicals) Plc<br>Licence Number: 2569006036<br>Permit Version: 101<br>Location: Borehole On Premises At Clayton, Manchester<br>Authority: Environment Agency, North West Region<br>Abstraction: Chemicals: Non-Evaporative Cooling<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: Premises At Clayton, Manchester<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 10th September 2007<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A25SW<br>(NE) | 1518 | 3 | 388027<br>398277 |
| | **Water Abstractions**<br>Operator: Moseley Rubber Co Ltd<br>Licence Number: 2569006001<br>Permit Version: 100<br>Location: Borehole At Premises, Broadie St, Ardwick, Manchester<br>Authority: Environment Agency, North West Region<br>Abstraction: Rubber: General Cooling (Existing Licences Only) (Low Loss)<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): 909<br>Yearly Rate (m3): 331858<br>Details: Premises At Broadie St., Ardwick<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 8th February 1966<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A16SW<br>(W) | 1523 | 3 | 385240<br>397540 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Water Abstractions**<br>Operator: Victor Wolf Ltd<br>Licence Number: 2569007020<br>Permit Version: Not Supplied<br>Location: Two Boreholes, Croft Street, Clayton, MANCHESTER<br>Authority: Environment Agency, North West Region<br>Abstraction: Cooling<br>Abstraction Type: Not Supplied<br>Source: Groundwater<br>Daily Rate (m3): 2182<br>Yearly Rate (m3): 372772<br>Details: Licence Status: Revoked<br>Authorised Start: Not Supplied<br>Authorised End: Not Supplied<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | A24NE<br>(NE) | 1539 | 3 | 387900<br>398395 |
| | **Water Abstractions**<br>Operator: Air Products Chemicals Ltd<br>Licence Number: 2569006037<br>Permit Version: 100<br>Location: Boreholes X 2 On Premises At Croft Street Clayton Manchester<br>Authority: Environment Agency, North West Region<br>Abstraction: Chemicals: General Cooling (Existing Licences Only) (Low Loss)<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): 655<br>Yearly Rate (m3): 111832<br>Details: Premises Croft St, Clayton, M/Cr<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 1st July 1996<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | A24NE<br>(NE) | 1543 | 3 | 387900<br>398400 |
| | **Water Abstractions**<br>Operator: Canal And River Trust<br>Licence Number: 2569006995<br>Permit Version: 100<br>Location: Ashton Canal, Manchester<br>Authority: Environment Agency, North West Region<br>Abstraction: Other Industrial/Commercial/Public Services: General Cooling (Existing Licences Only) (Low Loss)<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Surface<br>Daily Rate (m3): 0<br>Yearly Rate (m3): 68190<br>Details: Land At Air Products<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 1st April 1969<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | A25SW<br>(NE) | 1578 | 3 | 388100<br>398295 |
| | **Water Abstractions**<br>Operator: British Waterways Board<br>Licence Number: 2569006030<br>Permit Version: Not Supplied<br>Location: Manchester, MANCHESTER<br>Authority: Environment Agency, North West Region<br>Abstraction: Not Supplied<br>Abstraction Type: Not Supplied<br>Source: Canal<br>Daily Rate (m3): 0<br>Yearly Rate (m3): 0<br>Details: Ashton Canal<br>Authorised Start: Not Supplied<br>Authorised End: Not Supplied<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | A25SW<br>(NE) | 1582 | 3 | 388100<br>398300 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Water Abstractions**<br>Operator: British Waterways Board<br>Licence Number: 2569006992<br>Permit Version: Not Supplied<br>Location: Ashton Canal, MANCHESTER<br>Authority: Environment Agency, North West Region<br>Abstraction: Drinking; Cooking; Sanitary; Washing For Industrial Premises<br>Abstraction Type: Not Supplied<br>Source: Canal<br>Daily Rate (m3): 0<br>Yearly Rate (m3): 1136500<br>Details: Licence Status: Revoked<br>Authorised Start: Not Supplied<br>Authorised End: Not Supplied<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | (N) | 1656 | 3 | 386900<br>398795 |
| | **Water Abstractions**<br>Operator: British Waterways Board<br>Licence Number: 2569006030<br>Permit Version: Not Supplied<br>Location: Location Description Not Available<br>Authority: Environment Agency, North West Region<br>Abstraction: Not Supplied<br>Abstraction Type: Not Supplied<br>Source: Canal<br>Daily Rate (m3): 0<br>Yearly Rate (m3): 0<br>Details: Ashton Canal<br>Authorised Start: Not Supplied<br>Authorised End: Not Supplied<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | (N) | 1661 | 3 | 386900<br>398800 |
| | **Water Abstractions**<br>Operator: British Waterways<br>Licence Number: 2569006990<br>Permit Version: 100<br>Location: Ashton Canal, Manchester [Distillers, Ancoats]<br>Authority: Environment Agency, North West Region<br>Abstraction: Other Industrial/Commercial/Public Services: General Cooling (Existing Licences Only) (Low Loss)<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Surface<br>Daily Rate (m3): 0<br>Yearly Rate (m3): 750090<br>Details: (Lancashire Tar Distillers<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 1st April 1969<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | (NW) | 1938 | 3 | 385900<br>398795 |
| | **Water Abstractions**<br>Operator: British Waterways Board<br>Licence Number: 2569006030<br>Permit Version: Not Supplied<br>Location: Manchester, MANCHESTER<br>Authority: Environment Agency, North West Region<br>Abstraction: Not Supplied<br>Abstraction Type: Not Supplied<br>Source: Canal<br>Daily Rate (m3): 0<br>Yearly Rate (m3): 0<br>Details: Ashton Canal<br>Authorised Start: Not Supplied<br>Authorised End: Not Supplied<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | (NW) | 1943 | 3 | 385900<br>398800 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Water Abstractions**<br>Operator: V H E Construction Limited<br>Licence Number: 2569006040<br>Permit Version: Not Supplied<br>Location: The River, Medlock, MANCHESTER<br>Authority: Environment Agency, North West Region<br>Abstraction: Dust Suppression<br>Abstraction Type: Not Supplied<br>Source: Surface<br>Daily Rate (m3): 20<br>Yearly Rate (m3): 2000<br>Details: Licence Status: Lapsed<br>Authorised Start: Not Supplied<br>Authorised End: Not Supplied<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | (N) | 1967 | 3 | 386800<br>399100 |
| 49 | **Water Industry Act Referrals**<br>Name: Clifford Whatmough Ltd (Dissolved)<br>Location: CLIFFORD WHATMOUGH LTD (DISSOLVED), SCORE STREET, SCORE STREET, MANCHESTER, MANCHESTER, M11 2BW<br>Authority: Environment Agency, North West Region<br>Permit Reference: AW4917<br>Dated: 19th August 1996<br>Process Type: Permissions or amendments to discharge under the Water Industry Act 1991<br>Description: Processes which result in the discharge of Special Category effluents under The Trade Effluents (Prescribed Processes and Substances) Regulations<br>**Status:** **Application received by the EA but is not yet authorisedNot Yet Authorised**<br>Positional Accuracy: Located by supplier to within 100m | A23SE<br>(N) | 986 | 3 | 387200<br>398100 |
| | **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<br>(NE) | 0 | 3 | 386885<br>396992 |
| | **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 | A13SW<br>(NE) | 0 | 3 | 386885<br>396992 |
| | **Bedrock Aquifer Designations**<br>Aquifer Designation: Secondary Aquifer - A | A13SW<br>(NE) | 0 | 2 | 386885<br>396992 |
| | **Superficial Aquifer Designations**<br>Aquifer Designation: Unproductive Strata | A13SW<br>(NE) | 0 | 2 | 386885<br>396992 |
| | **Extreme Flooding from Rivers or Sea without Defences**<br>Type: Extent of Extreme Flooding from Rivers or Sea without Defences<br>Flood Plain Type: Fluvial Models<br>Boundary Accuracy: As Supplied | A13SW<br>(NE) | 0 | 3 | 386885<br>396992 |
| | **Extreme Flooding from Rivers or Sea without Defences**<br>Type: Extent of Extreme Flooding from Rivers or Sea without Defences<br>Flood Plain Type: Fluvial Models<br>Boundary Accuracy: As Supplied | A13NE<br>(NE) | 64 | 3 | 387092<br>397167 |
| | **Flooding from Rivers or Sea without Defences**<br>Type: Extent of Flooding from Rivers or Sea without Defences<br>Flood Plain Type: Fluvial Models<br>Boundary Accuracy: As Supplied | A13NW<br>(NW) | 0 | 3 | 386877<br>397001 |
| | **Flooding from Rivers or Sea without Defences**<br>Type: Extent of Flooding from Rivers or Sea without Defences<br>Flood Plain Type: Fluvial Models<br>Boundary Accuracy: As Supplied | A12SE<br>(W) | 136 | 3 | 386537<br>396993 |
| | **Areas Benefiting from Flood Defences**<br>None | | | | |
| | **Flood Water Storage Areas**<br>None | | | | |
| | **Flood Defences**<br>None | | | | |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Detailed River Network Lines**<br>None | | | | |
| 50 | **Detailed River Network Offline Drainage**<br>River Type: Secondary River<br>Hydrographic Area: D011 | A14NW<br>(E) | 179 | 3 | 387253<br>397116 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 51 | **Historical Landfill Sites**<br>Licence Holder: Not Supplied<br>Location: Gorton, Greater Manchester<br>Name: Preston Street<br>Operator Location: Not Supplied<br>Boundary Accuracy: As Supplied<br>Provider Reference: EAHLD16552<br>First Input Date: 31st December 1985<br>Last Input Date: 31st December 1994<br>Specified Waste Type: Not Supplied<br>EA Waste Ref: 0<br>Regis Ref: Not Supplied<br>WRC Ref: Not Supplied<br>BGS Ref: Not Supplied<br>Other Ref: F057 | A14NW<br>(E) | 483 | 3 | 387556<br>397162 |
| 52 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 104076<br>Location: Ashbury Yard, Bessemer Street, Gorton, Manchester, M11 2NW<br>Operator Name: Hope Cement Limited<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: HCI Waste TS + treatment<br>**Licence Status: Modified**<br>Issued: 30th April 2012<br>Last Modified: 21st December 2012<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | A13NE<br>(NE) | 2 | 3 | 387000<br>397100 |
| 53 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 50030<br>Location: Unit 10, Vaughan Street, West Gorton, Manchester, M12 5BT<br>Operator Name: Concorde Metals Recycling Ltd<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Metal Recycling Sites (Mixed)<br>**Licence Status: Surrendered**<br>Issued: 29th August 2003<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: 6th December 2011<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A13NW<br>(NW) | 161 | 3 | 386683<br>397182 |
| 54 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 50464<br>Location: Southside Railway Sidings, Gorton Road, Gorton, Manchester, M11 2DZ<br>Operator Name: U C S ( Manchester ) Limited<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Metal Recycling Sites (Vehicle Dismantlers)<br>**Licence Status: Transferred**<br>Issued: 19th December 2006<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A13NW<br>(N) | 176 | 3 | 386816<br>397287 |
| 54 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 50264<br>Location: Land/premises At, Gorton Road, Ardwick, Manchester, M11 2DZ<br>Operator Name: T D X Ltd<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: End of Life Vehicles<br>**Licence Status: Issued**<br>Issued: 28th February 2005<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A13NW<br>(N) | 218 | 3 | 386785<br>397317 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 55 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 50242<br>Location: 21 Textile Street , West Gorton, Manchester, M12 5DJ<br>Operator Name: Birch Lane Garage Limited<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: End of Life Vehicles<br>**Licence Status: Issued**<br>Issued: 16th July 2004<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A14NW<br>(NE) | 235 | 3 | 387250<br>397250 |
| 56 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 50275<br>Location: Land/premises At, Gorton Road, Gorton, Manchester, M11 2DZ<br>Operator Name: Auto Salvage Holtown Ltd<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: End of Life Vehicles<br>**Licence Status: Expired**<br>Issued: 14th May 2004<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A18SW<br>(N) | 265 | 3 | 386750<br>397350 |
| 57 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 104515<br>Location: Singleton's Scrap Metal, Land Of Wolveton Street, Manchester, Lancs, M11 2DU<br>Operator Name: F W Singleton Ltd<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Household, Commercial And Industrial Transfer Stations<br>**Licence Status: Issued**<br>Issued: 17th September 2012<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A18SW<br>(N) | 275 | 3 | 386845<br>397404 |
| 57 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 104629<br>Location: Singleton's Scrap Metal Ltd, Land Off Wolveton Street, Openshaw, Manchester, Lancs, M11 2DU<br>Operator Name: F W Singleton Limited<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Vehicle Depollution Facility <5000 tps<br>**Licence Status: Surrendered**<br>Issued: 20th August 2012<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: 24th October 2012<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A18SW<br>(N) | 280 | 3 | 386845<br>397409 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 58 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 50129<br>Location: Copping Street, Gorton, Manchester, M12 4RY<br>Operator Name: Lockett Helen<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Household, Commercial And Industrial Transfer Stations<br>**Licence Status: Revoked**<br>Issued: 8th September 2003<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: 15th May 2006<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A8NW<br>(S) | 280 | 3 | 386750<br>396570 |
| 59 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 50110<br>Location: Land/premises At, Redgate Lane, Gorton, Manchester, M12 4RY<br>Operator Name: Redgate Holdings Limited<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Household, Commercial And Industrial Transfer Stations<br>**Licence Status: Modified**<br>Issued: 18th March 2003<br>Last Modified: 13th October 2010<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A8NW<br>(SW) | 318 | 3 | 386677<br>396533 |
| 60 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 104595<br>Location: Iwaste Ltd, Gorton Road, Gorton, Manchester, M11 2DZ<br>Operator Name: Iwaste Ltd<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Vehicle Depollution Facility <5000 tps<br>**Licence Status: Issued**<br>Issued: 25th October 2012<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A18SW<br>(NW) | 342 | 3 | 386658<br>397372 |
| 61 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 102972<br>Location: 8 Tuley Street , Gorton, Manchester, Lancs, M11 2DY<br>Operator Name: Anyaeriuba Emmanuel<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Vehicle Depollution Facility <5000 tps<br>**Licence Status: Issued**<br>Issued: 27th July 2011<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A18SW<br>(NW) | 411 | 3 | 386652<br>397459 |
| 62 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 50363<br>Location: Rondin House, Rondin Road, Ardwick, Manchester, M12 6BF<br>Operator Name: P Mc Guinness & Co Ltd<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Household, Commercial And Industrial Transfer Stations<br>**Licence Status: Modified**<br>Issued: 21st December 2004<br>Last Modified: 24th August 2012<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A17SE<br>(NW) | 484 | 3 | 386314<br>397344 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 63 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 104965<br>Location: 22 Rondin Road , Ardwick, Manchester, M12 6BF<br>Operator Name: One51 E S Metals ( North) Limited<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Metal recycling site<br>**Licence Status: Issued**<br>Issued: 8th October 2013<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A17SE<br>(NW) | 557 | 3 | 386237<br>397366 |
| 64 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 104212<br>Location: Ashton Old Road Recycling Depot, Ashton Old Road, Manchester, M11 2XX<br>Operator Name: W Maher & Sons Ltd<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Treatment of waste to produce soil <75,000 tpy<br>**Licence Status: Issued**<br>Issued: 11th May 2012<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Un-geocodable - location cannot be found | A17SE<br>(NW) | 608 | 3 | 386370<br>397545 |
| 65 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 102091<br>Location: West Goods Yard, Rondin Road, Ardwick, Manchester, M12 6JT<br>Operator Name: Birch Skip Hire Ltd<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Household, Commercial And Industrial Transfer Stations<br>**Licence Status: Modified**<br>Issued: 7th April 2011<br>Last Modified: 2nd December 2013<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A12NW<br>(W) | 666 | 3 | 386046<br>397248 |
| 66 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 53760<br>Location: Unit 12, Rondin Road, Ardwick, Manchester, M12 6BF<br>Operator Name: Birch Skip Hire Ltd.<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Household, Commercial And Industrial Transfer Stations<br>**Licence Status: Modified**<br>Issued: 16th December 1993<br>Last Modified: 15th October 2008<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | A17SW<br>(NW) | 675 | 3 | 386200<br>397500 |
| 67 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 103692<br>Location: Operational Depot, Hooper Street, Manchester, Lancs, M12 6LA<br>Operator Name: Manchester City Council<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Inert & Excavation WTS with treatment<br>**Licence Status: Issued**<br>Issued: 15th December 2011<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A17SW<br>(NW) | 731 | 3 | 386052<br>397406 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 68 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 50105<br>Location: Units 15, Rondin Close, Ardwick, Manchester, M12 6BF<br>Operator Name: P Mc Guinness & Co Ltd<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Household, Commercial And Industrial Transfer Stations<br>**Licence Status: Modified**<br>Issued: 9th August 2002<br>Last Modified: 21st December 2004<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A17SW<br>(NW) | 731 | 3 | 386160<br>397540 |
| 69 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 53947<br>Location: A7 The Dresser Centre, Whitworth Street, Openshaw, Manchester, M11 2NE<br>Operator Name: Asbestos Clearance And Disposal Services Limited<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Household, Commercial And Industrial Transfer Stations<br>**Licence Status: Transferred**<br>Issued: 5th July 1989<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A19SE<br>(NE) | 749 | 3 | 387759<br>397394 |
| 70 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 50399<br>Location: Unit 4, Wilson Street, Openshaw, Manchester, M11 2AZ<br>Operator Name: Vanparts Limited<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: End of Life Vehicles<br>**Licence Status: Issued**<br>Issued: 16th January 2006<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A19NW<br>(NE) | 893 | 3 | 387549<br>397852 |
| 70 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 101518<br>Location: 108 Wilson Street , Openshaw, Manchester, Lancs, M11 2AZ<br>Operator Name: A S Waste Removals Ltd<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Vehicle Depollution Facility <5000 tps<br>**Licence Status: Modified**<br>Issued: 17th June 2010<br>Last Modified: 25th May 2011<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A19NE<br>(NE) | 929 | 3 | 387591<br>397868 |
| 71 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 50244<br>Location: 134 South Street , Openshaw, Manchester, M11 2FY<br>Operator Name: Steven Smith And Bernard Smith<br>Operator Location: Not Supplied<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: End of Life Vehicles<br>**Licence Status: Surrendered**<br>Issued: 20th October 2004<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: 18th August 2006<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A20SW<br>(NE) | 922 | 3 | 387913<br>397475 |

| 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 | 11 | 386885<br>396992 |
| 72 | **Registered Waste Transfer Sites**<br>Licence Holder: A Cash - Birch Plant & Waste Serv. Ltd<br>Licence Reference: 00920<br>Site Location: 12-18 Rondin Close, Ashton Old Road, MANCHESTER, Greater Manchester, M12 6LL<br>Operator Location: 1 Ashlands Avenue, New Moston, MANCHESTER, Greater Manchester, M40 0EE<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Transfer<br>Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year)<br>Waste Source Restrictions: No known restriction on source of waste<br>Licence Status: Operational as far as is knownOperational<br>Dated: 1st December 1993<br>Preceded By Licence: Not Given<br>Superseded By Licence: Not Given<br>Positional Accuracy: Manually positioned to the road within the address or location<br>Boundary Quality: Not Supplied<br>Authorised Waste: Electrical Fitt'Gs/Fixt/Appliances<br>Empty Used Containers<br>Fired Enamels,Ceramics,Mica<br>Glass,Pottery,China<br>Gmwda Group 2 - Slow Decomp./Slight So<br>Max.Storage In Licence<br>Scrap Mach'Y/Equip,Ferrous/Non-Ferrous<br>Uncontam. Soil,Clay,Sand<br>Uncontam. Stone, Brickwork, Concrete<br>Uncontam.Rubble, Hardcore<br>Prohibited Waste: Explosive Waste<br>Liquid Wastes<br>Pressurized Containers/Waste Therein<br>Sludge Wastes<br>Special Wastes<br>Violently Reactive Wastes<br>Waste In Drums<br>Waste N.O.S. | A17SE<br>(NW) | 641 | 3 | 386250<br>397500 |
| 73 | **Registered Waste Transfer Sites**<br>Licence Holder: L Wynne & Co (Mcr) Ltd<br>Licence Reference: 00545<br>Site Location: The Dresser Centre, Whitworth Street, MANCHESTER, Greater Manchester, M11 2NE<br>Operator Location: As Site Address<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Transfer<br>Max Input Rate: Very Small (Less than 10,000 tonnes per year)<br>Waste Source Restrictions: Waste produced/controlled by licence holder<br>Licence Status: Operational as far as is knownOperational<br>Dated: 1st July 1989<br>Preceded By Licence: Not Given<br>Superseded By Licence: Not Given<br>Positional Accuracy: Manually positioned to the address or location<br>Boundary Quality: Not Supplied<br>Authorised Waste: Asbestos<br>Prohibited Waste: Waste N.O.S. | A14NE<br>(E) | 740 | 3 | 387780<br>397310 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 74 | **Registered Waste Transfer Sites**<br>Licence Holder: City Of Manchester Council - City Works<br>Licence Reference: 00428/M02<br>Site Location: Bessemer Street Works, Openshaw, Manchester, Greater Manchester<br>Operator Location: Pink Bank Lane, Belle Vue, MANCHESTER, Greater Manchester, M12 5QN<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Transfer<br>Max Input Rate: Very Small (Less than 10,000 tonnes per year)<br>Waste Source Restrictions: Waste produced/controlled by licence holder<br>Licence Status: Operational as far as is knownOperational<br>Dated: 1st April 1997<br>Preceded By Licence: 00428/M01<br>Superseded By Licence: Not Given<br>Positional Accuracy: Manually positioned to the address or location<br>Boundary Quality: Not Supplied<br>Authorised Waste Asbestos Lagging/Fibre/Powder/Cement<br>Cli.Waste - Sharps<br>Gmwda Group 1 - Non/V.Slow Decomp.Wast<br>Gmwda Group 2 - Slow Decomp./Slight So<br>Gmwda Group 3 - Decomp./Sol.Waste Most<br>Max.Waste Permitted By Licence<br>Prohibited Waste Waste N.O.S. | A15NW<br>(E) | 948 | 3 | 388000<br>397300 |
| 74 | **Registered Waste Transfer Sites**<br>Licence Holder: City Of Manchester M.B.C.<br>Licence Reference: 00428/M01<br>Site Location: Bessemer Street Works, Openshaw, Manchester, Greater Manchester<br>Operator Location: Salisbury House, Granby Row, MANCHESTER, Greater Manchester, M1 7AH<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Transfer<br>Max Input Rate: Very Small (Less than 10,000 tonnes per year)<br>Waste Source Restrictions: Waste produced/controlled by licence holder<br>Licence Status: Record supersededSuperseded<br>Dated: 1st August 1986<br>Preceded By Licence: Not Given<br>Superseded By Licence: 00428/M02<br>Positional Accuracy: Manually positioned to the address or location<br>Boundary Quality: Not Supplied<br>Authorised Waste Asbestos | A15NW<br>(E) | 948 | 3 | 388000<br>397300 |
| 75 | **Registered Waste Transfer Sites**<br>Licence Holder: A S Race<br>Licence Reference: 00424/86/M2<br>Site Location: Preston Street, Gorton, Manchester, Greater Manchester<br>Operator Location: 2 Broom Lane, Levenshulme, Manchester, Greater Manchester<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Transfer<br>Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year)<br>Waste Source Restrictions: No known restriction on source of waste<br>Licence Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled<br>Dated: 1st January 1987<br>Preceded By Licence: Not Given<br>Superseded By Licence: Not Given<br>Positional Accuracy: Manually positioned to the road within the address or location<br>Boundary Quality: Not Supplied<br>Authorised Waste Construction Ind. Wastes<br>Household + Commercial Waste<br>Ind. Non-Haz. Inert, Non-Flammable<br>Ind. Non-Haz. Potentially Combustible<br>Old Cars/Vehicles/Trailers Etc | A15SW<br>(E) | 972 | 3 | 388080<br>396900 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 76 | **Registered Waste Treatment or Disposal Sites**<br>Licence Holder: P Mc Guinness & Co<br>Licence Reference: 00776<br>Site Location: Rondin Close, Ashton Old Road, Manchester, Greater Manchester<br>Operator Location: As Site Address<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Treatment<br>Max Input Rate: Undefined<br>Waste Source Restrictions: No known restriction on source of waste<br>Licence Status: Site exempt from licenceExempt<br>Dated: 1st June 1995<br>Preceded By Licence: Not Given<br>Superseded By Licence: Not Given<br>Positional Accuracy: Manually positioned to the road within the address or location<br>Boundary Quality: Not Supplied<br>Authorised Waste Licenced Wastes Not To Hand | A17SW<br>(NW) | 696 | 3 | 386170<br>397500 |
| 77 | **Registered Waste Treatment or Disposal Sites**<br>Licence Holder: Delta Containers Ltd<br>Licence Reference: 00765<br>Site Location: Preston Street, Gorton, MANCHESTER, Greater Manchester, M18 8DB<br>Operator Location: Mere House, South Park Drive, POYNTON, Cheshire, SK12 1BS<br>Authority: Environment Agency - North West Region, South Area<br>Site Category: Recycling Drums<br>Max Input Rate: Very Small (Less than 10,000 tonnes per year)<br>Waste Source Restrictions: No known restriction on source of waste<br>Licence Status: Operational as far as is knownOperational<br>Dated: 1st July 1998<br>Preceded By Licence: Not Given<br>Superseded By Licence: Not Given<br>Positional Accuracy: Positioned by the supplier<br>Boundary Quality: Good<br>Authorised Waste 25 L Steel/Plastic Drums Of Solid Glue<br>Empty Used Ibcs<br>Empty Used Steel/Plastic Drums < 230 L<br>Max.Waste Permitted By Licence<br>Packages,Cont'Rs,Ibcs With Residues<br>Prohibited Waste Any With Res.List I Subs In 80/68/Eec<br>Any With Res.Presc.List Subs(Eppsp'91)<br>Hazardous Waste Residues<br>Waste N.O.S. | A14SE<br>(E) | 758 | 3 | 387868<br>396979 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS 1:625,000 Solid Geology**<br>Description: Warwickshire Group | A13SW<br>(NE) | 0 | 2 | 386885<br>396992 |
| | **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 | A13NE<br>(E) | 0 | 2 | 387000<br>397000 |
| | **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: 300 - 600 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A13NE<br>(E) | 0 | 2 | 387000<br>397016 |
| | **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 - 2.2 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 300 - 600 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A13NW<br>(N) | 0 | 2 | 386885<br>397000 |
| | **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 - 2.2 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 300 - 600 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A13NE<br>(NE) | 0 | 2 | 386949<br>397041 |
| | **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 - 2.2 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 300 - 600 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A13NE<br>(NE) | 0 | 2 | 386966<br>397057 |
| | **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<br>(NE) | 0 | 2 | 386885<br>396992 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
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| | **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 | A13SE<br>(E) | 0 | 2 | 387000<br>396992 |
| | **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 | A13NE<br>(E) | 0 | 2 | 387013<br>397000 |
| | **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 | A13SE<br>(E) | 0 | 2 | 387000<br>396978 |
| | **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 | A13NE<br>(E) | 0 | 2 | 386982<br>397000 |
| | **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: 300 - 600 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A13NE<br>(NE) | 49 | 2 | 387089<br>397156 |
| | **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<br>(SW) | 96 | 2 | 386616<br>396828 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
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| | **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 | A13NE<br>(E) | 108 | 2 | 387214<br>397000 |
| | **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 - 2.2 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 300 - 600 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A13NE<br>(N) | 137 | 2 | 387000<br>397275 |
| | **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 | A12NE<br>(W) | 160 | 2 | 386512<br>397000 |
| | **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 | A12SE<br>(SW) | 254 | 2 | 386477<br>396753 |
| | **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 | A14SW<br>(E) | 320 | 2 | 387429<br>396994 |
| | **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 | A14NW<br>(E) | 321 | 2 | 387430<br>397000 |

| 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 | A12NE<br>(W) | 339 | 2 | 386332<br>397000 |
| | **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 | A12SE<br>(SW) | 369 | 2 | 386388<br>396676 |
| | **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 | A12SE<br>(SW) | 414 | 2 | 386342<br>396669 |
| | **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 | A7NE<br>(SW) | 422 | 2 | 386390<br>396582 |
| | **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: 300 - 600 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A19SW<br>(NE) | 465 | 2 | 387409<br>397419 |
| | **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 | A12NW<br>(W) | 492 | 2 | 386180<br>397000 |

| 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 | A12NW<br>(W) | 563 | 2 | 386108<br>397000 |
| | **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 | A7SE<br>(SW) | 578 | 2 | 386544<br>396298 |
| | **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 | A12NW<br>(W) | 671 | 2 | 386000<br>397000 |
| | **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 | A12SW<br>(W) | 671 | 2 | 386000<br>396992 |
| | **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 | A12SW<br>(W) | 673 | 2 | 386000<br>396964 |
| | **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 | A12NW<br>(W) | 676 | 2 | 386000<br>397096 |

| 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 | A12NW<br>(W) | 696 | 2 | 385975<br>397000 |
| | **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 | A8SE<br>(S) | 700 | 2 | 387000<br>396202 |
| | **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 | A12NW<br>(W) | 722 | 2 | 386000<br>397283 |
| | **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 | A7NW<br>(W) | 740 | 2 | 386000<br>396655 |
| | **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 | A7NW<br>(SW) | 765 | 2 | 386154<br>396331 |
| | **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 - 2.2 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 300 - 600 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A18NE<br>(N) | 781 | 2 | 387000<br>397921 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
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| | **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 | A7SE<br>(SW) | 798 | 2 | 386291<br>396174 |
| | **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 | A7NW<br>(SW) | 808 | 2 | 386000<br>396473 |
| | **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 | A8SW<br>(S) | 848 | 2 | 386811<br>396000 |
| | **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 | A8SW<br>(S) | 849 | 2 | 386694<br>396000 |
| | **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 | A8SW<br>(S) | 853 | 2 | 386885<br>396000 |
| | **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 - 2.2 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 300 - 600 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A18NE<br>(N) | 860 | 2 | 386939<br>398000 |

| 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: 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: 30 - 45 mg/kg | A18NE<br>(N) | 860 | 2 | 387000<br>398000 |
| | **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 - 2.2 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 300 - 600 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A18NW<br>(N) | 861 | 2 | 386885<br>398000 |
| | **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 | A17SW<br>(NW) | 875 | 2 | 386000<br>397579 |
| | **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 | A8SE<br>(S) | 875 | 2 | 386938<br>396000 |
| | **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 | A15SW<br>(E) | 889 | 2 | 388000<br>396992 |
| | **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 | A7SE<br>(SW) | 889 | 2 | 386453<br>396000 |

| 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: 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 | A15NW<br>(E) | 890 | 2 | 388000<br>397000 |
| | **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 | A11NE<br>(W) | 892 | 2 | 385779<br>397000 |
| | **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 | A8SE<br>(S) | 892 | 2 | 387000<br>396000 |
| | **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 | A8SE<br>(S) | 931 | 2 | 387130<br>396000 |
| | **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 | A7SE<br>(SW) | 931 | 2 | 386337<br>396000 |
| | **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 - 2.2 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 300 - 600 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A17NE<br>(N) | 949 | 2 | 386515<br>398000 |

| 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 | A3NE<br>(S) | 987 | 2 | 387000<br>395900 |
| 78 | **BGS Recorded Mineral Sites**<br>Site Name: Gorton Fire Brick Works<br>Location: Ashton Old Road, Gorton, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29590<br>Type: Opencast<br>**Status:** **Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Fireclay<br>Positional Accuracy: Located by supplier to within 10m | A19SW<br>(NE) | 371 | 2 | 387255<br>397420 |
| 79 | **BGS Recorded Mineral Sites**<br>Site Name: Ardwick Brick Field<br>Location: Ashton Old Road, Ardwick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29588<br>Type: Opencast<br>**Status:** **Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A17SE<br>(NW) | 468 | 2 | 386450<br>397430 |
| 80 | **BGS Recorded Mineral Sites**<br>Site Name: Beswick Brick Field<br>Location: , Beswick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29586<br>Type: Opencast<br>**Status:** **Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A18SW<br>(N) | 505 | 2 | 386780<br>397625 |
| 81 | **BGS Recorded Mineral Sites**<br>Site Name: Steels Buildings Clay Pit<br>Location: Ashton Old Road, Ardwick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29589<br>Type: Opencast<br>**Status:** **Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A19SW<br>(NE) | 573 | 2 | 387328<br>397610 |
| 82 | **BGS Recorded Mineral Sites**<br>Site Name: Beswick Brick Field<br>Location: , Beswick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29585<br>Type: Opencast<br>**Status:** **Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A18NW<br>(N) | 649 | 2 | 386635<br>397725 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 83 | **BGS Recorded Mineral Sites**<br>Site Name: Ardwick Lime Works Pit<br>Location: Ashton Old Road, Ardwick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29580<br>Type: Underground<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Carboniferous<br>Geology: Great Mine Limestone<br>Commodity: Limestone<br>Positional Accuracy: Located by supplier to within 10m | A17SE<br>(NW) | 670 | 2 | 386340<br>397600 |
| 83 | **BGS Recorded Mineral Sites**<br>Site Name: Ashton Road Brick Field<br>Location: Ahston Old Road, Ardwick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29593<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A17SE<br>(NW) | 705 | 2 | 386305<br>397620 |
| 84 | **BGS Recorded Mineral Sites**<br>Site Name: Ashbury Rail Depot<br>Location: Bessemer Street, West Gorton, Manchester, M11 2nw<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 16865<br>Type: Rail Depot<br>**Status: Active**<br>Operator: Hope Construction Materials<br>Operator Location: Hope Construction Materials, Berkeley House, 3rd Floor, Berkeley Square, Mayfair, London, W1j 6bu<br>Periodic Type: Carboniferous<br>Geology: Carboniferous Limestone<br>Commodity: Crushed Rock<br>Positional Accuracy: Located by supplier to within 10m | A14NE<br>(E) | 716 | 2 | 387794<br>397181 |
| 85 | **BGS Recorded Mineral Sites**<br>Site Name: Ardwick Brick Field<br>Location: Ashton Old Road, Ardwick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29587<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A17SW<br>(NW) | 725 | 2 | 386130<br>397500 |
| 86 | **BGS Recorded Mineral Sites**<br>Site Name: Ardwick Lime Works Pits<br>Location: Bellew Street, Ardwick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29599<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Carboniferous<br>Geology: Great Mine Limestone<br>Commodity: Limestone<br>Positional Accuracy: Located by supplier to within 10m | A17NE<br>(NW) | 754 | 2 | 386295<br>397670 |
| 87 | **BGS Recorded Mineral Sites**<br>Site Name: Beswick Brick Field<br>Location: , Beswick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29584<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A17NE<br>(NW) | 769 | 2 | 386450<br>397755 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Recorded Mineral Sites** | | | | |
| 88 | Site Name: Beswick Brick Field<br>Location: , Beswick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29583<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A17NE<br>(NW) | 826 | 2 | 386280<br>397745 |
| | **BGS Recorded Mineral Sites** | | | | |
| 89 | Site Name: North Street Brick Works<br>Location: , Openshaw, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29594<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A19SE<br>(NE) | 924 | 2 | 387805<br>397660 |
| | **BGS Recorded Mineral Sites** | | | | |
| 90 | Site Name: Ardwick Lime Works Pits<br>Location: Ferry Street, Ardwick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29598<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Carboniferous<br>Geology: Great Mine Limestone<br>Commodity: Limestone<br>Positional Accuracy: Located by supplier to within 10m | A17NW<br>(NW) | 930 | 2 | 386170<br>397800 |
| | **BGS Recorded Mineral Sites** | | | | |
| 91 | Site Name: Beswick Brick Field<br>Location: , Beswick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29582<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A17NE<br>(NW) | 933 | 2 | 386250<br>397850 |
| | **BGS Measured Urban Soil Chemistry** | | | | |
| | Source: British Geological Survey, National Geoscience Information Service<br>Grid: 386770, 396730<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 11.00 mg/kg<br>Cadmium Measured Concentration: 0.80 mg/kg<br>Chromium Measured Concentration: 60.00 mg/kg<br>Lead Measured Concentration: 109.00 mg/kg<br>Nickel Measured Concentration: 17.00 mg/kg | A13SW<br>(SW) | 127 | 2 | 386770<br>396730 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 386760, 397280<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 20.00 mg/kg<br>Cadmium Measured Concentration: 1.70 mg/kg<br>Chromium Measured Concentration: 88.00 mg/kg<br>Lead Measured Concentration: 360.00 mg/kg<br>Nickel Measured Concentration: 30.00 mg/kg | A13NW<br>(NW) | 205 | 2 | 386760<br>397280 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 387250, 397330<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 15.00 mg/kg<br>Cadmium Measured Concentration: 0.70 mg/kg<br>Chromium Measured Concentration: 62.00 mg/kg<br>Lead Measured Concentration: 214.00 mg/kg<br>Nickel Measured Concentration: 30.00 mg/kg | A14NW<br>(NE) | 293 | 2 | 387250<br>397330 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 387290, 396630<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 19.00 mg/kg<br>Cadmium Measured Concentration: 0.60 mg/kg<br>Chromium Measured Concentration: 70.00 mg/kg<br>Lead Measured Concentration: 153.00 mg/kg<br>Nickel Measured Concentration: 29.00 mg/kg | A9NW<br>(SE) | 383 | 2 | 387290<br>396630 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 386280, 397320<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 20.00 mg/kg<br>Cadmium Measured Concentration: 0.60 mg/kg<br>Chromium Measured Concentration: 81.00 mg/kg<br>Lead Measured Concentration: 163.00 mg/kg<br>Nickel Measured Concentration: 42.00 mg/kg | A12NE<br>(NW) | 495 | 2 | 386280<br>397320 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 386170, 396760<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 13.00 mg/kg<br>Cadmium Measured Concentration: 0.70 mg/kg<br>Chromium Measured Concentration: 63.00 mg/kg<br>Lead Measured Concentration: 183.00 mg/kg<br>Nickel Measured Concentration: 24.00 mg/kg | A12SW<br>(W) | 545 | 2 | 386170<br>396760 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 386770, 397750<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 18.00 mg/kg<br>Cadmium Measured Concentration: 0.70 mg/kg<br>Chromium Measured Concentration: 60.00 mg/kg<br>Lead Measured Concentration: 173.00 mg/kg<br>Nickel Measured Concentration: 22.00 mg/kg | A18NW<br>(N) | 629 | 2 | 386770<br>397750 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 386900, 396230<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 22.00 mg/kg<br>Cadmium Measured Concentration: 1.20 mg/kg<br>Chromium Measured Concentration: 82.00 mg/kg<br>Lead Measured Concentration: 260.00 mg/kg<br>Nickel Measured Concentration: 44.00 mg/kg | A8SE<br>(S) | 643 | 2 | 386900<br>396230 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 387770, 396790<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 19.00 mg/kg<br>Cadmium Measured Concentration: 0.30 mg/kg<br>Chromium Measured Concentration: 99.00 mg/kg<br>Lead Measured Concentration: 183.00 mg/kg<br>Nickel Measured Concentration: 33.00 mg/kg | A14SE<br>(E) | 683 | 2 | 387770<br>396790 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 387270, 397760<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 21.00 mg/kg<br>Cadmium Measured Concentration: 0.70 mg/kg<br>Chromium Measured Concentration: 78.00 mg/kg<br>Lead Measured Concentration: 360.00 mg/kg<br>Nickel Measured Concentration: 34.00 mg/kg | A19NW<br>(NE) | 686 | 2 | 387270<br>397760 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 387750, 397440<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 14.00 mg/kg<br>Cadmium Measured Concentration: 1.00 mg/kg<br>Chromium Measured Concentration: 120.00 mg/kg<br>Lead Measured Concentration: 242.00 mg/kg<br>Nickel Measured Concentration: 32.00 mg/kg | A19SE<br>(NE) | 760 | 2 | 387750<br>397440 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 386210, 396280<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 14.00 mg/kg<br>Cadmium Measured Concentration: 0.30 mg/kg<br>Chromium Measured Concentration: 55.00 mg/kg<br>Lead Measured Concentration: 81.00 mg/kg<br>Nickel Measured Concentration: 17.00 mg/kg | A7SW<br>(SW) | 762 | 2 | 386210<br>396280 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 387330, 396200<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 29.00 mg/kg<br>Cadmium Measured Concentration: 0.80 mg/kg<br>Chromium Measured Concentration: 88.00 mg/kg<br>Lead Measured Concentration: 225.00 mg/kg<br>Nickel Measured Concentration: 43.00 mg/kg | A9SW<br>(SE) | 799 | 2 | 387330<br>396200 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 386250, 397830<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 15.00 mg/kg<br>Cadmium Measured Concentration: 0.50 mg/kg<br>Chromium Measured Concentration: 60.00 mg/kg<br>Lead Measured Concentration: 126.00 mg/kg<br>Nickel Measured Concentration: 19.00 mg/kg | A17NE<br>(NW) | 916 | 2 | 386250<br>397830 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 385770, 396770<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 15.00 mg/kg<br>Cadmium Measured Concentration: 0.30 mg/kg<br>Chromium Measured Concentration: 80.00 mg/kg<br>Lead Measured Concentration: 97.00 mg/kg<br>Nickel Measured Concentration: 38.00 mg/kg | A11SE<br>(W) | 933 | 2 | 385770<br>396770 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 387790, 396320<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 15.00 mg/kg<br>Cadmium Measured Concentration: 0.50 mg/kg<br>Chromium Measured Concentration: 65.00 mg/kg<br>Lead Measured Concentration: 213.00 mg/kg<br>Nickel Measured Concentration: 22.00 mg/kg | A9NE<br>(SE) | 939 | 2 | 387790<br>396320 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 387750, 397750<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 11.00 mg/kg<br>Cadmium Measured Concentration: 0.60 mg/kg<br>Chromium Measured Concentration: 79.00 mg/kg<br>Lead Measured Concentration: 56.00 mg/kg<br>Nickel Measured Concentration: 51.00 mg/kg | A19NE<br>(NE) | 941 | 2 | 387750<br>397750 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 385810, 397450<br>Soil Sample Type: Topsoil<br>Sample Area: Manchester<br>Arsenic Measured Concentration: 24.00 mg/kg<br>Cadmium Measured Concentration: 2.10 mg/kg<br>Chromium Measured Concentration: 110.00 mg/kg<br>Lead Measured Concentration: 201.00 mg/kg<br>Nickel Measured Concentration: 31.00 mg/kg | A16SE<br>(NW) | 964 | 2 | 385810<br>397450 |
| | **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 | A13SW<br>(NE) | 0 | 2 | 386885<br>396992 |
| | **Coal Mining Affected Areas**<br>Description: In an area which may be affected by coal mining activity. It is recommended that a coal mining report is obtained from the Coal Authority. Contact details are included in the Useful Contacts section of this report. | A13SW<br>(NE) | 0 | 5 | 386885<br>396992 |
| | **Mining Instability**<br>Mining Evidence: Inconclusive Coal Mining<br>Source: Ove Arup & Partners<br>Boundary Quality: As Supplied | A13SW<br>(NE) | 0 | - | 386885<br>396992 |
| | **Mining Instability**<br>Mining Evidence: Conclusive Rock Mining<br>Source: Ove Arup & Partners<br>Boundary Quality: As Supplied | A13SW<br>(NE) | 0 | - | 386885<br>396992 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Man-Made Mining Cavities**<br>Easting: 387000<br>Northing: 398000<br>Distance: 860<br>Quadrant Reference: A18<br>Quadrant Reference: NE<br>Bearing Ref: N<br>Cavity Type: Not supplied<br>Commodity: Limestone<br>Solid Geology Detail: Carboniferous Coal Measures<br>Superficial Geology Detail: Glacial Till | A18NE<br>(N) | 860 | 6 | 387000<br>398000 |
| | **Non Coal Mining Areas of Great Britain**<br>Risk: Rare<br>Source: British Geological Survey, National Geoscience Information Service | A13NE<br>(NE) | 49 | 2 | 387089<br>397156 |
| | **Non Coal Mining Areas of Great Britain**<br>Risk: Likely<br>Source: British Geological Survey, National Geoscience Information Service | A13NW<br>(NW) | 196 | 2 | 386600<br>397200 |
| | **Potential for Collapsible Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SW<br>(NE) | 0 | 2 | 386885<br>396992 |
| | **Potential for Compressible Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13SW<br>(NE) | 0 | 2 | 386885<br>396992 |
| | **Potential for Compressible Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13NW<br>(N) | 97 | 2 | 386889<br>397233 |
| | **Potential for Ground Dissolution Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13NE<br>(NE) | 0 | 2 | 386921<br>397020 |
| | **Potential for Ground Dissolution Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13SW<br>(NE) | 0 | 2 | 386885<br>396992 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SW<br>(NE) | 0 | 2 | 386885<br>396992 |
| | **Potential for Running Sand Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SW<br>(NE) | 0 | 2 | 386885<br>396992 |
| | **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SW<br>(NE) | 0 | 2 | 386885<br>396992 |
| | **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 | A13SW<br>(NE) | 0 | 2 | 386885<br>396992 |
| | **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<br>(N) | 0 | 2 | 386885<br>397001 |
| | **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 | A13SW<br>(NE) | 0 | 2 | 386885<br>396992 |
| | **Radon Potential - Radon Affected Areas**<br>Affected Area: The property is in an intermediate probability radon area, as between 1 and 3% of homes are above the action level<br>Source: British Geological Survey, National Geoscience Information Service | A13NW<br>(N) | 0 | 2 | 386885<br>397001 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 92 | **Contemporary Trade Directory Entries**<br>Name: Baric Pumps Ltd<br>Location: 33, Aines Street, Manchester, Lancashire, M12 5BU<br>Classification: Pumps - Sales, Servicing & Repairs<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13NE<br>(E) | 0 | - | 387032<br>397029 |
| 93 | **Contemporary Trade Directory Entries**<br>Name: Armstrong Holden Brooke Pullen<br>Location: Wenlock Way, Manchester, M12 5JL<br>Classification: Pump Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13SE<br>(E) | 0 | - | 387076<br>396988 |
| 93 | **Contemporary Trade Directory Entries**<br>Name: Armstrong Intergrated Ltd<br>Location: Wenlock Way, Manchester, Lancashire, M12 5JL<br>Classification: Pumps - Sales, Servicing & Repairs<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13SE<br>(E) | 0 | - | 387076<br>396988 |
| 94 | **Contemporary Trade Directory Entries**<br>Name: Fts Manchester Ltd<br>Location: Olympic House,Bennett St, Manchester, M12 5AP<br>Classification: Road Haulage Services<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A13NW<br>(W) | 5 | - | 386756<br>397030 |
| 95 | **Contemporary Trade Directory Entries**<br>Name: Deltic Engineering Ltd<br>Location: Unit 8a Vaughan St, Manchester, M12 5DU<br>Classification: Machinery - Industrial & Commercial<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A13NE<br>(N) | 8 | - | 386893<br>397120 |
| 95 | **Contemporary Trade Directory Entries**<br>Name: Smart Form<br>Location: Unit 11,Vaughan St, Manchester, Lancashire, M12 5DU<br>Classification: Tube Bending<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A13NE<br>(N) | 8 | - | 386892<br>397114 |
| 95 | **Contemporary Trade Directory Entries**<br>Name: Fitlock<br>Location: Unit 6,Vaughan St Ind Est, Manchester, Lancashire, M12 5BT<br>Classification: Nuts, Bolts & Fixings<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A13NW<br>(N) | 45 | - | 386862<br>397148 |
| 96 | **Contemporary Trade Directory Entries**<br>Name: Minara Foods Ltd<br>Location: 153, Bennett Street, Manchester, M12 5BW<br>Classification: Food Products - Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13NW<br>(W) | 29 | - | 386703<br>397051 |
| 97 | **Contemporary Trade Directory Entries**<br>Name: P C Services<br>Location: Cumber House, Bennett Street, Manchester, M12 5BW<br>Classification: Printed Circuit Services<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13NW<br>(NW) | 41 | - | 386821<br>397069 |
| 97 | **Contemporary Trade Directory Entries**<br>Name: Ardwick Auto Salvage<br>Location: Cumber House, Bennett Street, Ardwick, Manchester, M12 5BW<br>Classification: Car Breakdown & Recovery Services<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13NW<br>(NW) | 41 | - | 386821<br>397069 |
| 97 | **Contemporary Trade Directory Entries**<br>Name: M & M Vehicle Painters<br>Location: Unit 7, Vaughan Street, Manchester, Lancashire, M12 5DU<br>Classification: Car Painters & Sprayers<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A13NW<br>(N) | 62 | - | 386844<br>397147 |
| 97 | **Contemporary Trade Directory Entries**<br>Name: C & W Production Engineering Ltd<br>Location: Unit 9, Vaughan Street Industrial Estate, Manchester, M12 5BT<br>Classification: Machine Shops<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13NW<br>(NW) | 70 | - | 386826<br>397108 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 97 | **Contemporary Trade Directory Entries**<br>Name: C & W Production Engineering Ltd<br>Location: Unit 9, Vaughan Street Industrial Estate, Manchester, M12 5BT<br>Classification: Engineers - General<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13NW<br>(NW) | 70 | - | 386826<br>397108 |
| 97 | **Contemporary Trade Directory Entries**<br>Name: C & W Production Engineering Ltd<br>Location: Unit 9, Vaughan Street Industrial Estate, Manchester, M12 5BT<br>Classification: Engineers - General<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13NW<br>(NW) | 70 | - | 386826<br>397108 |
| 97 | **Contemporary Trade Directory Entries**<br>Name: C & W Production Engineering Ltd<br>Location: Unit 9, Vaughan Street Industrial Estate, Manchester, Lancashire, M12 5BT<br>Classification: Engineering Machine Services<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13NW<br>(NW) | 70 | - | 386826<br>397108 |
| 97 | **Contemporary Trade Directory Entries**<br>Name: Eaves Machining<br>Location: Unit 9, Vaughan Street Industrial Estate, MANCHESTER, M12 5BT<br>Classification: Engineers - General<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A13NW<br>(NW) | 70 | - | 386826<br>397108 |
| 97 | **Contemporary Trade Directory Entries**<br>Name: Advance Autos<br>Location: Unit 9, Vaughan Street Industrial Estate, Manchester, M12 5BT<br>Classification: Commercial Vehicle Servicing, Repairs, Parts & Accessories<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A13NW<br>(NW) | 70 | - | 386826<br>397108 |
| 97 | **Contemporary Trade Directory Entries**<br>Name: Eagle Precision Technologies (Europe) Ltd<br>Location: Unit 8, Vaughan Street Industrial Estate, Manchester, M12 5BT<br>Classification: Machine Tools - Manufacturers & Distributors<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13NW<br>(NW) | 94 | - | 386811<br>397143 |
| 98 | **Contemporary Trade Directory Entries**<br>Name: S R H<br>Location: Brook Business Complex,Bennett St, Manchester, Lancashire, M12 5AU<br>Classification: Lifting Equipment<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A13NW<br>(W) | 42 | - | 386629<br>397015 |
| 98 | **Contemporary Trade Directory Entries**<br>Name: S R H<br>Location: Brook Business Complex,Bennett St, Manchester, Lancashire, M12 5AU<br>Classification: Lifting Equipment<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned within the geographical locality | A13NW<br>(W) | 53 | - | 386626<br>397046 |
| 99 | **Contemporary Trade Directory Entries**<br>Name: Loomland Ltd<br>Location: Unit 4, Vaughan Street Industrial Estate, Manchester, M12 5BT<br>Classification: T-Shirts<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A13NE<br>(N) | 59 | - | 386905<br>397194 |
| 100 | **Contemporary Trade Directory Entries**<br>Name: S R H Lifting Equiptment<br>Location: Brook Business Complex,Bennett St, Manchester, Lancashire, M12 5AU<br>Classification: Lifting Equipment<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned within the geographical locality | A13NW<br>(W) | 60 | - | 386652<br>397074 |
| 101 | **Contemporary Trade Directory Entries**<br>Name: M D Commercials Ltd<br>Location: Unit 1, Vaughan Street Industrial Estate, MANCHESTER, M12 5BT<br>Classification: Car Painters & Sprayers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13NW<br>(N) | 65 | - | 386873<br>397193 |
| 101 | **Contemporary Trade Directory Entries**<br>Name: Cvr Commercials<br>Location: Unit 2,Vaughan St Ind Est, Manchester, Lancashire, M12 5BT<br>Classification: Garage Services<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A13NW<br>(N) | 105 | - | 386829<br>397208 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 101 | **Contemporary Trade Directory Entries**<br>Name: Loomland<br>Location: Unit 4, Vaughan Street Industrial Estate, Manchester, Lancashire, M12 5BT<br>Classification: T-Shirts<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13NW<br>(N) | 106 | - | 386842<br>397221 |
| 102 | **Contemporary Trade Directory Entries**<br>Name: Balmoral Food Service<br>Location: Unit 1 Ashburys Business Park,Gorton Rd, Manchester, M12 5DX<br>Classification: Meat - Wholesale<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A13NE<br>(NE) | 68 | - | 386976<br>397208 |
| 103 | **Contemporary Trade Directory Entries**<br>Name: A & K Engineering<br>Location: Unit 14, Vaughan Street Industrial Estate, Manchester, M12 5BT<br>Classification: Hydraulic Engineers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A13NW<br>(NW) | 114 | - | 386692<br>397135 |
| 103 | **Contemporary Trade Directory Entries**<br>Name: Hydraulics Manchester Ltd<br>Location: Unit 16, Vaughan Street Industrial Estate, Manchester, M12 5BT<br>Classification: Hydraulic Equipment & Accessories - Sales & Service<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A13NW<br>(NW) | 114 | - | 386692<br>397135 |
| 104 | **Contemporary Trade Directory Entries**<br>Name: Mg Waste Management<br>Location: Unit 2, Vaughan Street Industrial Estate, Manchester, M12 5BT<br>Classification: Recycling Services<br>**Status: Active**<br>Positional Accuracy: Manually positioned within the geographical locality | A13NW<br>(NW) | 114 | - | 386787<br>397141 |
| 104 | **Contemporary Trade Directory Entries**<br>Name: S F D Welding & Fabrication<br>Location: Unit 9a,Vaughan St Ind Est, Manchester, M12 5BT<br>Classification: Wrought Ironwork<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned within the geographical locality | A13NW<br>(NW) | 129 | - | 386787<br>397188 |
| 105 | **Contemporary Trade Directory Entries**<br>Name: Autocenter<br>Location: Unit 5, Regal Industrial Estate, Gorton Road, Manchester, M12 5BX<br>Classification: Car Body Repairs<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13NE<br>(NE) | 137 | - | 387115<br>397228 |
| 105 | **Contemporary Trade Directory Entries**<br>Name: Autocenter<br>Location: Unit 5, Regal Industrial Estate, Gorton Road, Manchester, Lancashire, M12 5BX<br>Classification: Garage Services<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A13NE<br>(NE) | 137 | - | 387115<br>397228 |
| 105 | **Contemporary Trade Directory Entries**<br>Name: Frederick Law<br>Location: Regal Ind Est,Gorton Rd, Manchester, Lancashire, M12 5BX<br>Classification: Printers<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned within the geographical locality | A13NE<br>(NE) | 149 | - | 387156<br>397220 |
| 106 | **Contemporary Trade Directory Entries**<br>Name: R & P Body Repairs<br>Location: Unit 1,Conway House,Clowes St, Manchester, Lancashire, M12 5JE<br>Classification: Car & Commercial Repairs<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A13SW<br>(SW) | 140 | - | 386627<br>396742 |
| 107 | **Contemporary Trade Directory Entries**<br>Name: Dietiker Metals (Uk) Ltd<br>Location: Unit 10,Vaughan St, Manchester, Lancashire, M12 5DU<br>Classification: Scrap Metal Merchants<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A13NW<br>(NW) | 158 | - | 386655<br>397176 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 107 | **Contemporary Trade Directory Entries**<br>Name: Eaves Machining Ltd<br>Location: Unit 10,Vaughan St Ind Est, Manchester, Lancashire, M12 5BT<br>Classification: Engineering Services<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A13NW<br>(NW) | 158 | - | 386655<br>397176 |
| 107 | **Contemporary Trade Directory Entries**<br>Name: Samuel Walker & Sons Ltd<br>Location: Unit 10A, Vaughan Street Industrial Estate, Manchester, M12 5BT<br>Classification: Crane Hire, Sales & Service<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13NW<br>(NW) | 159 | - | 386655<br>397177 |
| 107 | **Contemporary Trade Directory Entries**<br>Name: Concorde Metals Recycling<br>Location: Unit 10, Vaughan Street Industrial Estate, Manchester, M12 5BT<br>Classification: Recycling Centres<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13NW<br>(NW) | 159 | - | 386655<br>397177 |
| 108 | **Contemporary Trade Directory Entries**<br>Name: Budget Pest Control<br>Location: 23d, Trowtree Avenue, Manchester, M12 5LR<br>Classification: Pest & Vermin Control<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12SE<br>(W) | 177 | - | 386512<br>396912 |
| 109 | **Contemporary Trade Directory Entries**<br>Name: Advance Autos Ltd<br>Location: Unit 9a,Vaughan Ind Est,Vaughan Street, Manchester, Lancashire, M12 5DU<br>Classification: Garage Services<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A13NW<br>(NW) | 179 | - | 386716<br>397202 |
| 110 | **Contemporary Trade Directory Entries**<br>Name: Marco Reas<br>Location: Ambrose St, Manchester, Lancashire, M12 5DD<br>Classification: Ice Cream Manufacturers & Suppliers<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned within the geographical locality | A14NW<br>(E) | 182 | - | 387251<br>397128 |
| 110 | **Contemporary Trade Directory Entries**<br>Name: Car Batteries Direct<br>Location: Unit 1,Ambrose St, Manchester, Lancashire, M12 5DD<br>Classification: Battery Manufacturers & Supplies<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned within the geographical locality | A14NW<br>(E) | 182 | - | 387251<br>397128 |
| 111 | **Contemporary Trade Directory Entries**<br>Name: Popular Uk Tyre<br>Location: Unit 1-3, Ambrose House, Ambrose Street, Manchester, M12 5DD<br>Classification: Tyre Dealers<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A14NW<br>(NE) | 187 | - | 387235<br>397189 |
| 111 | **Contemporary Trade Directory Entries**<br>Name: Implex Traders<br>Location: Unit 6, Ambrose House, Ambrose Street, Manchester, M12 5DD<br>Classification: Blinds, Awnings & Canopies<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14NW<br>(NE) | 220 | - | 387259<br>397214 |
| 112 | **Contemporary Trade Directory Entries**<br>Name: East Manchester Motor Services<br>Location: Conway House,Clowes St, Manchester, Lancashire, M12 5JE<br>Classification: Garage Services<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A13SW<br>(SW) | 193 | - | 386569<br>396725 |
| 113 | **Contemporary Trade Directory Entries**<br>Name: Tdx Ltd<br>Location: Gorton Road, Manchester, M11 2DZ<br>Classification: Salvage Dealers<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A13NW<br>(N) | 211 | - | 386789<br>397312 |
| 114 | **Contemporary Trade Directory Entries**<br>Name: B L G Auto Salvage<br>Location: 21, Textile Street, Manchester, Lancashire, M12 5DJ<br>Classification: Car Breakdown & Recovery Services<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14NW<br>(E) | 242 | - | 387325<br>397094 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 115 | **Contemporary Trade Directory Entries**<br>Name: C G B Services Ltd<br>Location: Unit 2, Britannia House, Gorton Road, MANCHESTER, M11 2DA<br>Classification: Engineers - General<br>**Status: Active**<br>Positional Accuracy: Manually positioned to the road within the address or location | A18SW<br>(N) | 244 | - | 386776<br>397342 |
| 116 | **Contemporary Trade Directory Entries**<br>Name: F W Singleton Ltd<br>Location: 4, Wolverton Street, Manchester, M11 2ET<br>Classification: Scrap Metal Merchants<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A18SE<br>(N) | 269 | - | 386913<br>397405 |
| 117 | **Contemporary Trade Directory Entries**<br>Name: B O C Cars<br>Location: 308, Hyde Road, Manchester, M12 4RA<br>Classification: Car Dealers - Used<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7NE<br>(SW) | 289 | - | 386508<br>396649 |
| 117 | **Contemporary Trade Directory Entries**<br>Name: Fuji Car Sales<br>Location: 308, Hyde Road, Manchester, M12 4RA<br>Classification: Car Dealers - Used<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A7NE<br>(SW) | 289 | - | 386508<br>396649 |
| 117 | **Contemporary Trade Directory Entries**<br>Name: Www.Welovemotors.Com<br>Location: 308, Hyde Road, Manchester, M12 4RA<br>Classification: Car Dealers - Used<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A7NE<br>(SW) | 289 | - | 386508<br>396649 |
| 117 | **Contemporary Trade Directory Entries**<br>Name: Brent Taylor Car Sales<br>Location: 308, Hyde Road, Manchester, M12 4RA<br>Classification: Car Dealers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7NE<br>(SW) | 289 | - | 386508<br>396649 |
| 117 | **Contemporary Trade Directory Entries**<br>Name: Andrew Morrey<br>Location: 308, Hyde Road, Manchester, M12 4RA<br>Classification: Car Dealers - Used<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7NE<br>(SW) | 289 | - | 386508<br>396649 |
| 117 | **Contemporary Trade Directory Entries**<br>Name: Winsford Car Sales<br>Location: 308, Hyde Road, Manchester, M12 4RA<br>Classification: Car Dealers - Used<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7NE<br>(SW) | 289 | - | 386508<br>396649 |
| 117 | **Contemporary Trade Directory Entries**<br>Name: Andrew Morrey<br>Location: 308, Hyde Road, Manchester, M12 4RA<br>Classification: Car Dealers - Used<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A7NE<br>(SW) | 289 | - | 386508<br>396649 |
| 117 | **Contemporary Trade Directory Entries**<br>Name: Delta Direct Cars<br>Location: 308, Hyde Road, Manchester, M12 4RA<br>Classification: Car Dealers - Used<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A7NE<br>(SW) | 289 | - | 386508<br>396649 |
| 117 | **Contemporary Trade Directory Entries**<br>Name: Phoenix Vehicle Resales<br>Location: 308, Hyde Road, Manchester, M12 4RA<br>Classification: Car Dealers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A7NE<br>(SW) | 289 | - | 386508<br>396649 |
| 117 | **Contemporary Trade Directory Entries**<br>Name: Regal Motors<br>Location: 308, Hyde Road, Manchester, M12 4RA<br>Classification: Car Dealers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7NE<br>(SW) | 289 | - | 386508<br>396649 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 117 | **Contemporary Trade Directory Entries**<br>Name: A & A<br>Location: 308, Hyde Road, Manchester, Lancashire, M12 4RA<br>Classification: Car Dealers - Used<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7NE<br>(SW) | 289 | - | 386508<br>396649 |
| 118 | **Contemporary Trade Directory Entries**<br>Name: Armstrong Fluid Technology<br>Location: Wolverton Street, Manchester, Greater Manchester, M11 2ET<br>Classification: Machinery - Industrial & Commercial<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned within the geographical locality | A18SE<br>(N) | 295 | - | 386976<br>397435 |
| 119 | **Contemporary Trade Directory Entries**<br>Name: Auto Spares<br>Location: Bennett St, Manchester, M12 5AQ<br>Classification: Car Dealers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A12SE<br>(W) | 305 | - | 386370<br>396965 |
| 119 | **Contemporary Trade Directory Entries**<br>Name: Denholm Transport<br>Location: Olympic Freight Terminal, Bennett Street, Manchester, Greater Manchester, M12 5NL<br>Classification: Freight Forwarders<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned to the road within the address or location | A12SE<br>(W) | 345 | - | 386332<br>396952 |
| 120 | **Contemporary Trade Directory Entries**<br>Name: Tube Tech Solutions Uk Ltd<br>Location: Unit 3 Kay Street, Manchester, Greater Manchester, M11 2DU<br>Classification: Metal Products - Fabricated<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned to the address or location | A18SW<br>(N) | 308 | - | 386879<br>397442 |
| 121 | **Contemporary Trade Directory Entries**<br>Name: Cheadle 24hr Breakdown/Recovery Serv<br>Location: Culand Street, Manchester, Lancashire, m12 4dd<br>Classification: Car Breakdown & Recovery Services<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned within the geographical locality | A12SE<br>(SW) | 332 | - | 386436<br>396670 |
| 121 | **Contemporary Trade Directory Entries**<br>Name: P P M Auto Care<br>Location: Culand Street, Manchester, M12 4DD<br>Classification: Car Body Repairs<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12SE<br>(SW) | 332 | - | 386436<br>396670 |
| 122 | **Contemporary Trade Directory Entries**<br>Name: J Allcock & Sons Ltd<br>Location: Textile Street, MANCHESTER, M12 5DL<br>Classification: Rubber & Plastic Products - Manufacturers<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A14NW<br>(E) | 333 | - | 387427<br>397074 |
| 123 | **Contemporary Trade Directory Entries**<br>Name: Bin & Gone<br>Location: 3, Apollo Walk, Manchester, M12 5HG<br>Classification: Waste Disposal Services<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14SW<br>(SE) | 333 | - | 387343<br>396731 |
| 124 | **Contemporary Trade Directory Entries**<br>Name: Hyde Road Wheels<br>Location: 270 Hyde Rd, Manchester, Lancashire, M12 5FH<br>Classification: Garage Services<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned to the address or location | A12SE<br>(SW) | 341 | - | 386401<br>396715 |
| 124 | **Contemporary Trade Directory Entries**<br>Name: Hyde Road Tyre Co<br>Location: 268, Hyde Road, Manchester, M12 5FH<br>Classification: Tyre Dealers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12SE<br>(SW) | 375 | - | 386367<br>396708 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 124 | **Contemporary Trade Directory Entries**<br>Name: Hyde Road Wheels<br>Location: 268, Hyde Road, Manchester, Lancashire, M12 5FH<br>Classification: Tyre Dealers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12SE<br>(SW) | 375 | - | 386367<br>396708 |
| 124 | **Contemporary Trade Directory Entries**<br>Name: Cheshire Case Ltd<br>Location: Coverdale Cres, Manchester, M12 4AP<br>Classification: Boxes & Cartons<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A12SE<br>(SW) | 420 | - | 386329<br>396682 |
| 124 | **Contemporary Trade Directory Entries**<br>Name: Britannia Knitwear<br>Location: Unit 1-6, Viva Centre, Coverdale Crescent, Manchester, M12 4AP<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A12SE<br>(SW) | 420 | - | 386329<br>396682 |
| 125 | **Contemporary Trade Directory Entries**<br>Name: Brayziers Architectural Services<br>Location: 1 Kay St, Manchester, Lancashire, M11 2DX<br>Classification: Staircase, Balustrade & Handrail Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A18SW<br>(N) | 342 | - | 386778<br>397453 |
| 125 | **Contemporary Trade Directory Entries**<br>Name: Pride Autos<br>Location: Kay St, Manchester, M11 2DU<br>Classification: Garage Services<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A18SW<br>(N) | 363 | - | 386804<br>397484 |
| 125 | **Contemporary Trade Directory Entries**<br>Name: C & A Autos<br>Location: Burlington Works,411 Kay St, Manchester, Lancashire, M11 2DU<br>Classification: Tyre Dealers<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A18SW<br>(N) | 371 | - | 386784<br>397486 |
| 125 | **Contemporary Trade Directory Entries**<br>Name: Deansgate Press Ltd<br>Location: Burlington Works, Kay Street, Manchester, M11 2DU<br>Classification: Printers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned in the proximity of the address | A18SW<br>(N) | 375 | - | 386776<br>397488 |
| 125 | **Contemporary Trade Directory Entries**<br>Name: Oakenwell Ltd<br>Location: 414, Ashton Old Road, Manchester, M11 2DT<br>Classification: Fork Lift Trucks<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A18SW<br>(N) | 382 | - | 386813<br>397506 |
| 125 | **Contemporary Trade Directory Entries**<br>Name: Sdl Manchester Ltd<br>Location: 414, Ashton Old Road, Manchester, Lancashire, M11 2DT<br>Classification: Exhaust & Shock Absorber Centres<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A18SW<br>(N) | 382 | - | 386812<br>397506 |
| 125 | **Contemporary Trade Directory Entries**<br>Name: Specialist Skills<br>Location: 414, Ashton Old Road, Manchester, Lancashire, M11 2DT<br>Classification: Fork Lift Trucks<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A18SW<br>(N) | 382 | - | 386813<br>397506 |
| 125 | **Contemporary Trade Directory Entries**<br>Name: Sdl (Manchester)<br>Location: 414, Ashton Old Road, Manchester, Lancashire, M11 2DT<br>Classification: Exhaust System Manufacturers & Wholesalers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A18SW<br>(N) | 382 | - | 386812<br>397506 |
| 125 | **Contemporary Trade Directory Entries**<br>Name: Manchester Motor Factors Ltd<br>Location: 414, Ashton Old Road, Manchester, M11 2DT<br>Classification: Garage Services<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A18SW<br>(N) | 382 | - | 386813<br>397506 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 125 | **Contemporary Trade Directory Entries**<br>Name: Del Print Display Service Ltd<br>Location: Kay St, Manchester, M11 2DU<br>Classification: Printers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A18SW<br>(N) | 384 | - | 386754<br>397488 |
| 125 | **Contemporary Trade Directory Entries**<br>Name: Envious Lifestyle Products<br>Location: 412, Ashton Old Road, Manchester, Lancashire, M11 2DT<br>Classification: Homefurnishings - Manufacturers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A18SW<br>(N) | 393 | - | 386778<br>397508 |
| 125 | **Contemporary Trade Directory Entries**<br>Name: Print Of Manchester<br>Location: 410, Ashton Old Road, Manchester, M11 2DT<br>Classification: T-Shirts<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A18SW<br>(N) | 417 | - | 386736<br>397516 |
| 126 | **Contemporary Trade Directory Entries**<br>Name: Claymore Motors<br>Location: 384 Hyde Rd, Manchester, Lancashire, M12 4SB<br>Classification: Car Dealers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A8NW<br>(S) | 357 | - | 386870<br>396520 |
| 127 | **Contemporary Trade Directory Entries**<br>Name: Temple Mot Centre<br>Location: 8, Tuley Street, Manchester, M11 2DY<br>Classification: Mot Testing Centres<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A18SW<br>(N) | 360 | - | 386710<br>397438 |
| 127 | **Contemporary Trade Directory Entries**<br>Name: Boss Direct<br>Location: Tuley Street, Manchester, Lancashire, M11 2DY<br>Classification: Printers<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned within the geographical locality | A18SW<br>(N) | 360 | - | 386710<br>397438 |
| 127 | **Contemporary Trade Directory Entries**<br>Name: Corbett Robertson & Co Ltd<br>Location: 14-18, Tuley Street, Manchester, M11 2DY<br>Classification: Car Body Repairs<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A18SW<br>(N) | 360 | - | 386710<br>397438 |
| 127 | **Contemporary Trade Directory Entries**<br>Name: Armin & Butler Ltd<br>Location: 14-18, Tuley Street, Manchester, M11 2DY<br>Classification: Printers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A18SW<br>(N) | 360 | - | 386710<br>397438 |
| 127 | **Contemporary Trade Directory Entries**<br>Name: Bgm Wire Products Ltd<br>Location: Unit 8 Tuley St, Manchester, M11 2DY<br>Classification: Wire Products - Manufacturers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A18SW<br>(N) | 360 | - | 386710<br>397438 |
| 127 | **Contemporary Trade Directory Entries**<br>Name: Ucs Manchester<br>Location: Gorton Rd, Manchester, Lancashire, M11 2DZ<br>Classification: Scrap Yards<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned within the geographical locality | A18SW<br>(NW) | 364 | - | 386692<br>397430 |
| 127 | **Contemporary Trade Directory Entries**<br>Name: Universal Car Spares<br>Location: Gorton Road, Manchester, Greater Manchester, M11 2DZ<br>Classification: Car Breakdown & Recovery Services<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned within the geographical locality | A18SW<br>(NW) | 364 | - | 386692<br>397430 |
| 128 | **Contemporary Trade Directory Entries**<br>Name: Grace International<br>Location: Bennett St, Manchester, Lancashire, M12 5NL<br>Classification: Recycling Centres<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A12SE<br>(W) | 361 | - | 386318<br>396940 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 129 | **Contemporary Trade Directory Entries**<br>Name: Frederick Law & Co Ltd<br>Location: 418 Ashton Old Rd, Manchester, Lancashire, M11 2DT<br>Classification: Printers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A18SW<br>(N) | 371 | - | 386860<br>397503 |
| 129 | **Contemporary Trade Directory Entries**<br>Name: Tyre Save Ltd<br>Location: 418, Ashton Old Road, Manchester, M11 2DT<br>Classification: Tyre Dealers<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A18SW<br>(N) | 371 | - | 386860<br>397503 |
| 130 | **Contemporary Trade Directory Entries**<br>Name: Universal Car Spares<br>Location: Gorton Rd, Manchester, Lancashire, M11 2DZ<br>Classification: Car Breakers & Dismantlers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A18SW<br>(NW) | 378 | - | 386658<br>397422 |
| 131 | **Contemporary Trade Directory Entries**<br>Name: J N J Fabrications Ltd<br>Location: 31, Ambrose Street, Manchester, M12 5DD<br>Classification: Engineers - General<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A14NW<br>(E) | 382 | - | 387446<br>397179 |
| 132 | **Contemporary Trade Directory Entries**<br>Name: C & A Autos<br>Location: 411 Kay St, Manchester, Lancashire, M11 2DU<br>Classification: Tyre Dealers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A18SW<br>(N) | 400 | - | 386724<br>397492 |
| 133 | **Contemporary Trade Directory Entries**<br>Name: Manchester Breakdown Services<br>Location: New Bank Street, Manchester, M12 4TN<br>Classification: Car Breakdown & Recovery Services<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7NE<br>(SW) | 405 | - | 386420<br>396573 |
| 133 | **Contemporary Trade Directory Entries**<br>Name: Manchester Breakdown Services<br>Location: The Compound, New Bank Street, Manchester, M12 4TN<br>Classification: Breakdown and Recovery<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A7NE<br>(SW) | 414 | - | 386417<br>396564 |
| 133 | **Contemporary Trade Directory Entries**<br>Name: T Naughton Ltd<br>Location: Yard C, New Bank Street, Manchester, M12 4TN<br>Classification: Road Haulage Services<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A7NE<br>(SW) | 425 | - | 386391<br>396575 |
| 134 | **Contemporary Trade Directory Entries**<br>Name: Square Four Garage<br>Location: Redgate La, Manchester, M12 4RZ<br>Classification: Car Breakers & Dismantlers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A8NW<br>(S) | 433 | - | 386843<br>396432 |
| 135 | **Contemporary Trade Directory Entries**<br>Name: Bht Commercial Services<br>Location: 519, Hyde Road, Manchester, Lancashire, M12 5FL<br>Classification: Commercial Vehicle Bodybuilders & Repairers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A8NE<br>(SE) | 445 | - | 387162<br>396518 |
| 136 | **Contemporary Trade Directory Entries**<br>Name: Uniexpress<br>Location: Olympic House, Bennett Street, Manchester, M12 5AP<br>Classification: Cargo Handling Services<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A12SE<br>(W) | 447 | - | 386229<br>396952 |
| 136 | **Contemporary Trade Directory Entries**<br>Name: Bornholm Transport<br>Location: Olympic House, Bennett Street, Manchester, M12 5AP<br>Classification: Road Haulage Services<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12SE<br>(W) | 447 | - | 386229<br>396952 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 136 | **Contemporary Trade Directory Entries**<br>Name: Rapid Cargo Uk Ltd<br>Location: Olympic Freight Terminal, Bennett Street, Manchester, M12 5NL<br>Classification: Road Haulage Services<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A12SE<br>(W) | 447 | - | 386229<br>396952 |
| 137 | **Contemporary Trade Directory Entries**<br>Name: R & B Pet Supplies<br>Location: 20-26, Kay Street, Manchester, M11 2DU<br>Classification: Pet Foods & Animal Feeds<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A18SW<br>(N) | 461 | - | 386674<br>397534 |
| 138 | **Contemporary Trade Directory Entries**<br>Name: G & G Tyres<br>Location: Unit 4, Railway Arches, Bennett Street, Manchester, M12 5AQ<br>Classification: Tyre Dealers<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A12SE<br>(W) | 467 | - | 386234<br>396826 |
| 138 | **Contemporary Trade Directory Entries**<br>Name: Manchester Plastic<br>Location: Unit 2, Railway Arches, Bennett Street, Manchester, M12 5AQ<br>Classification: Plastics - Welding<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A12SE<br>(W) | 467 | - | 386234<br>396826 |
| 138 | **Contemporary Trade Directory Entries**<br>Name: Pro Catering Equipment<br>Location: Unit 4, Railway Arches, Bennett Street, Manchester, M12 5AQ<br>Classification: Catering Equipment<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12SE<br>(W) | 467 | - | 386234<br>396826 |
| 138 | **Contemporary Trade Directory Entries**<br>Name: Godley Fabrications<br>Location: Unit 2, Railway Arches, Bennett Street, Manchester, M12 5AQ<br>Classification: Sheet Metal Work<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12SE<br>(W) | 467 | - | 386234<br>396826 |
| 138 | **Contemporary Trade Directory Entries**<br>Name: A K Autos<br>Location: Unit 4, Railway Arches, Bennett Street, Manchester, M12 5AQ<br>Classification: Garage Services<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A12SE<br>(W) | 467 | - | 386234<br>396826 |
| 138 | **Contemporary Trade Directory Entries**<br>Name: Automove<br>Location: Unit 4, Railway Arches, Bennett Street, Manchester, M12 5AQ<br>Classification: Car Breakdown & Recovery Services<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12SE<br>(W) | 467 | - | 386234<br>396826 |
| 139 | **Contemporary Trade Directory Entries**<br>Name: Belle View Filling Station<br>Location: 545, Hyde Road, Manchester, M12 5NQ<br>Classification: Petrol Filling Stations<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A9NW<br>(SE) | 483 | - | 387258<br>396508 |
| 139 | **Contemporary Trade Directory Entries**<br>Name: Global Worldwide Enterprises<br>Location: 545, Hyde Road, Manchester, Lancashire, M12 5NQ<br>Classification: Petrol Filling Stations<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A9NW<br>(SE) | 483 | - | 387258<br>396508 |
| 139 | **Contemporary Trade Directory Entries**<br>Name: Belle Vue Filling Station<br>Location: 545, Hyde Road, Manchester, M12 5NQ<br>Classification: Petrol Filling Stations - 24 Hour<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned to the address or location | A9NW<br>(SE) | 483 | - | 387258<br>396508 |
| 140 | **Contemporary Trade Directory Entries**<br>Name: Auto Salvage<br>Location: Gorton Rd, Manchester, Lancashire, M11 2DZ<br>Classification: Breakdown and Recovery<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A18SW<br>(NW) | 483 | - | 386564<br>397488 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 141 | **Contemporary Trade Directory Entries**<br>Name: Mantec<br>Location: Unit 5, City Course Trading Estate, Whitworth Street, Openshaw, Manchester, M11 2DW<br>Classification: Precision Engineers<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A19SW<br>(NE) | 488 | - | 387413<br>397446 |
| 141 | **Contemporary Trade Directory Entries**<br>Name: Incognito Ltd<br>Location: Unit 4, City Course Trading Estate, Whitworth Street, Openshaw, Manchester, M11 2DW<br>Classification: Greeting Card Publishers & Wholesalers<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A19SW<br>(NE) | 499 | - | 387417<br>397458 |
| 141 | **Contemporary Trade Directory Entries**<br>Name: North West Compressed Air Co Ltd<br>Location: Unit 7, City Course Trading Estate, Whitworth Street, Openshaw, Manchester, M11 2DW<br>Classification: Air Compressors<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A19SW<br>(NE) | 516 | - | 387441<br>397459 |
| 142 | **Contemporary Trade Directory Entries**<br>Name: P B S I Group Ltd<br>Location: Belle Vue Works, Boundary Street, Manchester, M12 5NG<br>Classification: Electricity Generating & Distributing Equipment<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A9NW<br>(SE) | 490 | - | 387386<br>396563 |
| 143 | **Contemporary Trade Directory Entries**<br>Name: Universal<br>Location: 1-7, Gorton Road, Manchester, M11 2DZ<br>Classification: Scrap Metal Merchants<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A18SW<br>(NW) | 530 | - | 386568<br>397544 |
| 144 | **Contemporary Trade Directory Entries**<br>Name: Bligh & Daley<br>Location: 27, Blackwin Street, Manchester, M12 5LD<br>Classification: Cleaning Services - Domestic<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14SE<br>(E) | 534 | - | 387612<br>396783 |
| 145 | **Contemporary Trade Directory Entries**<br>Name: E P Industrial Services<br>Location: 2, Hartwell Close, Manchester, M11 3TW<br>Classification: Sewing Machines - Industrial<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A18SW<br>(N) | 562 | - | 386645<br>397633 |
| 146 | **Contemporary Trade Directory Entries**<br>Name: Redgate<br>Location: Redgate Lane, MANCHESTER, M12 4RY<br>Classification: Waste Disposal Services<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned to the road within the address or location | A8SE<br>(S) | 566 | - | 386916<br>396316 |
| 147 | **Contemporary Trade Directory Entries**<br>Name: A & R Cleaning Ltd<br>Location: 30, Hartwell Close, Manchester, M11 3TW<br>Classification: Cleaning Services - Domestic<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A18NW<br>(N) | 575 | - | 386714<br>397678 |
| 147 | **Contemporary Trade Directory Entries**<br>Name: A & R Cleaning Services<br>Location: 30, Hartwell Close, Manchester, M11 3TW<br>Classification: Commercial Cleaning Services<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A18NW<br>(N) | 575 | - | 386714<br>397678 |
| 148 | **Contemporary Trade Directory Entries**<br>Name: King Span Ltd<br>Location: Garland Works, Bennett Street, Manchester, M12 5BW<br>Classification: Brass & Copper Manufacturers & Suppliers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12SW<br>(W) | 601 | - | 386076<br>396935 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 148 | **Contemporary Trade Directory Entries**<br>Name: Eurobox<br>Location: Bennett Street, Manchester, M12 5AQ<br>Classification: Boxes & Cartons<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12SW<br>(W) | 601 | - | 386076<br>396935 |
| 148 | **Contemporary Trade Directory Entries**<br>Name: D B Processors Ltd<br>Location: Bennett Street, Manchester, M12 5AQ<br>Classification: Packaging & Wrapping Equipment & Supplies<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12SW<br>(W) | 601 | - | 386076<br>396935 |
| 148 | **Contemporary Trade Directory Entries**<br>Name: Fast Forward Recycling Ltd<br>Location: Bennett Street, Manchester, M12 5AQ<br>Classification: Recycling Centres<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A12SW<br>(W) | 601 | - | 386076<br>396935 |
| 148 | **Contemporary Trade Directory Entries**<br>Name: Manchester Calorifiers Ltd<br>Location: Garland Works, Bennett Street, Manchester, M12 5BW<br>Classification: Heat Exchangers<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A12SW<br>(W) | 601 | - | 386076<br>396935 |
| 148 | **Contemporary Trade Directory Entries**<br>Name: Manchester Coppersmiths<br>Location: Garland Works, Bennett Street, Manchester, M12 5BW<br>Classification: Manufacturers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12SW<br>(W) | 601 | - | 386076<br>396935 |
| 149 | **Contemporary Trade Directory Entries**<br>Name: Glyn Webb Ltd<br>Location: 641, Hyde Road, Manchester, M12 5PS<br>Classification: Wallpapers & Wall Coverings<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A9NW<br>(SE) | 614 | - | 387467<br>396469 |
| 150 | **Contemporary Trade Directory Entries**<br>Name: Howarth Metals<br>Location: Unit 22,Rondin Rd, Manchester, Lancashire, M12 6BF<br>Classification: Scrap Metal Merchants<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned to the road within the address or location | A17SW<br>(NW) | 654 | - | 386151<br>397413 |
| 151 | **Contemporary Trade Directory Entries**<br>Name: European Passenger Services Ltd<br>Location: Manchester International Depot, 255, New Bank Street, MANCHESTER, M12 4HD<br>Classification: Railway Equipment Manufacturers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A8SW<br>(S) | 659 | - | 386613<br>396198 |
| 152 | **Contemporary Trade Directory Entries**<br>Name: Orion Traders<br>Location: 491 Mill St, Manchester, Lancashire, M11 2AD<br>Classification: Leather Merchants & Wholesalers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A19NW<br>(NE) | 669 | - | 387364<br>397699 |
| 152 | **Contemporary Trade Directory Entries**<br>Name: Manchester<br>Location: Venture Centre, 491, Mill Street, Manchester, M11 2AD<br>Classification: Computer Recycling & Disposal<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A19NW<br>(NE) | 669 | - | 387365<br>397699 |
| 153 | **Contemporary Trade Directory Entries**<br>Name: Michelles Interior Textiles<br>Location: 692-694, Ashton Old Road, Manchester, M11 2ND<br>Classification: Soft Furnishings - Manufacturers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A19SE<br>(NE) | 678 | - | 387648<br>397454 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 154 | **Contemporary Trade Directory Entries**<br>Name: Furniture Recycling In Beswick<br>Location: 1 Chaddesley Walk, Manchester, Lancashire, M11 3SW<br>Classification: Recycling Centres<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A18NE<br>(N) | 709 | - | 387038<br>397846 |
| 155 | **Contemporary Trade Directory Entries**<br>Name: Kaytex<br>Location: Unit 12, Bennett Street, Manchester, M12 5AQ<br>Classification: Textile Manufacturing<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A12SW<br>(W) | 717 | - | 385955<br>396977 |
| 155 | **Contemporary Trade Directory Entries**<br>Name: Eurobox<br>Location: Unit 17 Bennett Street, Manchester, Greater Manchester, M12 5AQ<br>Classification: Packaging & Wrapping Equipment & Supplies<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned within the geographical locality | A12SW<br>(W) | 717 | - | 385955<br>396977 |
| 156 | **Contemporary Trade Directory Entries**<br>Name: A & T Pleating Co<br>Location: 221, Ashton Old Road, Manchester, M11 3WU<br>Classification: Textile Manufacturing<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A17SE<br>(NW) | 718 | - | 386268<br>397612 |
| 156 | **Contemporary Trade Directory Entries**<br>Name: Beswick Clothing Co<br>Location: 217-219, Ashton Old Road, Manchester, M11 3WU<br>Classification: Clothing & Fabrics - Manufacturers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A17SE<br>(NW) | 718 | - | 386268<br>397612 |
| 156 | **Contemporary Trade Directory Entries**<br>Name: Treads Tyres<br>Location: 223 Ashton Old Road, (Entrance On Bellen St)/, Manchester, Lancashire, M11 3WU<br>Classification: Tyre Dealers<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned to the address or location | A17SE<br>(NW) | 718 | - | 386262<br>397607 |
| 157 | **Contemporary Trade Directory Entries**<br>Name: D C Cook Direct Ltd<br>Location: 1, Rondin Road, MANCHESTER, M12 6LL<br>Classification: Car Dealers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A17SW<br>(NW) | 721 | - | 386175<br>397541 |
| 157 | **Contemporary Trade Directory Entries**<br>Name: Motor Options<br>Location: 1, Rondin Road, Manchester, M12 6LL<br>Classification: Car Dealers - Used<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A17SW<br>(NW) | 721 | - | 386175<br>397541 |
| 158 | **Contemporary Trade Directory Entries**<br>Name: Openshaw Tyres<br>Location: 745-753, Ashton Old Road, Manchester, M11 2HB<br>Classification: Tyre Dealers<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A19SE<br>(NE) | 734 | - | 387680<br>397507 |
| 159 | **Contemporary Trade Directory Entries**<br>Name: G Morris Ltd<br>Location: Gorton Lane, Manchester, M18 8BT<br>Classification: Road Haulage Services<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14SE<br>(E) | 736 | - | 387834<br>396832 |
| 160 | **Contemporary Trade Directory Entries**<br>Name: Manchester Paperbox Ltd<br>Location: Unit B5, The Dresser Centre, Whitworth Street, Openshaw, Manchester, M11 2NE<br>Classification: Boxes & Cartons<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14NE<br>(E) | 743 | - | 387782<br>397314 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 160 | **Contemporary Trade Directory Entries**<br>Name: Malacrino Mantels<br>Location: Unit B6, The Dresser Centre, Whitworth Street, Openshaw, Manchester, M11 2NE<br>Classification: Fireplaces & Mantelpieces<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A14NE<br>(E) | 743 | - | 387782<br>397314 |
| 161 | **Contemporary Trade Directory Entries**<br>Name: Sinclair Autos<br>Location: 116a, South Street, Longsight, Manchester, M12 4DT<br>Classification: Garage Services<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7SE<br>(SW) | 758 | - | 386337<br>396193 |
| 161 | **Contemporary Trade Directory Entries**<br>Name: Manchester Autoz<br>Location: Stockport Rd, Manchester, Lancashire, M13 0LF<br>Classification: Car Dealers - Used<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned within the geographical locality | A7SE<br>(SW) | 781 | - | 386354<br>396158 |
| 161 | **Contemporary Trade Directory Entries**<br>Name: Brantingham Motor Co<br>Location: 351, Stockport Road, Manchester, M13 0LF<br>Classification: Commercial Vehicle Dealers<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A7SE<br>(SW) | 781 | - | 386354<br>396158 |
| 161 | **Contemporary Trade Directory Entries**<br>Name: Jac Motors Ltd<br>Location: 351, Stockport Road, Manchester, M13 0LF<br>Classification: Car Dealers - Used<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7SE<br>(SW) | 781 | - | 386354<br>396158 |
| 161 | **Contemporary Trade Directory Entries**<br>Name: S A Autos<br>Location: 351, Stockport Road, Manchester, Lancashire, M13 0LF<br>Classification: Mot Testing Centres<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A7SE<br>(SW) | 781 | - | 386354<br>396158 |
| 161 | **Contemporary Trade Directory Entries**<br>Name: Manchester Auto Mall<br>Location: 351, Stockport Road, Manchester, Lancashire, M13 0LF<br>Classification: Car Dealers - Used<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A7SE<br>(SW) | 781 | - | 386354<br>396158 |
| 162 | **Contemporary Trade Directory Entries**<br>Name: A & R Boilers<br>Location: Unit 9 Medlock Court, Welcomb Street, Manchester, Lancashire, M11 2NB<br>Classification: Boilers - Servicing, Replacements & Repairs<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned within the geographical locality | A14NE<br>(E) | 760 | - | 387822<br>397240 |
| 162 | **Contemporary Trade Directory Entries**<br>Name: A J Ltd<br>Location: 5, Welcomb Street, Manchester, Lancashire, M11 2NB<br>Classification: Engineering Services<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A14NE<br>(E) | 760 | - | 387822<br>397240 |
| 163 | **Contemporary Trade Directory Entries**<br>Name: Van Parts<br>Location: 4 Wilson St, Openshaw, Manchester, Lancashire, M11 2AZ<br>Classification: Car Breakers & Dismantlers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A19NW<br>(NE) | 776 | - | 387380<br>397810 |
| 164 | **Contemporary Trade Directory Entries**<br>Name: Alloys Direct Ltd<br>Location: Unit 3, Daisy Mill Yard, 345, Stockport Road, Manchester, M13 0LF<br>Classification: Tyre Dealers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7SE<br>(SW) | 792 | - | 386283<br>396187 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 164 | **Contemporary Trade Directory Entries**<br>Name: Premier Code Ltd<br>Location: Unit 5, Daisy Mill Yard, 345, Stockport Road, Manchester, M13 0LF<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7SE<br>(SW) | 792 | - | 386283<br>396187 |
| 164 | **Contemporary Trade Directory Entries**<br>Name: R & Q Ltd<br>Location: 345, Stockport Road, MANCHESTER, M13 0LF<br>Classification: Clothing & Fabrics - Manufacturers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7SE<br>(SW) | 792 | - | 386283<br>396187 |
| 164 | **Contemporary Trade Directory Entries**<br>Name: David Conrad International Ltd<br>Location: Daisy Works, 345, Stockport Road, Manchester, Lancashire, M13 0LF<br>Classification: Leather Merchants & Wholesalers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7SE<br>(SW) | 792 | - | 386283<br>396187 |
| 165 | **Contemporary Trade Directory Entries**<br>Name: Mgm Motors (Manchester) Ltd<br>Location: 139, Ashton Old Road, Manchester, M12 6LE<br>Classification: Garage Services<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A17SW<br>(NW) | 793 | - | 386158<br>397623 |
| 165 | **Contemporary Trade Directory Entries**<br>Name: M G M Motors Ltd<br>Location: 139, Ashton Old Road, Manchester, M12 6LE<br>Classification: Mot Testing Centres<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A17SW<br>(NW) | 793 | - | 386158<br>397623 |
| 166 | **Contemporary Trade Directory Entries**<br>Name: G T M Europe Ltd<br>Location: 2, Universal Square, Devonshire Street North, Manchester, Lancashire, M12 6JH<br>Classification: Textile Manufacturing<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned to the address or location | A11NE<br>(W) | 806 | - | 385874<br>397132 |
| 167 | **Contemporary Trade Directory Entries**<br>Name: Delta Containers (Manchester) Ltd<br>Location: Preston Street, Manchester, M18 8DB<br>Classification: Tank Cleaning & Repairing<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A15NW<br>(E) | 819 | - | 387929<br>396995 |
| 167 | **Contemporary Trade Directory Entries**<br>Name: Universal Pallet Services Ltd<br>Location: Preston Street, Manchester, M18 8DB<br>Classification: Pallets, Crates & Packing Cases<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A15SW<br>(E) | 834 | - | 387945<br>396974 |
| 167 | **Contemporary Trade Directory Entries**<br>Name: Bag Magic Uk Ltd<br>Location: Unit 1,Excel Centre,Preston Street, Gorton, Manchester, Lancashire, M18 8DB<br>Classification: Polythene & Plastic Sheeting Supplies<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned within the geographical locality | A15SW<br>(E) | 834 | - | 387945<br>396974 |
| 168 | **Contemporary Trade Directory Entries**<br>Name: Vw Breakers<br>Location: 48, Ashton Old Road, Manchester, Lancashire, M12 6LP<br>Classification: Car Breakers & Dismantlers<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A17SW<br>(NW) | 819 | - | 386063<br>397567 |
| 168 | **Contemporary Trade Directory Entries**<br>Name: 786 Autos<br>Location: 48, Ashton Old Road, Manchester, Lancashire, M12 6LP<br>Classification: Garage Services<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A17SW<br>(NW) | 819 | - | 386063<br>397567 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 169 | **Contemporary Trade Directory Entries**<br>Name: Trade Centre<br>Location: Arch 8, Blind Lane, Manchester, Greater Manchester, M12 6JT<br>Classification: Mot Testing Centres<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned within the geographical locality | A12NW<br>(W) | 830 | - | 385886<br>397288 |
| 170 | **Contemporary Trade Directory Entries**<br>Name: Chief<br>Location: Unit 9, Medlock Court, Welcomb Street, Manchester, Lancashire, M11 2NB<br>Classification: Boilers - Servicing, Replacements & Repairs<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A14NE<br>(E) | 831 | - | 387888<br>397265 |
| 170 | **Contemporary Trade Directory Entries**<br>Name: Trade Watches<br>Location: Medlock Court,10 Welcomb St, Manchester, Lancashire, M11 2NB<br>Classification: Clocks & Watches - Manufacturers & Wholesalers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A14NE<br>(E) | 833 | - | 387888<br>397274 |
| 170 | **Contemporary Trade Directory Entries**<br>Name: Trade Watches<br>Location: unit10,Medlock Court,Welcomb St, Manchester, Lancashire, M11 2NB<br>Classification: Clocks & Watches - Manufacturers & Wholesalers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A14NE<br>(E) | 833 | - | 387888<br>397274 |
| 171 | **Contemporary Trade Directory Entries**<br>Name: W & S Mcewen<br>Location: Stockport Rd, Manchester, M13 0LF<br>Classification: Engineers - General<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A7SE<br>(SW) | 836 | - | 386238<br>396164 |
| 171 | **Contemporary Trade Directory Entries**<br>Name: Car Campus<br>Location: Stockport Rd, Manchester, Lancashire, M13 0LF<br>Classification: Car Dealers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A7SE<br>(SW) | 841 | - | 386266<br>396139 |
| 172 | **Contemporary Trade Directory Entries**<br>Name: Nazirs Ltd<br>Location: 324-328, Stockport Road, Manchester, M13 0LE<br>Classification: Food Products - Manufacturers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7SW<br>(SW) | 841 | - | 386146<br>396232 |
| 173 | **Contemporary Trade Directory Entries**<br>Name: Bradite Paints Ltd<br>Location: Wood St, Openshaw, Manchester, Lancashire, M11 2FB<br>Classification: Paint Manufacturers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A19SE<br>(NE) | 845 | - | 387836<br>397459 |
| 173 | **Contemporary Trade Directory Entries**<br>Name: Xt Technology<br>Location: 833 Ashton Old Rd, Manchester, M11 2NL<br>Classification: Wire Products - Manufacturers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A19SE<br>(NE) | 873 | - | 387872<br>397446 |
| 174 | **Contemporary Trade Directory Entries**<br>Name: Manchester Tyre Services Ltd<br>Location: Unit 2, Wilson Street, Openshaw, Manchester, M11 2AZ<br>Classification: Tyre Dealers<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A19NW<br>(NE) | 846 | - | 387562<br>397787 |
| 174 | **Contemporary Trade Directory Entries**<br>Name: Van Parts<br>Location: Wilson Street, Openshaw, Manchester, M11 2AZ<br>Classification: Commercial Vehicle Servicing, Repairs, Parts & Accessories<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A19NW<br>(NE) | 846 | - | 387562<br>397787 |
| 175 | **Contemporary Trade Directory Entries**<br>Name: The Little Greene Paint Co<br>Location: 3 Wood St, Openshaw, Manchester, Lancashire, M11 2FB<br>Classification: Paint Manufacturers<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned to the road within the address or location | A19SE<br>(NE) | 852 | - | 387838<br>397470 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 175 | **Contemporary Trade Directory Entries**<br>Name: Allstar Transport (Heathrow) Ltd<br>Location: Unit C, Wood Street, Openshaw, Manchester, M11 2FB<br>Classification: Road Haulage Services<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned in the proximity of the address | A19SE<br>(NE) | 884 | - | 387852<br>397513 |
| 176 | **Contemporary Trade Directory Entries**<br>Name: S & M<br>Location: Aria House, 2 Belle Vue Avenue, Manchester, Greater Manchester, M12 4AS<br>Classification: Meat - Wholesale<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned within the geographical locality | A8SE<br>(S) | 863 | - | 386950<br>396016 |
| 177 | **Contemporary Trade Directory Entries**<br>Name: S T Garage<br>Location: 6b Linnett Clo, Manchester, M12 4EZ<br>Classification: Garage Services<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A8SW<br>(S) | 873 | - | 386566<br>395989 |
| 177 | **Contemporary Trade Directory Entries**<br>Name: S T Garage<br>Location: 6b, Linnett Close, Manchester, M12 4EZ<br>Classification: Car Paint & Lacquer Manufacturers & Suppliers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A3NW<br>(S) | 906 | - | 386586<br>395952 |
| 177 | **Contemporary Trade Directory Entries**<br>Name: Prime Doors Ltd<br>Location: Unit 2, Longsight Industrial Estate, Newton Avenue, Longsight, MANCHESTER, M12 4EY<br>Classification: Builders' Merchants<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A3NW<br>(S) | 906 | - | 386586<br>395952 |
| 177 | **Contemporary Trade Directory Entries**<br>Name: North West Linen & Towel Services Ltd<br>Location: Unit 2, Longsight Industrial Estate, Newton Avenue, Longsight, Manchester, M12 4EY<br>Classification: Laundries & Launderettes<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A3NW<br>(S) | 906 | - | 386586<br>395952 |
| 177 | **Contemporary Trade Directory Entries**<br>Name: Uk Tyres<br>Location: Unit 4, Longsight Industrial Estate, Newton Avenue, Longsight, Manchester, M12 4EY<br>Classification: Tyre Dealers<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A3NW<br>(S) | 906 | - | 386586<br>395952 |
| 177 | **Contemporary Trade Directory Entries**<br>Name: Q E D<br>Location: Unit 6A, Longsight Industrial Estate, Newton Avenue, Longsight, Manchester, M12 4EY<br>Classification: Exhaust & Shock Absorber Centres<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A3NW<br>(S) | 906 | - | 386586<br>395952 |
| 177 | **Contemporary Trade Directory Entries**<br>Name: M & T Motors<br>Location: Unit 4, Longsight Industrial Estate, Newton Avenue, Longsight, Manchester, M12 4EY<br>Classification: Garage Services<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A3NW<br>(S) | 906 | - | 386586<br>395952 |
| 177 | **Contemporary Trade Directory Entries**<br>Name: Joseph H Wood & Son<br>Location: Unit 2, Longsight Industrial Estate, Newton Avenue, Longsight, Manchester, M12 4EY<br>Classification: Boilers - Servicing, Replacements & Repairs<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A3NW<br>(S) | 906 | - | 386586<br>395952 |
| 177 | **Contemporary Trade Directory Entries**<br>Name: G B Autos<br>Location: Unit 10, Longsight Industrial Estate, Newton Avenue, Longsight, Manchester, Lancashire, M12 4EY<br>Classification: Garage Services<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A3NW<br>(S) | 906 | - | 386586<br>395952 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 177 | **Contemporary Trade Directory Entries**<br>Name: M H A Motors<br>Location: Unit 2, Longsight Industrial Estate, Newton Avenue, Longsight, Manchester, M12 4EY<br>Classification: Car Body Repairs<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A3NW<br>(S) | 906 | - | 386586<br>395952 |
| 177 | **Contemporary Trade Directory Entries**<br>Name: Decas Motors<br>Location: Unit 5, Longsight Industrial Estate, Newton Avenue, Longsight, Manchester, Lancashire, M12 4EY<br>Classification: Garage Services<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A3NW<br>(S) | 906 | - | 386586<br>395952 |
| 177 | **Contemporary Trade Directory Entries**<br>Name: Gb Autos<br>Location: Unit 10, Longsight Industrial Estate, Newton Avenue, Longsight, Manchester, Lancashire, M12 4EY<br>Classification: Garage Services<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A3NW<br>(S) | 906 | - | 386586<br>395952 |
| 177 | **Contemporary Trade Directory Entries**<br>Name: Longside Motor Body Repair Centre<br>Location: Unit 6a, Longsight Industrial Estate, Newton Avenue, Longsight, Manchester, Lancashire, M12 4EY<br>Classification: Car Body Repairs<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A3NW<br>(S) | 906 | - | 386586<br>395952 |
| 177 | **Contemporary Trade Directory Entries**<br>Name: Kwik Autos<br>Location: Unit 6b, Longsight Industrial Estate, Newton Avenue, Longsight, Manchester, M12 4EY<br>Classification: Mot Testing Centres<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A3NW<br>(S) | 906 | - | 386586<br>395952 |
| 177 | **Contemporary Trade Directory Entries**<br>Name: M H A Motors<br>Location: Unit C, Longsight Industrial Estate, Newton Avenue, Longsight, Manchester, M12 4EY<br>Classification: Garage Services<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A3NW<br>(S) | 906 | - | 386586<br>395952 |
| 177 | **Contemporary Trade Directory Entries**<br>Name: United Autos Repairs Ltd<br>Location: Unit 6a, Longsight Industrial Estate, Newton Avenue, Longsight, Manchester, M12 4EY<br>Classification: Garage Services<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A3NW<br>(S) | 906 | - | 386586<br>395952 |
| 177 | **Contemporary Trade Directory Entries**<br>Name: M & Auto Salvage<br>Location: Unit 5A,Longsight Ind Est,Newton Av, Longsight, Manchester, Lancashire, M12 4EY<br>Classification: Garage Services<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned within the geographical locality | A2NE<br>(S) | 914 | - | 386552<br>395950 |
| 178 | **Contemporary Trade Directory Entries**<br>Name: Lafarge Tarmac<br>Location: Bessemer Street, Manchester, M11 2NP<br>Classification: Asphalt & Macadam Suppliers<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A15NW<br>(E) | 877 | - | 387980<br>397081 |
| 178 | **Contemporary Trade Directory Entries**<br>Name: Lafarge Readymix<br>Location: Bessemer Street, Manchester, M11 2NP<br>Classification: Concrete & Mortar Ready Mixed<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A15NW<br>(E) | 877 | - | 387980<br>397081 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 179 | **Contemporary Trade Directory Entries**<br>Name: A S T Express Ltd<br>Location: Preston Street, MANCHESTER, M18 8DB<br>Classification: Road Haulage Services<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A15NW<br>(E) | 879 | - | 387989<br>396994 |
| 180 | **Contemporary Trade Directory Entries**<br>Name: Sandypress Ltd<br>Location: 2, Handsworth Street, Manchester, M12 6LH<br>Classification: Printers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A16SE<br>(W) | 882 | - | 385870<br>397385 |
| 180 | **Contemporary Trade Directory Entries**<br>Name: Simoco International Service Centre<br>Location: Pittbrook St, Manchester, M12 6LR<br>Classification: Radio Communication Equipment<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A16SE<br>(W) | 898 | - | 385843<br>397366 |
| 181 | **Contemporary Trade Directory Entries**<br>Name: Paperdisposables.Com<br>Location: 40-46, Ashton Old Road, Manchester, M12 6LP<br>Classification: Cleaning Materials & Equipment<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A17SW<br>(NW) | 884 | - | 385994<br>397585 |
| 181 | **Contemporary Trade Directory Entries**<br>Name: Loop Express Ltd<br>Location: 40-46, Ashton Old Road, Manchester, M12 6LP<br>Classification: Airfreight Services<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A17SW<br>(NW) | 884 | - | 385994<br>397585 |
| 181 | **Contemporary Trade Directory Entries**<br>Name: Printer Wizard<br>Location: 40 Ashton Old Road, Manchester, Lancashire, M12 6LP<br>Classification: Office Equipment Servicing & Maintenance<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned within the geographical locality | A17SW<br>(NW) | 884 | - | 385994<br>397585 |
| 181 | **Contemporary Trade Directory Entries**<br>Name: Ashbury Service Station<br>Location: Ashton Old Road, Manchester, M11 3LW<br>Classification: Mot Testing Centres<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A17SW<br>(NW) | 894 | - | 385985<br>397590 |
| 181 | **Contemporary Trade Directory Entries**<br>Name: O T R Group<br>Location: 38, Ashton Old Road, MANCHESTER, M12 6LP<br>Classification: Car Customisation & Conversion Specialists<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A17SW<br>(NW) | 903 | - | 385976<br>397594 |
| 182 | **Contemporary Trade Directory Entries**<br>Name: S A Smith (Manchester) Ltd<br>Location: 16-18, Midland Street, Manchester, M12 6LB<br>Classification: Sewing Machines - Industrial<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A17SW<br>(NW) | 887 | - | 385931<br>397506 |
| 182 | **Contemporary Trade Directory Entries**<br>Name: Mitton & Holden Ltd<br>Location: Corporate House, 12-14, Midland Street, Manchester, M12 6LB<br>Classification: Clothing & Fabrics - Manufacturers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A17SW<br>(NW) | 919 | - | 385895<br>397510 |
| 182 | **Contemporary Trade Directory Entries**<br>Name: B H T Commercials Ltd<br>Location: Unit 1 Midland Street, Manchester, Greater Manchester, M12 6LB<br>Classification: Commercial Vehicle Breakdown & Recovery Services<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned within the geographical locality | A16SE<br>(NW) | 922 | - | 385874<br>397481 |
| 182 | **Contemporary Trade Directory Entries**<br>Name: Kitchen Uber<br>Location: 5 Midland St, Manchester, Lancashire, M12 6LB<br>Classification: Kitchen Furniture Manufacturers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A16SE<br>(NW) | 958 | - | 385868<br>397539 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 183 | **Contemporary Trade Directory Entries**<br>Name: Mancab Uk Ltd<br>Location: 125 Clayton Lane, Manchester, Lancashire, M11 4SX<br>Classification: Garage Services<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A19NE<br>(NE) | 910 | - | 387632<br>397815 |
| 184 | **Contemporary Trade Directory Entries**<br>Name: Mega Motor Care<br>Location: Unit 5,Wilson St, Openshaw, Manchester, Lancashire, M11 2AZ<br>Classification: Garage Services<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A19NW<br>(NE) | 917 | - | 387562<br>397872 |
| 184 | **Contemporary Trade Directory Entries**<br>Name: Aswr Bmw Dismantlers<br>Location: Unit 1,Wilson St, Openshaw, Manchester, Lancashire, M11 2AZ<br>Classification: Car Breakers & Dismantlers<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A19NW<br>(NE) | 919 | - | 387565<br>397873 |
| 185 | **Contemporary Trade Directory Entries**<br>Name: Uk & North Enterprises Ltd<br>Location: Gorton La, Manchester, M18 8DA<br>Classification: Bus & Coach Operators & Stations<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A15SW<br>(E) | 922 | - | 388012<br>396773 |
| 186 | **Contemporary Trade Directory Entries**<br>Name: Best Tyres Fit<br>Location: 298a, New Bank Street, Manchester, M12 4HW<br>Classification: Tyre Dealers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A3NW<br>(S) | 923 | - | 386709<br>395925 |
| 187 | **Contemporary Trade Directory Entries**<br>Name: Al-Murad<br>Location: 839, Ashton Old Road, Manchester, M11 2NL<br>Classification: Wallpapers & Wall Coverings<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A20SW<br>(NE) | 928 | - | 387924<br>397465 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: Highstreet Knitwear<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, M12 6JR<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: A.S Knitwear<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, M12 6JR<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: A J Hayhurst Ltd<br>Location: Majid House 37-49, Devonshire Street North, Manchester, Lancashire, M12 6JR<br>Classification: Knitting Yarn Manufacturers & Wholesalers<br>**Status: Active**<br>Positional Accuracy: Manually positioned within the geographical locality | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: Y & M Knitwear Ltd<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, M12 6JR<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: T N S Knitwear Ltd<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, M12 6JR<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11NE<br>(W) | 938 | - | 385748<br>397185 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 188 | **Contemporary Trade Directory Entries**<br>Name: Mystique Knitwear Ltd<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, M12 6JR<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: Radical Knitwear Ltd<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, Lancashire, M12 6JR<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: Alpha Knitwear Ltd<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, Lancashire, M12 6JR<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: Danaco International Ltd<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, Lancashire, M12 6JR<br>Classification: Manufacturers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: Alesha Knit Ltd<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, Lancashire, M12 6JR<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: Raz Knitwear<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, Lancashire, M12 6JR<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: B S M Knitware<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, Lancashire, M12 6JR<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: The Five Star Knitwear (Uk) Ltd<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, Lancashire, M12 6JR<br>Classification: Clothing & Fabrics - Manufacturers<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: M & R Knitwear<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, Lancashire, M12 6JR<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: M & R Knitwear<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, Lancashire, M12 6JR<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11NE<br>(W) | 938 | - | 385748<br>397185 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 188 | **Contemporary Trade Directory Entries**<br>Name: A N Knitwear<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, Lancashire, M12 6JR<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: Raz Knitwear<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, M12 6JR<br>Classification: Knitting Yarn Manufacturers & Wholesalers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: Smart Knitwear<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, M12 6JR<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: Newcamp Ltd<br>Location: Unit 7 First Floor Majid House, 39-47 Devonshire Street Nort, Manchester, Greater Manchester, M12 6JR<br>Classification: Clothing Accessory Manufacturers<br>**Status: Active**<br>Positional Accuracy: Manually positioned within the geographical locality | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: Klarion Ltd<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, M12 6JR<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: Sunrise Knitwear Ltd<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, Lancashire, M12 6JR<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: Jantone<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, M12 6JR<br>Classification: Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: Flexball<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, M12 6JR<br>Classification: Clothing & Fabrics - Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: K D<br>Location: Majid House, 37-49, Devonshire Street North, Manchester, M12 6JR<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A11NE<br>(W) | 938 | - | 385748<br>397185 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: Sweater Manufacturing Co Ltd<br>Location: 132-134, Higher Ardwick, Manchester, M12 6DA<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11NE<br>(W) | 957 | - | 385725<br>397164 |
| 188 | **Contemporary Trade Directory Entries**<br>Name: Spectrum Knitting Co<br>Location: 132-134, Higher Ardwick, Manchester, M12 6DA<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11NE<br>(W) | 957 | - | 385725<br>397164 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 188 | **Contemporary Trade Directory Entries**<br>Name: Xtinct<br>Location: 132-134, Higher Ardwick, Manchester, Lancashire, M12 6DA<br>Classification: Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A11NE<br>(W) | 957 | - | 385725<br>397164 |
| 189 | **Contemporary Trade Directory Entries**<br>Name: Bristol Street Manchester<br>Location: 83, Ashton Old Road, Manchester, M12 6BL<br>Classification: Garage Services<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A17SW<br>(NW) | 945 | - | 385958<br>397637 |
| 189 | **Contemporary Trade Directory Entries**<br>Name: Mercedes Benz Retail Used Cars<br>Location: 83, Ashton Old Road, Manchester, M12 6BL<br>Classification: Car Dealers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A17SW<br>(NW) | 945 | - | 385958<br>397637 |
| 190 | **Contemporary Trade Directory Entries**<br>Name: Joanna N Rainey Ltd<br>Location: 32, Ellingham Close, Manchester, M11 3QP<br>Classification: Cosmetic Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A23SW<br>(N) | 946 | - | 386656<br>398048 |
| 191 | **Contemporary Trade Directory Entries**<br>Name: Cascade<br>Location: 3, Kelbrook Road, Manchester, M11 2DD<br>Classification: Plant & Machinery Manufacturers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A19NE<br>(NE) | 946 | - | 387806<br>397695 |
| 192 | **Contemporary Trade Directory Entries**<br>Name: H & J Supplies Ltd<br>Location: 30-34, Wood Street, Openshaw, Manchester, M11 2FB<br>Classification: Cycle Manufacturers & Wholesalers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A19SE<br>(NE) | 948 | - | 387903<br>397554 |
| 192 | **Contemporary Trade Directory Entries**<br>Name: Little Greene<br>Location: Wood Street, Openshaw, Manchester, M11 2FB<br>Classification: Paint Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A20SW<br>(NE) | 961 | - | 387904<br>397578 |
| 193 | **Contemporary Trade Directory Entries**<br>Name: Ogp Digital Printing<br>Location: Unit 52, Cariocca Business Park, Hellidon Close, Ardwick, Manchester, M12 4AH<br>Classification: Digital Printing<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A11SE<br>(W) | 957 | - | 385723<br>396881 |
| 193 | **Contemporary Trade Directory Entries**<br>Name: Kwik Print<br>Location: Unit 35, Cariocca Business Park, Hellidon Close, Ardwick, Manchester, M12 4AH<br>Classification: Printers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11SE<br>(W) | 963 | - | 385720<br>396869 |
| 193 | **Contemporary Trade Directory Entries**<br>Name: Pestaxe<br>Location: Unit 53, Cariocca Business Park, Hellidon Close, Ardwick, Manchester, M12 4AH<br>Classification: Pest & Vermin Control<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A11SE<br>(W) | 968 | - | 385713<br>396876 |
| 193 | **Contemporary Trade Directory Entries**<br>Name: Mecer<br>Location: Unit 58,Cariocca Business Pk,Hellidon Cl, Ardwick, Manchester, Lancashire, M12 4AH<br>Classification: Electrical Goods Sales, Manufacturers & Wholesalers<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A11SE<br>(W) | 971 | - | 385708<br>396890 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 193 | **Contemporary Trade Directory Entries**<br>Name: Mere Services<br>Location: Unit 50-51, Cariocca Business Park, Hellidon Close, Ardwick, Manchester, Lancashire, M12 4AH<br>Classification: Builders' Merchants<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A11SE<br>(W) | 971 | - | 385712<br>396866 |
| 193 | **Contemporary Trade Directory Entries**<br>Name: Johnston Hewitt<br>Location: Unit 58-61,Cariocca Business Pk,Hellidon Cl, Ardwick, Manchester, Lancashire, M12 4AH<br>Classification: Cleaning Services - Commercial<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A11SE<br>(W) | 972 | - | 385708<br>396886 |
| 193 | **Contemporary Trade Directory Entries**<br>Name: Coolaquest Ltd<br>Location: Unit 48, Cariocca Business Park, Hellidon Close, Ardwick, Manchester, M12 4AH<br>Classification: Water Coolers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11SE<br>(W) | 974 | - | 385710<br>396860 |
| 193 | **Contemporary Trade Directory Entries**<br>Name: Exclusive Mobiles<br>Location: Unit 63, Cariocca Business Park, Hellidon Close, Ardwick, Manchester, M12 4AH<br>Classification: Mobile Phone Accessories and Car Kits<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11SE<br>(W) | 982 | - | 385698<br>396890 |
| 193 | **Contemporary Trade Directory Entries**<br>Name: Chambers Electrical<br>Location: Unit 64, Cariocca Business Park, Hellidon Close, Ardwick, Manchester, M12 4AH<br>Classification: Washing Machines - Servicing & Repairs<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11SE<br>(W) | 984 | - | 385695<br>396891 |
| 193 | **Contemporary Trade Directory Entries**<br>Name: Adrenalin Brands<br>Location: Unit 30, Cariocca Business Park, Hellidon Close, Ardwick, Manchester, Lancashire, M12 4AH<br>Classification: Sports Equipment Manufacturers & Distributors<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A11SE<br>(W) | 984 | - | 385695<br>396896 |
| 193 | **Contemporary Trade Directory Entries**<br>Name: Pro Designs<br>Location: Unit 65,Cariocca Business Pk,Hellidon Cl, Ardwick, Manchester, Lancashire, M12 4AH<br>Classification: Printers<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A11SE<br>(W) | 987 | - | 385692<br>396891 |
| 193 | **Contemporary Trade Directory Entries**<br>Name: Peak Mobility & Handling<br>Location: Unit 68, Cariocca Business Park, Hellidon Close, Ardwick, Manchester, Lancashire, M12 4AH<br>Classification: Mechanical Handling Engineers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11SE<br>(W) | 995 | - | 385683<br>396895 |
| 193 | **Contemporary Trade Directory Entries**<br>Name: Macs<br>Location: Unit 27, Cariocca Business Park, Hellidon Close, Ardwick, Manchester, M12 4AH<br>Classification: Automation Systems & Equipment<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11SE<br>(W) | 999 | - | 385679<br>396903 |
| 193 | **Contemporary Trade Directory Entries**<br>Name: Dam Express<br>Location: Unit 27, Cariocca Business Park, Hellidon Close, Ardwick, Manchester, M12 4AH<br>Classification: Bus & Coach Operators & Stations<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11SE<br>(W) | 999 | - | 385679<br>396903 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 193 | **Contemporary Trade Directory Entries**<br>Name: Mcl Photo Lab<br>Location: Unit 27, Cariocca Business Park, Hellidon Close, Ardwick, Manchester, M12 4AH<br>Classification: Photographic Processors<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11SE<br>(W) | 999 | - | 385679<br>396903 |
| 194 | **Contemporary Trade Directory Entries**<br>Name: Kingfisher Service Station<br>Location: 441, Stockport Road, Manchester, M12 4JB<br>Classification: Petrol Filling Stations - 24 Hour<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the address or location | A3NW<br>(S) | 957 | - | 386569<br>395903 |
| 195 | **Contemporary Trade Directory Entries**<br>Name: Rink Air Conditioning Ltd<br>Location: Midland St, Manchester, Lancashire, M12 6LB<br>Classification: Air Conditioning Equipment & Systems<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A16SE<br>(NW) | 960 | - | 385826<br>397473 |
| 196 | **Contemporary Trade Directory Entries**<br>Name: Money Enterprises (Uk) Ltd<br>Location: 128, Clayton Lane, Manchester, M11 2AG<br>Classification: Distribution Services<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A19NE<br>(NE) | 961 | - | 387675<br>397847 |
| 196 | **Contemporary Trade Directory Entries**<br>Name: Sportcity Service & Mot Station<br>Location: Clayton La, Manchester, Lancashire, M11 2AG<br>Classification: Garage Services<br>**Status:** **Inactive**<br>Positional Accuracy: Manually positioned within the geographical locality | A19NE<br>(NE) | 962 | - | 387675<br>397847 |
| 196 | **Contemporary Trade Directory Entries**<br>Name: Stp<br>Location: 4, Kelbrook Road, Manchester, M11 2QA<br>Classification: Door Manufacturers - Domestic<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A19NE<br>(NE) | 963 | - | 387711<br>397818 |
| 197 | **Contemporary Trade Directory Entries**<br>Name: Mac Clothing Ltd<br>Location: Unit 2 ,Preston St, Manchester, Lancashire, M18 8DB<br>Classification: Clothing & Fabrics - Manufacturers<br>**Status:** **Active**<br>Positional Accuracy: Manually positioned to the road within the address or location | A15SW<br>(E) | 976 | - | 388084<br>396896 |
| 198 | **Contemporary Trade Directory Entries**<br>Name: A B D Transport Services Ltd<br>Location: Unit 40, Cariocca Business Park, Hellidon Close, Ardwick, Manchester, M12 4AH<br>Classification: Road Haulage Services<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11SE<br>(W) | 976 | - | 385711<br>396841 |
| 199 | **Contemporary Trade Directory Entries**<br>Name: Dimensions<br>Location: 13-15, Richmond Grove, Manchester, M13 0LN<br>Classification: Knitwear Manufacturers & Wholesalers<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A2NE<br>(SW) | 985 | - | 386293<br>395960 |
| 200 | **Contemporary Trade Directory Entries**<br>Name: P G A Rewinds<br>Location: 58, Temperance Street, MANCHESTER, M12 6DP<br>Classification: Electric Motor Sales & Service<br>**Status:** **Active**<br>Positional Accuracy: Automatically positioned to the address | A11NE<br>(W) | 990 | - | 385726<br>397313 |
| 201 | **Contemporary Trade Directory Entries**<br>Name: Chatfields<br>Location: Ashton Old Road, Manchester, M12 6JD<br>Classification: Commercial Vehicle Dealers<br>**Status:** **Inactive**<br>Positional Accuracy: Automatically positioned to the address | A16SE<br>(NW) | 997 | - | 385831<br>397555 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Fuel Station Entries** | | | | |
| 202 | Name: Hydro Self Serve<br>Location: 225-255, Hyde Road, MANCHESTER, Lancashire, M12 5AZ<br>Brand: Obsolete<br>Premises Type: Not Applicable<br>**Status:** **Obsolete**<br>Positional Accuracy: Automatically positioned to the address | A12SE<br>(W) | 472 | - | 386233<br>396808 |
| | **Fuel Station Entries** | | | | |
| 203 | Name: Belle Vue Filling Station<br>Location: 545, Hyde Road, Manchester, M12 5NQ<br>Brand: Unbranded<br>Premises Type: Petrol Station<br>**Status:** **Closed**<br>Positional Accuracy: Manually positioned to the address or location | A9NW<br>(SE) | 494 | - | 387276<br>396503 |
| | **Fuel Station Entries** | | | | |
| 204 | Name: Mercury Filling Station<br>Location: 351, Stockport Road, Manchester, M13 0LF<br>Brand: Unbranded<br>Premises Type: Not Applicable<br>**Status:** **Obsolete**<br>Positional Accuracy: Manually positioned to the address or location | A7SE<br>(SW) | 841 | - | 386342<br>396097 |
| | **Fuel Station Entries** | | | | |
| 205 | Name: Ardwick Service Station<br>Location: 38 Ashton Old Road, Manchester, M12 6LP<br>Brand: Obsolete<br>Premises Type: Not Applicable<br>**Status:** **Obsolete**<br>Positional Accuracy: Automatically positioned to the address | A17SW<br>(NW) | 903 | - | 385975<br>397593 |
| | **Fuel Station Entries** | | | | |
| 206 | Name: Kingfisher Garage<br>Location: 441, Stockport Road, Manchester, M12 4JB<br>Brand: Harvest Energy<br>Premises Type: Petrol Station<br>**Status:** **Open**<br>Positional Accuracy: Manually positioned to the address or location | A3NW<br>(S) | 944 | - | 386567<br>395917 |

| Agency & Hydrological | Version | Update Cycle |
|---|---|---|
| **Contaminated Land Register Entries and Notices** | | |
| Stockport Metropolitan Borough Council - Environment Team (Land & Water) | December 2014 | Annual Rolling Update |
| Rochdale Metropolitan Borough Council - Environmental Health Department | March 2015 | Annually |
| 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 |
| Oldham Metropolitan Borough Council - Environmental Health Department | September 2013 | Annual Rolling Update |
| Manchester City Council - Environmental Health Department | September 2014 | Annual Rolling Update |
| **Discharge Consents** | | |
| Environment Agency - North West Region | July 2015 | 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 | July 2015 | Quarterly |
| **Local Authority Integrated Pollution Prevention And Control** | | |
| Rochdale Metropolitan Borough Council - Environmental Health Department | July 2014 | Annual Rolling Update |
| Tameside Metropolitan Borough Council - Environmental Health Department | June 2015 | Annual Rolling Update |
| Oldham Metropolitan Borough Council - Environmental Health Department | March 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** | | |
| Rochdale Metropolitan Borough Council - Environmental Health Department | July 2014 | Annual Rolling Update |
| Trafford Metropolitan Borough Council - Environmental Health Department | July 2015 | Annual Rolling Update |
| Tameside Metropolitan Borough Council - Environmental Health Department | June 2015 | Annual Rolling Update |
| Oldham Metropolitan Borough Council - Environmental Health Department | March 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** | | |
| Rochdale Metropolitan Borough Council - Environmental Health Department | July 2014 | 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 |
| Trafford Metropolitan Borough Council - Environmental Health Department | October 2014 | Annual Rolling Update |
| Oldham Metropolitan Borough Council - Environmental Health Department | September 2013 | 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 |

| Agency & Hydrological | Version | Update Cycle |
|---|---|---|
| **River Quality Chemistry Sampling Points**<br>Environment Agency - Head Office | July 2012 | Annually |
| **Substantiated Pollution Incident Register**<br>Environment Agency - North West Region - South Area | July 2015 | Quarterly |
| **Water Abstractions**<br>Environment Agency - North West Region | April 2015 | Quarterly |
| **Water Industry Act Referrals**<br>Environment Agency - North West Region | July 2015 | Quarterly |
| **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 | July 2015 | Quarterly |
| **Extreme Flooding from Rivers or Sea without Defences**<br>Environment Agency - Head Office | May 2015 | Quarterly |
| **Flooding from Rivers or Sea without Defences**<br>Environment Agency - Head Office | May 2015 | Quarterly |
| **Areas Benefiting from Flood Defences**<br>Environment Agency - Head Office | May 2015 | Quarterly |
| **Flood Water Storage Areas**<br>Environment Agency - Head Office | May 2015 | Quarterly |
| **Flood Defences**<br>Environment Agency - Head Office | May 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 |
| **Historical Landfill Sites** | | |
| Environment Agency - North West Region - South Area | May 2015 | Quarterly |
| **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 | August 2014 | Quarterly |
| **Licensed Waste Management Facilities (Locations)** | | |
| Environment Agency - North West Region - South Area | July 2015 | Quarterly |
| **Local Authority Landfill Coverage** | | |
| Manchester City Council - Planning Department | May 2000 | Not Applicable |
| Oldham Metropolitan Borough Council | May 2000 | Not Applicable |
| Rochdale Metropolitan Borough Council - Environmental Health 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 |
| Oldham Metropolitan Borough Council | May 2000 | Not Applicable |
| Rochdale Metropolitan Borough Council - Environmental Health 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** | | |
| Oldham Metropolitan Borough Council | January 2015 | Annual Rolling Update |
| Stockport Metropolitan Borough Council - Environment and Economic Development | November 2014 | Annual Rolling Update |
| Trafford Metropolitan Borough Council | November 2014 | Annual Rolling Update |
| Manchester City Council - Planning Department | September 2014 | Annual Rolling Update |
| Rochdale Metropolitan Borough Council | September 2014 | Annual Rolling Update |
| Salford City Council | September 2014 | Annual Rolling Update |
| Tameside Metropolitan Borough Council - Planning and Building Control | September 2014 | Annual Rolling Update |
| **Planning Hazardous Substance Consents** | | |
| Oldham Metropolitan Borough Council | January 2015 | Annual Rolling Update |
| Stockport Metropolitan Borough Council - Environment and Economic Development | November 2014 | Annual Rolling Update |
| Trafford Metropolitan Borough Council | November 2014 | Annual Rolling Update |
| Manchester City Council - Planning Department | September 2014 | Annual Rolling Update |
| Rochdale Metropolitan Borough Council | September 2014 | Annual Rolling Update |
| Salford City Council | September 2014 | Annual Rolling Update |
| Tameside Metropolitan Borough Council - Planning and Building Control | September 2014 | Annual Rolling Update |

| 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 | May 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 - Mining Report Service | 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 | August 2015 | Quarterly |
| **Fuel Station Entries**<br>Catalist Ltd - Experian | August 2015 | Quarterly |

| Sensitive Land Use | Version | Update Cycle |
|---|---|---|
| **Areas of Adopted Green Belt** | | |
| Manchester City Council | May 2015 | As notified |
| Oldham Metropolitan Borough Council | May 2015 | As notified |
| Rochdale Metropolitan Borough Council | May 2015 | As notified |
| Salford City Council | May 2015 | As notified |
| Stockport Metropolitan Borough Council | May 2015 | As notified |
| Tameside Metropolitan Borough Council | May 2015 | As notified |
| Trafford Metropolitan Borough Council | May 2015 | As notified |
| **Areas of Unadopted Green Belt** | | |
| Manchester City Council | May 2015 | As notified |
| Oldham Metropolitan Borough Council | May 2015 | As notified |
| Rochdale Metropolitan Borough Council | May 2015 | As notified |
| Salford City Council | May 2015 | As notified |
| Stockport Metropolitan Borough Council | May 2015 | As notified |
| Tameside Metropolitan Borough Council | May 2015 | As notified |
| Trafford Metropolitan Borough Council | May 2015 | As notified |
| **Areas of Outstanding Natural Beauty** | | |
| Natural England | February 2015 | Bi-Annually |
| **Environmentally Sensitive Areas** | | |
| Natural England | August 2014 | Annually |
| **Forest Parks** | | |
| Forestry Commission | April 1997 | Not Applicable |
| **Local Nature Reserves** | | |
| Natural England | April 2015 | Bi-Annually |
| **Marine Nature Reserves** | | |
| Natural England | July 2013 | Bi-Annually |
| **National Nature Reserves** | | |
| Natural England | March 2015 | Bi-Annually |
| **National Parks** | | |
| Natural England | August 2015 | Bi-Annually |
| **Nitrate Sensitive Areas** | | |
| Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA) | February 2012 | Not Applicable |
| **Nitrate Vulnerable Zones** | | |
| Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA) | July 2014 | Annually |
| **Ramsar Sites** | | |
| Natural England | March 2014 | Bi-Annually |
| **Sites of Special Scientific Interest** | | |
| Natural England | April 2015 | Bi-Annually |
| **Special Areas of Conservation** | | |
| Natural England | March 2014 | Bi-Annually |
| **Special Protection Areas** | | |
| Natural England | April 2015 | Bi-Annually |

# Data Suppliers

A selection of organisations who provide data within this report

| Data Supplier | Data Supplier Logo |
|---|---|
| **Ordnance Survey** | Ordnance Survey®<br>Licensed Partner |
| **Environment Agency** | Environment Agency |
| **Scottish Environment Protection Agency** | SEPA<br>Scottish Environment Protection Agency |
| **The Coal Authority** | THE COAL AUTHORITY |
| **British Geological Survey** | BGS 1835<br>British Geological Survey<br>NATURAL ENVIRONMENT RESEARCH COUNCIL |
| **Centre for Ecology and Hydrology** | CEH<br>Centre for Ecology & Hydrology<br>NATURAL ENVIRONMENT RESEARCH COUNCIL |
| **Natural Resources Wales** | Cyfoeth Naturiol Cymru<br>Natural Resources Wales |
| **Scottish Natural Heritage** | SCOTTISH NATURAL HERITAGE |
| **Natural England** | NATURAL ENGLAND |
| **Public Health England** | Public Health England |
| **Ove Arup** | ARUP |
| **Peter Brett Associates** | pba<br>peterbrett |

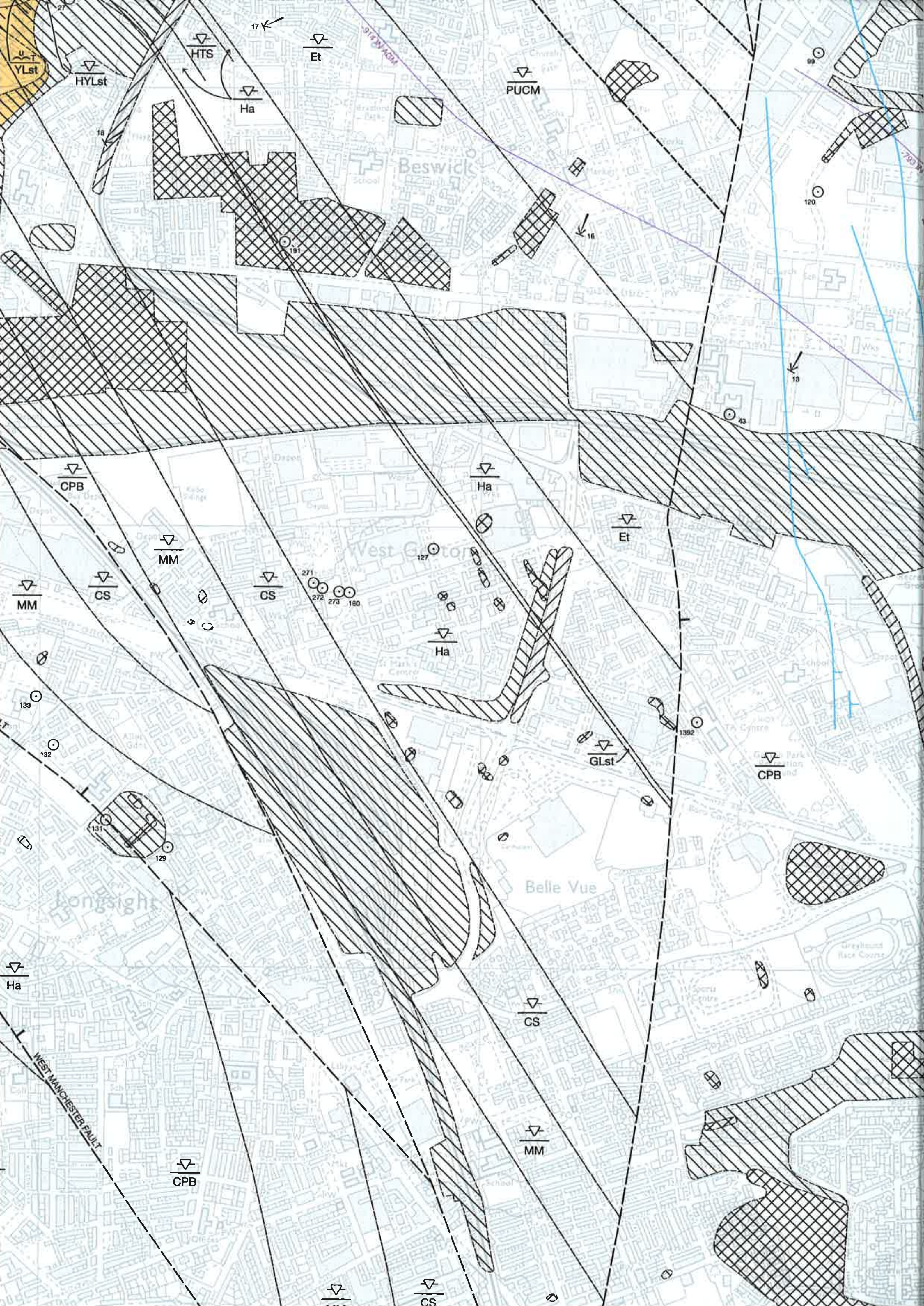
# Useful Contacts

| 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: 08708 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 - Mining Report Service**<br>200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG | Telephone: 0845 7626848<br>Email: thecoalauthority@coal.gov.uk |
| 6 | **Peter Brett Associates**<br>Caversham Bridge House, Waterman Place, Reading, Berkshire, RG1 8DN | Telephone: 0118 950 0761<br>Fax: 0118 959 7498<br>Email: reading@pba.co.uk<br>Website: www.pba.co.uk |
| 7 | **Manchester City Council**<br>Town Hall, Albert Square, Manchester, Greater Manchester, M60 2JT | Telephone: 0161 234 5000<br>Fax: 0161 234 4508<br>Website: www.manchester.gov.uk |
| 8 | **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 |
| 9 | **Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)**<br>Government Buildings, Otley Road, Lawnswood, Leeds, West Yorkshire, LS16 5QT | Telephone: 0113 2613333<br>Fax: 0113 230 0879 |
| 10 | **Environment Agency - Head Office**<br>Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, Avon, BS32 4UD | Telephone: 01454 624400<br>Fax: 01454 624409 |
| 11 | **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 |

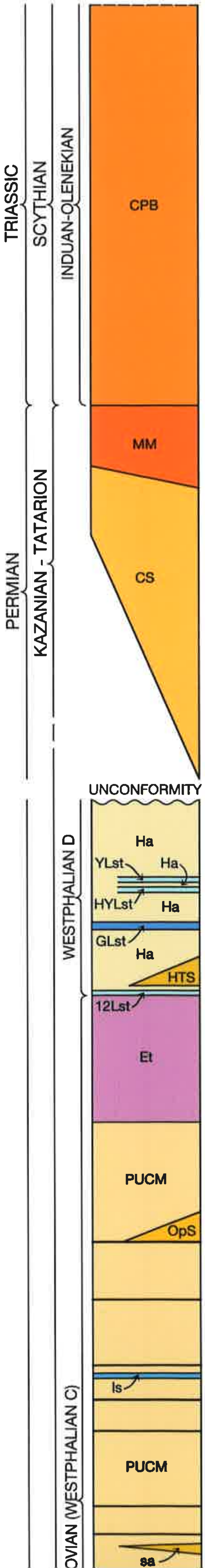
Please note that the Environment Agency / Natural Resources Wales / SEPA have a charging policy in place for enquiries.

# APPENDIX 6

## EXTRACTS OF BGS GEOLOGICAL MAP, BGS BOREHOLE LOGS AND MINING AND GROUND STABILITY REPORT


YLst
HYLst
HTS
17
Et
-914 IN AGM
Ha
PUCM
99
Beswick
18
-793 IN
120
191
16
13
43
CPB
Ha
Et
MM
CS
MM
CS
271
272
273
160
127
West Gorton
Ha
133
132
1392
GLst
CPB
131
129
Belle Vue
Longsight
Ha
CS
MM
WEST MANCHESTER FAULT
CPB
CS

Scale 1:4000 (1cm to 40m)


TRIASSIC
SCYTHIAN
INDUAN-OLENEKIAN
PERMIAN
KAZANIAN - TATARION
WESTPHALIAN D
OVIAN (WESTPHALIAN C)
CPB
MM
CS
UNCONFORMITY
Ha
YLst
Ha
HYLst
Ha
GLst
Ha
HTS
12Lst
Et
PUCM
OpS
ls
PUCM
sa

CHESTER PEBBLE BEDS FORMATION 300
Sandstone, reddish-brown, trough cross-bedded and massive, rarely pebbly, with subordinate reddish-brown mudstone interbeds

SHERWOOD SANDSTONE GROUP

MANCHESTER MARLS FORMATION 44-60
Mudstone, red-brown

CUMBRIAN COAST GROUP

COLLYHURST SANDSTONE FORMATION 52-220
Sandstone, orange, well-sorted, with large scale aeolian dune bedding

APPLEBY GROUP

HALESOWEN FORMATION 148
Mudstone, with subordinate beds of sandstone and limestone

YARD MINE LIMESTONE (Not shown on mapface) 1.1
Limestone, grey

HALF YARD MINE LIMESTONE (Not shown on mapface) 0.8
Limestone, grey

GREAT MINE LIMESTONE 1.5-2.7
Limestone, grey

HOLT TOWN SANDSTONE 0-24

12th LIMESTONE 0.6
Limestone, grey

ETRURIA FORMATION 92
Mudstone, red-brown, with subordinate sandstone interbeds

WARWICKSHIRE GROUP c. 240
Mudstone, red, purple, brown, ocherous, grey and green, mottled, commonly pedogenic, interbedded with sandstone and thin limestones

OPENSHAW SANDSTONE 0-24
Sandstone, dark reddish-brown

**OPENSHAW COAL (OPSC) 0.8**

**CHARLOTTE COAL (CHTC) 0.5**

**BRADFORD THREE-QUARTERS COAL (Br3QRs) 0.5**

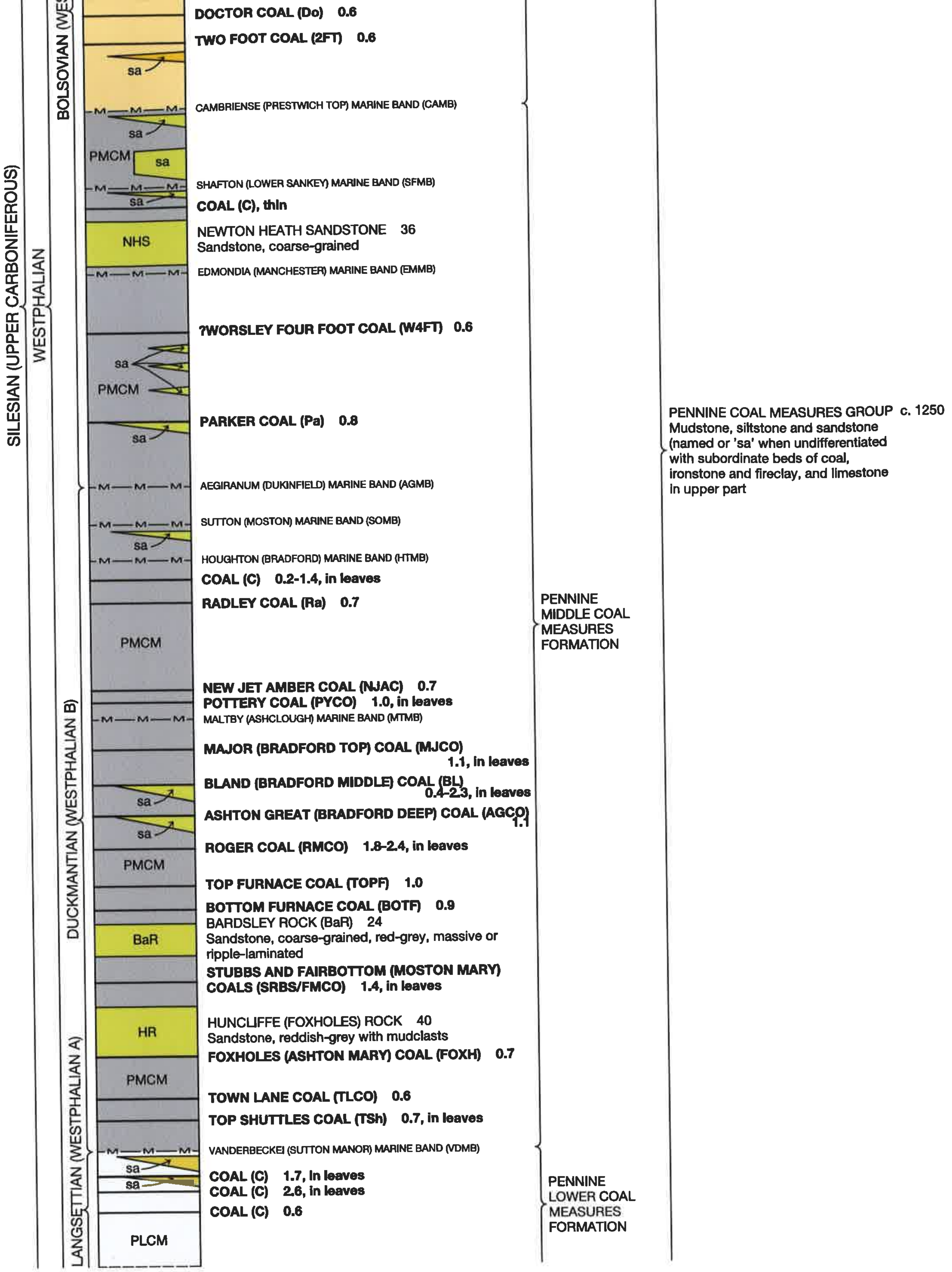
**BRADFORD FOUR-FOOT COAL (Br4FT) 1.4**

**YARD COAL (Yd) 0.5-1.2**

**DOCTOR COAL (Do) 0.6**

**TWO FOOT COAL (2FT) 0.6**

PENNINE
UPPER COAL
MEASURES
FORMATION


SILESIAN (UPPER CARBONIFEROUS)
WESTPHALIAN
BOLSOVIAN (WES
DUCKMANTIAN (WESTPHALIAN B)
LANGSETTIAN (WESTPHALIAN A)
DOCTOR COAL (Do) 0.6
TWO FOOT COAL (2FT) 0.6
sa
CAMBRIENSE (PRESTWICH TOP) MARINE BAND (CAMB)
M
sa
PMCM
sa
SHAFTON (LOWER SANKEY) MARINE BAND (SFMB)
sa
COAL (C), thin
NHS
NEWTON HEATH SANDSTONE 36
Sandstone, coarse-grained
EDMONDIA (MANCHESTER) MARINE BAND (EMMB)
?WORSLEY FOUR FOOT COAL (W4FT) 0.6
sa
PMCM
PARKER COAL (Pa) 0.8
sa
AEGIRANUM (DUKINFIELD) MARINE BAND (AGMB)
SUTTON (MOSTON) MARINE BAND (SOMB)
sa
HOUGHTON (BRADFORD) MARINE BAND (HTMB)
COAL (C) 0.2-1.4, in leaves
RADLEY COAL (Ra) 0.7
PMCM
NEW JET AMBER COAL (NJAC) 0.7
POTTERY COAL (PYCO) 1.0, in leaves
MALTBY (ASHCLOUGH) MARINE BAND (MTMB)
MAJOR (BRADFORD TOP) COAL (MJCO) 1.1, in leaves
BLAND (BRADFORD MIDDLE) COAL (BL) 0.4-2.3, in leaves
sa
ASHTON GREAT (BRADFORD DEEP) COAL (AGCO) 1.1
sa
ROGER COAL (RMCO) 1.8-2.4, in leaves
PMCM
TOP FURNACE COAL (TOPF) 1.0
BOTTOM FURNACE COAL (BOTF) 0.9
BaR
BARDSLEY ROCK (BaR) 24
Sandstone, coarse-grained, red-grey, massive or ripple-laminated
STUBBS AND FAIRBOTTOM (MOSTON MARY) COALS (SRBS/FMCO) 1.4, in leaves
HR
HUNCLIFFE (FOXHOLES) ROCK 40
Sandstone, reddish-grey with mudclasts
FOXHOLES (ASHTON MARY) COAL (FOXH) 0.7
PMCM
TOWN LANE COAL (TLCO) 0.6
TOP SHUTTLES COAL (TSh) 0.7, in leaves
VANDERBECKEI (SUTTON MANOR) MARINE BAND (VDMB)
sa
sa
COAL (C) 1.7, in leaves
COAL (C) 2.6, in leaves
COAL (C) 0.6
PLCM
PENNINE MIDDLE COAL MEASURES FORMATION
PENNINE LOWER COAL MEASURES FORMATION
PENNINE COAL MEASURES GROUP c. 1250
Mudstone, siltstone and sandstone (named or 'sa' when undifferentiated with subordinate beds of coal, ironstone and fireclay, and limestone in upper part

C07/044
LSCSL

**British Geological Survey**
NATURAL ENVIRONMENT RESEARCH COUNCIL

## 1:10 000 Geology Series

# SHEET SJ89NE

## (Gorton)

### Included in 1:50 000 Geological Sheet 85 (Manchester)

Original geological survey at 1:10 560 scale by E Hull, published 1862-4. Resurveyed at 1:10 560 scale by L H Tonks and W Lloyd in 1924-7, published 1929. Bedrock geology revised by J I Chisholm in 1973. Reconstituted at the 1:10 000 scale with artificially modified ground and minor amendments to bedrock and superficial deposits by R A Ellison in 2001.
P J Strange, Regional Geologist.
Released 2004. David A Falvey, PhD., Executive Director, British Geological Survey.

NATURAL ENVIRONMENT RESEARCH COUNCIL

Geological map © NERC 2004. All rights reserved.

Ordnance Survey

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British Geological Survey Ordnance Survey licence number 100037272 2004.

The representation on this map of a road, track or path is no evidence of the existence of a right of way.
Heights are in metres. Contours are shown at 5 metres vertical interval.
Made by the Ordnance Survey, Southampton.

## KEY

### SUPERFICIAL DEPOSITS

ARTIFICIALLY MODIFIED GROUND

| | | |
|---|---|---|
| ▨ | Worked Ground | Mainly road and railway cuttings |
| ▧ | Made Ground | Mainly railway embankments, colliery spoil, and landfill |
| ▦ | Infilled Ground | Mainly backfilled brickpits and infilled canal and rail cuttings |

### QUATERNARY DEPOSITS

| | | |
|---|---|---|
| ▥ | Landslip | |
| 🟨 ⌣T | River Terrace Deposits (undifferentiated) | Sand and gravel, unconsolidated |
| 🟪 ⊖ | Glaciofluvial Deposits (undifferentiated) | Sand and gravel, with silty lenses |
| ▽ | Till | Clay and silty clay, pebbly, reddish-brown, stiff, sandy |

The Quaternary Deposits listed above are not necessarily shown in order of superposition

⊖ CPB — Symbol indicates Quaternary Deposit at surface and Bedrock Formation at rockhead; other Quaternary Deposits may intervene

FOR BEDROCK GEOLOGY SEE GENERALIZED VERTICAL SECTION

- - - - - - - Geological boundary, Artificial and Quaternary Deposits

——— Geological boundary, Bedrock

PUC
CS
CS
MM
166
187
188
183
184
105
Ancoat
CPI
CPB
99
98
STER

| | |
|---|---|
| | Geological boundary, Bedrock |
| | Fault at rockhead, crossmark on downthrow side |
| | Fault underground, crossmark on downthrow side |
| | Coal outcrop, name on the younging-direction side of the outcrop |
| M M | Marine band |

Broken lines denote inferred boundaries

| | |
|---|---|
| 12 | Inclined strata, dip in degrees |
| 8 | Inclined strata measured underground, dip in degrees |
| 109 ⊙ | Borehole |
| -300 IN WH | Contour in seam (Figures for levels above datum on the high side of the line and those for levels below datum on the low side) |

Only geologically more significant boreholes are shown. The true location of some boreholes and shafts is uncertain. Other shafts may exist.

Whilst efforts have been made to trace the sites of mine shafts and adits, it is not claimed that all have been shown on the map.

Numbers are those of the BGS record system, in which they are preceded by a sheet number.

For detailed information on old workings, information on present and future coal mining (underground or opencast), and information on exact positions and locations of mine shafts, you should apply to The Coal Authority.

Depths and thicknesses are given in metres

This map gives an interpretation of the data available at the last date of survey or time of map compilation. This map is derived from 1:10 000 scale maps and may involve some generalization of the geology. Additional information and manuscript field-maps are available in BGS files. Any questions about access to such additional information should be directed to the BGS Enquiry Service.

Diagram showing incidence of 1:10 560 Lancashire County Geological Sheets in relation to SJ89NE

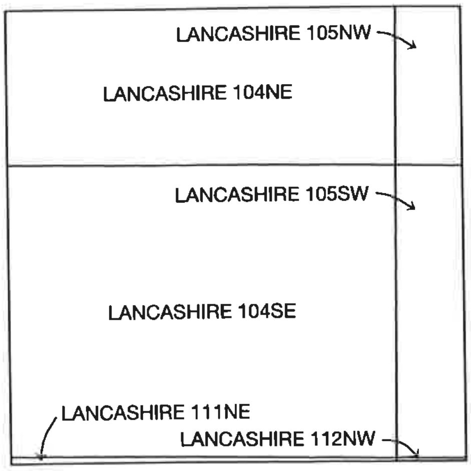
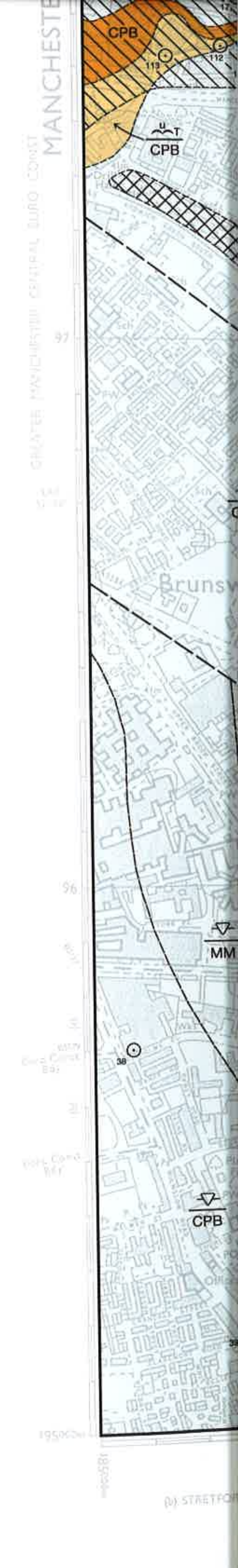


Diagram showing adjoining 1:10 000 National Grid Sheets

| | | |
|---|---|---|
| SD80SW | SD80SE | SD90SW |
| SJ89NW | SJ89NE | SJ99NW |
| SJ89SW | SJ89SE | SJ99SW |

| SHEET No. | VERSION No. | PLOT FILE GENERATION DATE |
|---|---|---|
| SJ89NE | 1 | 06/10/2004 |



49 148 No. 77 Drawn up.

(621) Wt. 5990—S.33 2000 6/22 **Gp. 147** M.R.Co.Ltd.

**SECTION OF** Borehole at Brooks + Doxey Thomas St., West Gorton

SJ89NE127

Maps: One-inch 85 Six-inch [illegible] County Lancashire

Height above O.D. Ca +170' Latitude Longitude

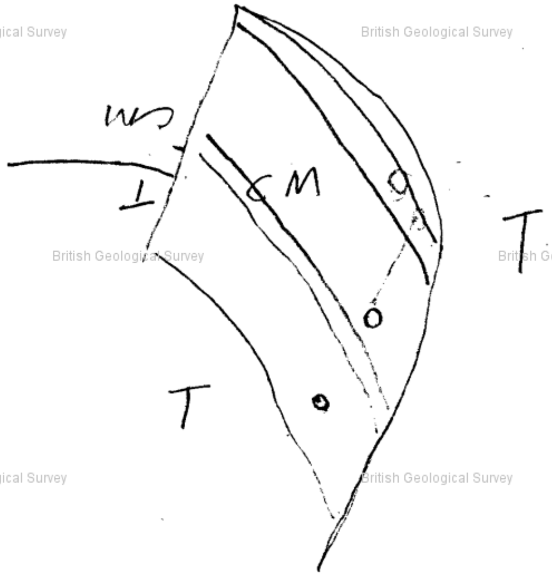
Communicated by Date of sinking

Made by Dip of Strata

5/1045 C77 M/c 96

| | Thickness. | Depth from Surface. Metres. | | |
|---|---|---|---|---|
| Earth | | 1·83 | 6 | — |
| Grey clay | | 10·97 | 36 | — |
| Grey shale | | 23·17 | 76 | — |
| Red shale | | 24·99 | 82 | — |
| Black shale | | 28·65 | 94 | — |
| Grey shale | | 34·75 | 114 | — |
| Limestone ~ [illegible] | | 39·32 | 129 | — |
| Fireclay | | 41·15 | 135 | — |
| Limestone | | 41·76 | 137 | — |
| Fireclay | | 42·67 | 140 | — |
| Limestone | | 42·98 | 141 | — |
| Fireclay | | 44·50 | 146 | — |
| Limestone | | 45·11 | 148 | — |
| Fireclay | | 46·03 | 151 | — |
| Not entered — Probably sandstone | | 61·27 | 201 | |

At this point → large vols. of gas tar were thrown out.



SJ89/115

SJ 8686 9695

No. 77 Drawn up.

(621) Wt. 5990—S.33 3000 6/22 Gp. 147 M.R.Co.Ltd.

**SECTION OF** Borehole at Brooks & Doxey Thomas St, West Gorton

Maps: One-inch 85 Six-inch 104 SE County Lancashire

Height above O.D. c + 170' Latitude Longitude

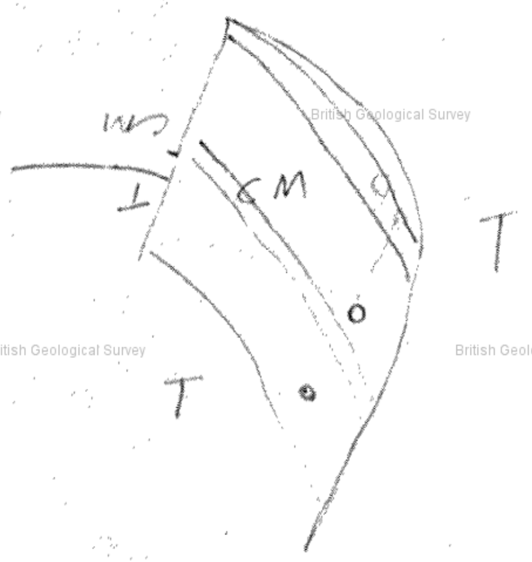
Communicated by Date of sinking

Made by Dip of Strata

1:C G. 77 M/c 96

| | Thickness. | Depth from Surface. |
|---|---|---|
| Earth | | 6 — |
| Grey clay | | 36 — |
| Grey shale | | 76 — |
| Red shale | | 82 — |
| Black shale | | 94 — |
| Grey shale | | 114 — |
| Limestone | | 129 — |
| Fireclay | | 135 — |
| Limestone | | 137 — |
| Fireclay | | 140 — |
| Limestone | | 141 — |
| Fireclay | | 146 — |
| Limestone | | 148 — |
| Fireclay | | 151 — |
| Not entered — Probably sandstone | | 201 |

At this point → large vols. of gas & water thrown out.



British Geological Survey

Lancs 104 SE 1/77

SJ89NE 274

# HOLST & CO. LTD.

8669 9683

SITE INVESTIGATION DEPT.

5-7 NEW YORK ROAD

LEEDS 2

Contract No. 17813/B.516.

Location Thomas Street, Mandhester.

Client Manchester City Architect.

Borehole No. 4

Ground Level 167.17 A.O.D.

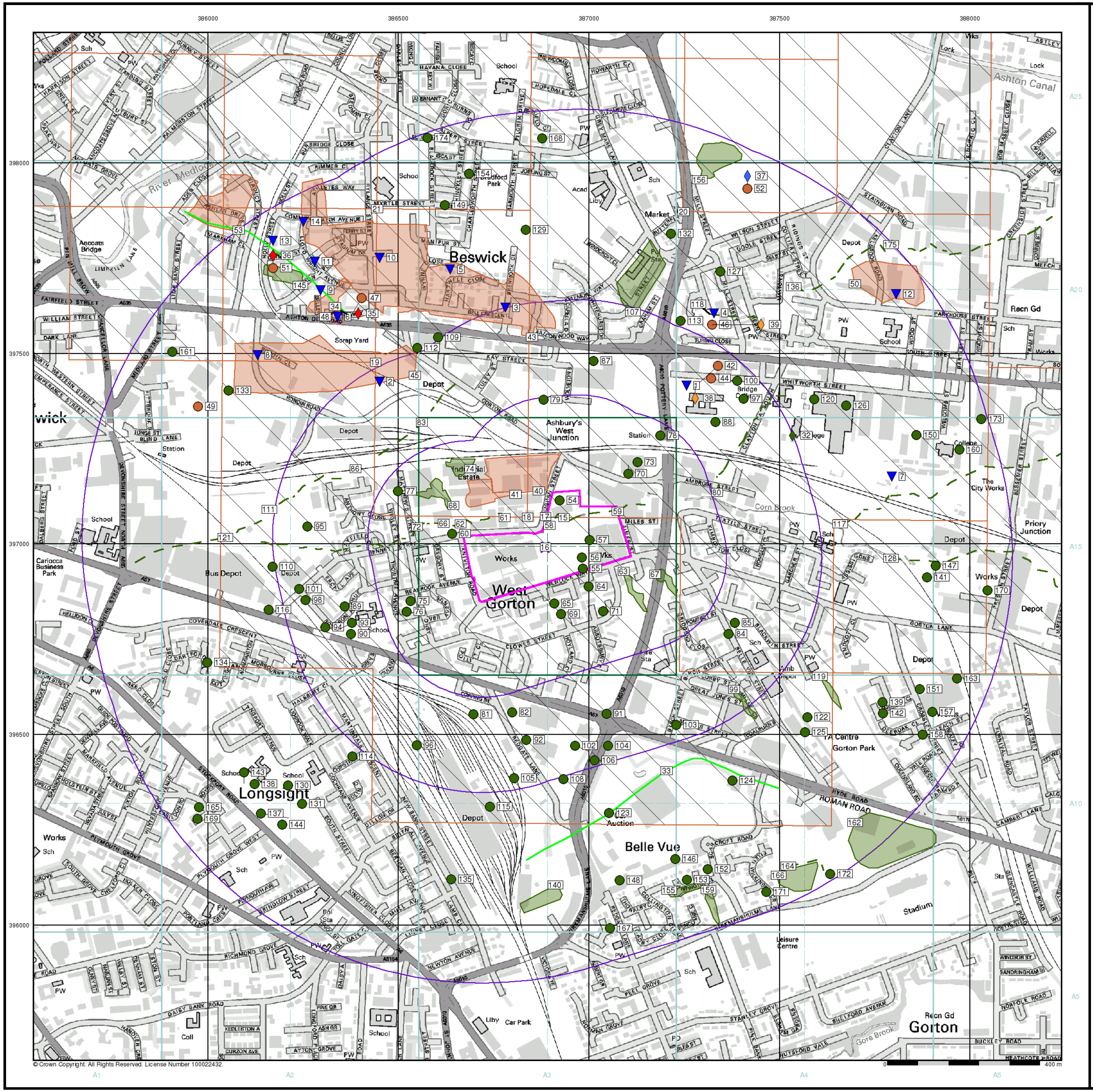
Date 24th January, 1966

## BOREHOLE LOG

| STRATA | Legend | Depth below Ground Level | Thickness of Strata | Type of Sample | c. lb./sq. ft. | Ø deg. | m.c. % | y lb./cu. ft. | N |
|---|---|---|---|---|---|---|---|---|---|
| Made Ground. | | 2'6" | 2'6" | | | | | | |
| Moist Red Sand with Bands of Clay. | | 7'6" | 5'0" | 5'0"<br>I<br>10'0" | [illegible] | | [illegible] | [illegible] | 6 |
| Very Stiff Sandy Boulder Clay with Sand Pockets. | | 14'0" | 6'6" | ▯ | 12700 | | 7 | 140 | |
| Very Stiff Boulder Clay. | | 27'0" | 13'0" | 15'0"<br>▯ | 8600 | | 9 | 141 | |
| Red Mudstone. | | 28'0" | 1'0" | | | | | | |
| Fairly Muddy Grey Limestone. | | 33'0" | 5'0" | | | | | | |
| Pinkish Grey Silty Calcareous Mudstone. | | 43'6" | 10'6" | | | | | | |
| Grey Muddy Limestone. | | 47'0" | 3'6" / 3'6" | | | | | | |
| Pink and Grey Very Calcareous Silty Mudstone. | | 49'0" | 2'0" | | | | | | |
| Grey Muddy Limestone | | 53'0" | 4'0" | | | | | | |
| Pink and Grey Calcareous Silty Mudstone. | | 56'0" | 3'0" | | | | | | |
| Grey Muddy Limestone. | | 60'0" | 4'0" | | | | | | |
| Pink and Grey Calcareous Silty Mudstone. | | 75'0" | 15'0" | | | | | | |

Water struck [illegible] Final Standing Level

British Geological Survey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Priory Junction
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**Envirocheck® Mining**

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

## General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point
- 8 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 | ◆ | — | ▧ |

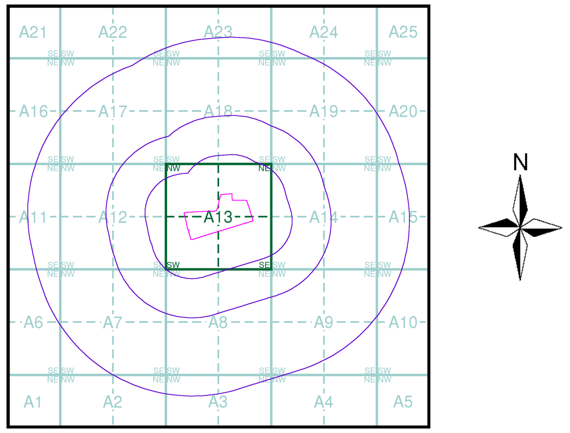
## Historical Land Use

| | 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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## Order Details

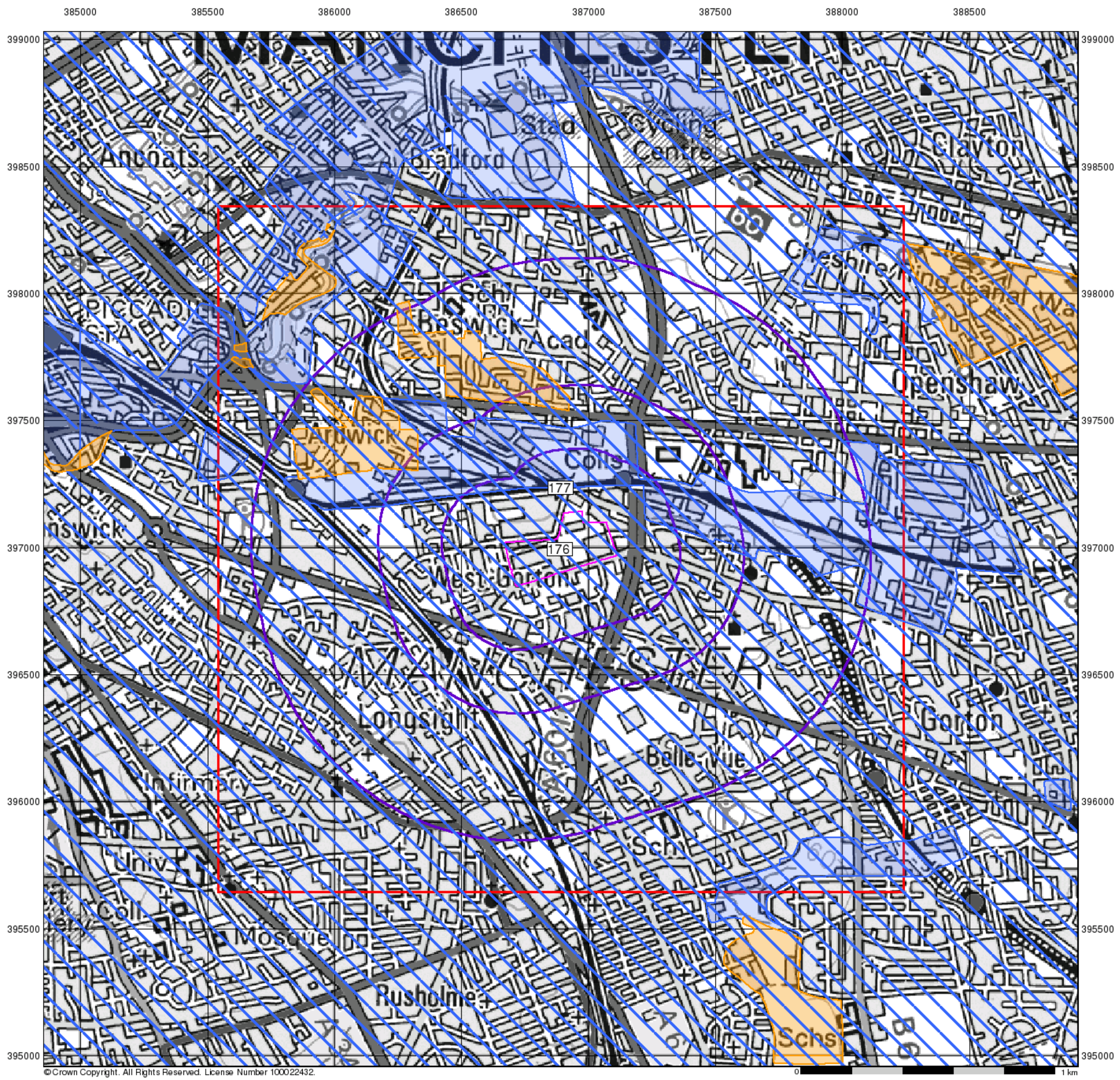
| | |
|---|---|
| Order Number: | 73720566_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

**Landmark** Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk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Cheshire
Openshaw
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Beswick
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**Envirocheck®** Mining

# Ground Stability Data (1:50,000)

## General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point
- ☐ Slice
- Map ID

## Potential for Compressible Ground Stability Hazards

| | | | |
|---|---|---|---|
| 🟥 | High | 🟩 | Low |
| 🟧 | Moderate | 🟦 | Very Low |

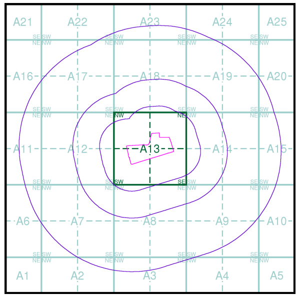
## Potential for Collapsible Ground Stability Hazards

| | | | |
|---|---|---|---|
| ▧ | 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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## Order Details

| | |
|---|---|
| Order Number: | 73720566_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

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

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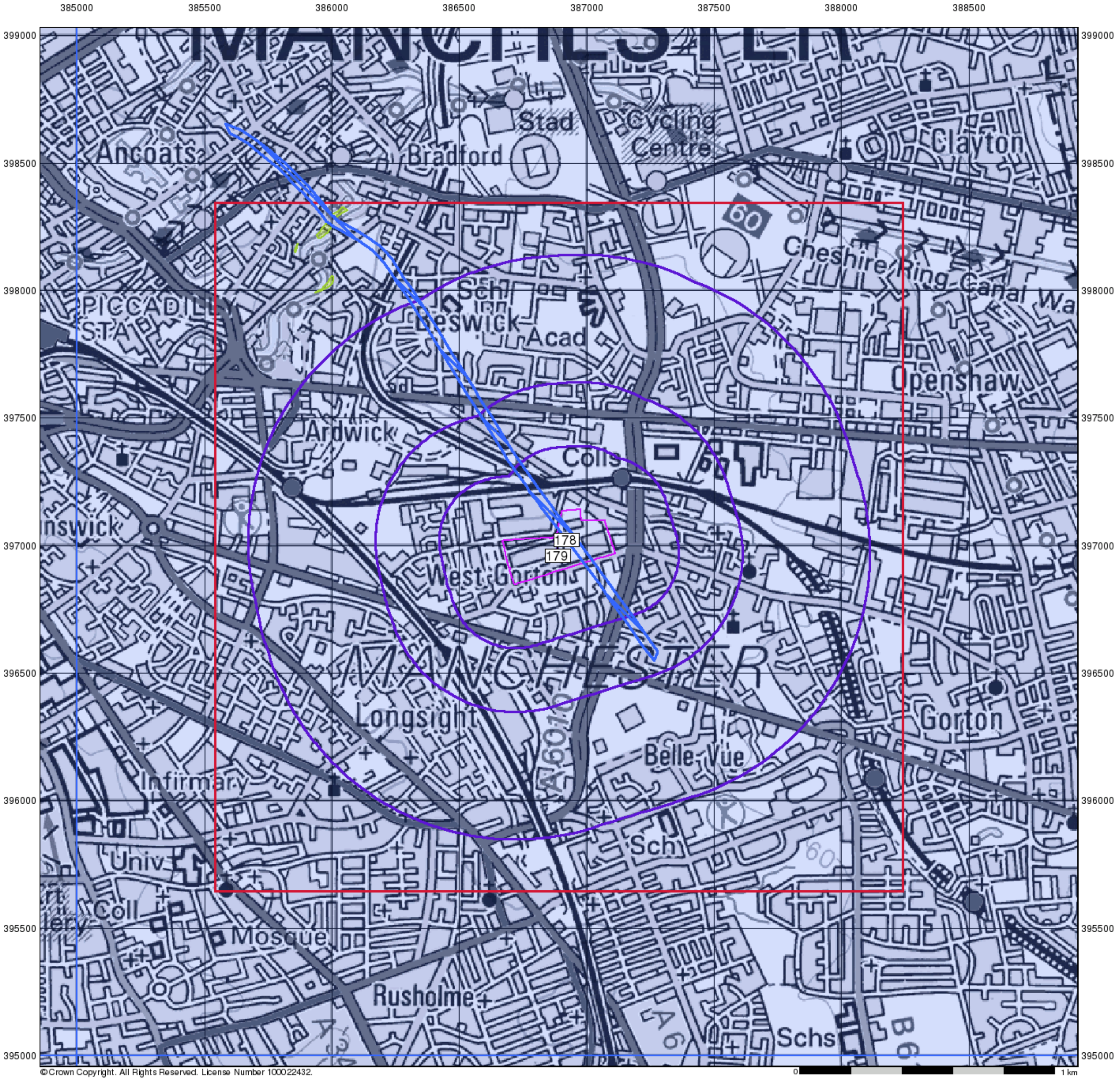
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Ancoats
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Cycling Centre
Bradford
Clayton
Cheshire Ring Canal
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Beswick
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Ardwick
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West Gorton
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Longsight
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Belle Vue
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**Envirocheck®**
Mining

# Ground Stability Data (1:50,000)

## General

Specified Site
Specified Buffer(s)
X Bearing Reference Point
☐ Slice
8 Map ID

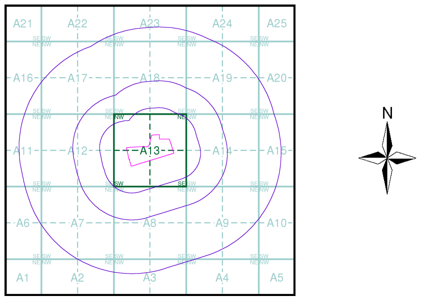
## Potential for Landslide Ground Stability Hazards

| | | | |
|---|---|---|---|
| 🟥 | High | 🟩 | Low |
| 🟧 | Moderate | 🟦 | Very Low |

## Potential for Ground Dissolution Stability Hazards

| | | | |
|---|---|---|---|
| ▨ | High | ▨ | Low |
| ▨ | Moderate | ▨ | Very Low |

## Mining and Ground Stability - Slice A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## Order Details

| | |
|---|---|
| Order Number: | 73720566_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

**Landmark®**
Information Group

Tel: 0844 844 9952
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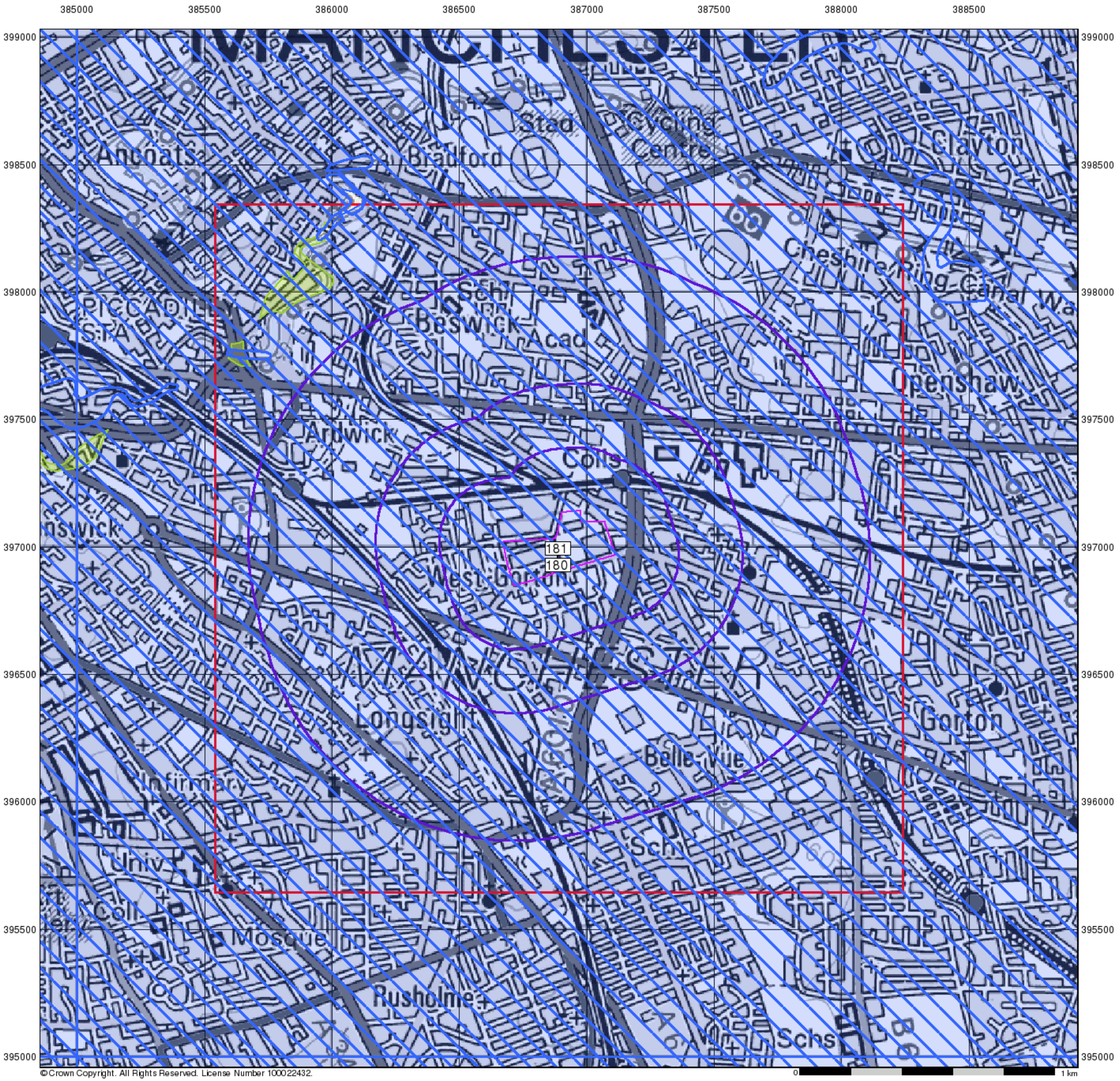
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Cycling Centre
Clayton
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Openshaw
Ardwick
Coll
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West Gorton
Manchester
Longsight
Belle Vue
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**Envirocheck® Mining**

# Ground Stability Data (1:50,000)

## General

Specified Site
Specified Buffer(s)
X Bearing Reference Point
☐ Slice
8 Map ID

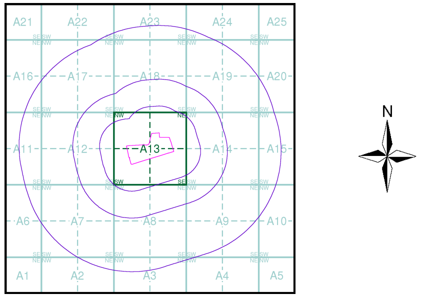
## Potential for Running Sand Ground Stability Hazards

🟥 High
🟧 Moderate
🟩 Low
🟦 Very Low

## Potential for Shrinking or Swelling Clay Ground Stability Hazards

▨ High
▨ Moderate
▨ Low
▨ Very Low

## Mining and Ground Stability - Slice A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## Order Details

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| Order Number: | 73720566_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 386930, 397100

# Envirocheck® Report:

# Mining and Ground Stability Datasheet

## Order Details:

**Order Number:**
73720566_1_1

**Customer Reference:**
2913

**National Grid Reference:**
386890, 396990

**Slice:**
A

**Site Area (Ha):**
6.84

**Search Buffer (m):**
1000

## Site Details:

Site at 386930, 397100

## Client Details:

MR J Henning
Integra Consulting (Environmental) Ltd
Suite 3
14-32 Hewitt Street
Manchester
M15 4GB

# 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)** | **5** |
| 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)** | **6** |
| 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)** | **13** |
| 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)** | **14** |
| 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** | **21** |
| 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** | **22** |
| **Data Suppliers** | **24** |
| **Useful Contacts** | **25** |

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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**

# 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 | pg 1 | | | 2 | 13 |
| Coal Mining Affected Areas | pg 3 | Yes | n/a | n/a | n/a |
| Man Made Mining Cavities | pg 3 | | | | 1 |
| Mining Instability | pg 3 | Yes | n/a | n/a | n/a |
| Natural Cavities | | | | | |
| Non Coal Mining Areas of Great Britain | pg 3 | | Yes | n/a | n/a |
| Potential Mining Areas | pg 3 | 3 | 1 | | 3 |
| **Historical Land Use Information (1:2,500)** | | | | | |
| Extractive Industries or Potential Excavations from 1855-1909 (100m) | pg 5 | 1 | 2 | n/a | n/a |
| Extractive Industries or Potential Excavations from 1893-1915 (100m) | pg 5 | 2 | 4 | 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 5 | | 1 | n/a | n/a |
| Subterranean Features (100m) | | | | n/a | n/a |
| **Historical Land Use Information (1:10,000)** | | | | | |
| Air Shafts | | | | | |
| Disturbed Ground | | | | | |
| General Quarrying | | | | | |
| Heap, unknown constituents | pg 6 | | | 1 | |
| Mineral Railway | pg 6 | | | | 2 |
| Mining & quarrying general | pg 6 | | | | 2 |
| Mining of coal & lignite | pg 6 | | | | 1 |
| Quarrying of sand & clay, operation of sand & gravel pits | pg 6 | | | 1 | 1 |
| Former Marshes | | | | | |
| Potentially Infilled Land (Non-Water) | pg 6 | | 2 | 4 | 8 |
| Potentially Infilled Land (Water) | pg 7 | 5 | 21 | 28 | 68 |

| 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 13 | Yes | | n/a | n/a |
| Potential for Compressible Ground Stability Hazards | pg 13 | Yes | Yes | n/a | n/a |
| Potential for Ground Dissolution Stability Hazards | pg 13 | Yes | | n/a | n/a |
| Potential for Landslide Ground Stability Hazards | pg 13 | Yes | | n/a | n/a |
| Potential for Running Sand Ground Stability Hazards | pg 13 | Yes | | n/a | n/a |
| Potential for Shrinking or Swelling Clay Ground Stability Hazards | pg 13 | Yes | | n/a | n/a |
| Salt Mining Related Features | | | | | |
| Subsidence Insurance Claims | pg 13 | | 1 | n/a | n/a |
| Subsidence Investigations | | | | n/a | n/a |
| **Motion Map Data (1:2,500)** | | | | | |
| Motion Map (100m) | pg 14 | 57 | 82 | n/a | n/a |

**Report Version v50.0**

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Recorded Mineral Sites** | | | | |
| 1 | Site Name: Gorton Fire Brick Works<br>Location: Ashton Old Road, Gorton, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29590<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Fireclay<br>Positional Accuracy: Located by supplier to within 10m | A19SW<br>(NE) | 371 | 1 | 387255<br>397420 |
| | **BGS Recorded Mineral Sites** | | | | |
| 2 | Site Name: Ardwick Brick Field<br>Location: Ashton Old Road, Ardwick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29588<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A17SE<br>(NW) | 468 | 1 | 386450<br>397430 |
| | **BGS Recorded Mineral Sites** | | | | |
| 3 | Site Name: Beswick Brick Field<br>Location: , Beswick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29586<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A18SW<br>(N) | 505 | 1 | 386780<br>397625 |
| | **BGS Recorded Mineral Sites** | | | | |
| 4 | Site Name: Steels Buildings Clay Pit<br>Location: Ashton Old Road, Ardwick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29589<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A19SW<br>(NE) | 573 | 1 | 387328<br>397610 |
| | **BGS Recorded Mineral Sites** | | | | |
| 5 | Site Name: Beswick Brick Field<br>Location: , Beswick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29585<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A18NW<br>(N) | 649 | 1 | 386635<br>397725 |
| | **BGS Recorded Mineral Sites** | | | | |
| 6 | Site Name: Ardwick Lime Works Pit<br>Location: Ashton Old Road, Ardwick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29580<br>Type: Underground<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Carboniferous<br>Geology: Great Mine Limestone<br>Commodity: Limestone<br>Positional Accuracy: Located by supplier to within 10m | A17SE<br>(NW) | 670 | 1 | 386340<br>397600 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 6 | **BGS Recorded Mineral Sites**<br>Site Name: Ashton Road Brick Field<br>Location: Ahston Old Road, Ardwick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29593<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A17SE<br>(NW) | 705 | 1 | 386305<br>397620 |
| 7 | **BGS Recorded Mineral Sites**<br>Site Name: Ashbury Rail Depot<br>Location: Bessemer Street, West Gorton, Manchester, M11 2nw<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 16865<br>Type: Rail Depot<br>**Status: Active**<br>Operator: Hope Construction Materials<br>Operator Location: Hope Construction Materials, Berkeley House, 3rd Floor, Berkeley Square, Mayfair, London, W1j 6bu<br>Periodic Type: Carboniferous<br>Geology: Carboniferous Limestone<br>Commodity: Crushed Rock<br>Positional Accuracy: Located by supplier to within 10m | A14NE<br>(E) | 716 | 1 | 387794<br>397181 |
| 8 | **BGS Recorded Mineral Sites**<br>Site Name: Ardwick Brick Field<br>Location: Ashton Old Road, Ardwick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29587<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A17SW<br>(NW) | 725 | 1 | 386130<br>397500 |
| 9 | **BGS Recorded Mineral Sites**<br>Site Name: Ardwick Lime Works Pits<br>Location: Bellew Street, Ardwick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29599<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Carboniferous<br>Geology: Great Mine Limestone<br>Commodity: Limestone<br>Positional Accuracy: Located by supplier to within 10m | A17NE<br>(NW) | 754 | 1 | 386295<br>397670 |
| 10 | **BGS Recorded Mineral Sites**<br>Site Name: Beswick Brick Field<br>Location: , Beswick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29584<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A17NE<br>(NW) | 769 | 1 | 386450<br>397755 |
| 11 | **BGS Recorded Mineral Sites**<br>Site Name: Beswick Brick Field<br>Location: , Beswick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29583<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A17NE<br>(NW) | 826 | 1 | 386280<br>397745 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 12 | **BGS Recorded Mineral Sites**<br>Site Name: North Street Brick Works<br>Location: , Openshaw, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29594<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A19SE<br>(NE) | 924 | 1 | 387805<br>397660 |
| 13 | **BGS Recorded Mineral Sites**<br>Site Name: Ardwick Lime Works Pits<br>Location: Ferry Street, Ardwick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29598<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Carboniferous<br>Geology: Great Mine Limestone<br>Commodity: Limestone<br>Positional Accuracy: Located by supplier to within 10m | A17NW<br>(NW) | 930 | 1 | 386170<br>397800 |
| 14 | **BGS Recorded Mineral Sites**<br>Site Name: Beswick Brick Field<br>Location: , Beswick, Manchester<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 29582<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Unknown Operator<br>Periodic Type: Quaternary<br>Geology: Till, Devensian<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m | A17NE<br>(NW) | 933 | 1 | 386250<br>397850 |
|  | **Coal Mining Affected Areas**<br>Description: In an area which may be affected by coal mining activity. It is recommended that a coal mining report is obtained from the Coal Authority. Contact details are included in the Useful Contacts section of this report. | A13SW<br>(NE) | 0 | 2 | 386885<br>396992 |
|  | **Man Made Mining Cavities**<br>Cavity Type: Not supplied<br>Commodity: Limestone<br>Solid Geology Detail: Carboniferous Coal Measures<br>Superficial Geology Detail: Glacial Till | A18NE<br>(N) | 860 | 3 | 387000<br>398000 |
|  | **Mining Instability**<br>Mining Evidence: Inconclusive Coal Mining<br>Source: Ove Arup & Partners<br>Boundary Quality: As Supplied | A13SW<br>(NE) | 0 | 4 | 386885<br>396992 |
|  | **Mining Instability**<br>Mining Evidence: Conclusive Rock Mining<br>Source: Ove Arup & Partners<br>Boundary Quality: As Supplied | A13SW<br>(NE) | 0 | 4 | 386885<br>396992 |
|  | **Non Coal Mining Areas of Great Britain**<br>Risk: Rare<br>Source: British Geological Survey, National Geoscience Information Service | A13NE<br>(NE) | 49 | 1 | 387089<br>397156 |
|  | **Non Coal Mining Areas of Great Britain**<br>Risk: Likely<br>Source: British Geological Survey, National Geoscience Information Service | A13NW<br>(NW) | 196 | 1 | 386600<br>397200 |
| 15 | **Potential Mining Areas**<br>Name: Clayton<br>Ceased Operation: 1878<br>Commodity: Coal; Four Feet; Two Feet; Yard<br>Reference: 989<br>Alternate Name/Mine: Not Supplied<br>Custodian: Not Supplied | A13NW<br>(N) | 0 | 5 | 386886<br>397071 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 16 | **Potential Mining Areas**<br>Name: Bradford and Clayton<br>Ceased Operation: 1891<br>Commodity: Coal; Four Foot<br>Reference: 2655<br>Alternate Name/Mine: Forge<br>Custodian: Not Supplied | A13SW<br>(NE) | 0 | 5 | 386885<br>396992 |
| 17 | **Potential Mining Areas**<br>Name: Bradford<br>Ceased Operation: 1935<br>Commodity: Coal; Parket<br>Reference: 11471<br>Alternate Name/Mine: Not Supplied<br>Custodian: Not Supplied | A13NW<br>(N) | 0 | 5 | 386886<br>397071 |
| 18 | **Potential Mining Areas**<br>Name: Ardwick<br>Ceased Operation: 1888<br>Commodity: Limestone; Great<br>Reference: 3963<br>Alternate Name/Mine: Not Supplied<br>Custodian: Not Supplied | A13NW<br>(NW) | 42 | 5 | 386839<br>397071 |
| 19 | **Potential Mining Areas**<br>Name: Manchester (District)<br>Ceased Operation: 1877-1883<br>Commodity: Limestone<br>Reference: Not Supplied<br>Alternate Name/Mine: Not Supplied<br>Custodian: (i) Divisional Engineers Office, L.M.S. Railway Company, Ltd., Hunts Bank, Manchester. (ii) Winstanley and Ashworth, 42 Deansgate, Manchester. | A17SE<br>(NW) | 514 | 5 | 386440<br>397477 |
| 20 | **Potential Mining Areas**<br>Name: Bradford<br>Ceased Operation: 1905<br>Commodity: Fireclay<br>Reference: 4817<br>Alternate Name/Mine: Not Supplied<br>Custodian: Not Supplied | A19NW<br>(N) | 781 | 5 | 387248<br>397872 |
| 21 | **Potential Mining Areas**<br>Name: Bradford<br>Ceased Operation: 1891<br>Commodity: Coal; Three Quarters; Four Feet<br>Reference: 2636<br>Alternate Name/Mine: Not Supplied<br>Custodian: Not Supplied | A17NE<br>(NW) | 875 | 5 | 386444<br>397879 |

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

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 22 | **Extractive Industries or Potential Excavations from 1855-1909**<br>Use: Reservoir<br>First Map Published Date: 1893<br>Last Map Published Date: 1893 | A13NW<br>(W) | 0 | - | 386862<br>396996 |
| 23 | **Extractive Industries or Potential Excavations from 1855-1909**<br>Use: Unspecified Pit<br>First Map Published Date: 1893<br>Last Map Published Date: Not Applicable | A13NW<br>(W) | 17 | - | 386657<br>396997 |
| 24 | **Extractive Industries or Potential Excavations from 1855-1909**<br>Use: Brick Field<br>First Map Published Date: 1893<br>Last Map Published Date: 1893 | A13NW<br>(N) | 58 | - | 386834<br>397131 |
| 25 | **Extractive Industries or Potential Excavations from 1893-1915**<br>Use: Reservoir<br>First Map Published Date: 1908<br>Last Map Published Date: 1908 | A13NW<br>(W) | 0 | - | 386864<br>396997 |
| 26 | **Extractive Industries or Potential Excavations from 1893-1915**<br>Use: Unspecified Deposited Material<br>First Map Published Date: 1908<br>Last Map Published Date: Not Applicable | A13NE<br>(NE) | 0 | - | 386990<br>397044 |
| 27 | **Extractive Industries or Potential Excavations from 1893-1915**<br>Use: Raven Slate Works<br>First Map Published Date: 1908<br>Last Map Published Date: 1908 | A13NW<br>(N) | 10 | - | 386866<br>397042 |
| 28 | **Extractive Industries or Potential Excavations from 1893-1915**<br>Use: Brick Field<br>First Map Published Date: 1908<br>Last Map Published Date: 1908 | A13NW<br>(W) | 10 | - | 386776<br>397036 |
| 29 | **Extractive Industries or Potential Excavations from 1893-1915**<br>Use: Unspecified Pit<br>First Map Published Date: 1908<br>Last Map Published Date: Not Applicable | A13NW<br>(NW) | 75 | - | 386765<br>397111 |
| 30 | **Extractive Industries or Potential Excavations from 1893-1915**<br>Use: Unspecified Pit<br>First Map Published Date: 1908<br>Last Map Published Date: Not Applicable | A13NE<br>(NE) | 93 | - | 387082<br>397190 |
| 31 | **Extractive Industries or Potential Excavations from 1950-1980**<br>Use: Refuse Heap<br>First Map Published Date: 1948<br>Last Map Published Date: N/A | A13NE<br>(NE) | 11 | - | 387086<br>397084 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 32 | **Heap, unknown constituents**<br>Use: Not Supplied<br>Date of Mapping: 1956 | A14NW<br>(NE) | 498 | - | 387533<br>397286 |
| 33 | **Mineral Railway**<br>Use: Not Supplied<br>Date of Mapping: 1895 - 1923 | A8NE<br>(SE) | 555 | - | 387203<br>396404 |
| 34 | **Mineral Railway**<br>Use: Not Supplied<br>Date of Mapping: 1848 | A17SE<br>(NW) | 662 | - | 386364<br>397603 |
| 35 | **Mining & quarrying general**<br>Use: Not Supplied<br>Date of Mapping: 1848 | A17SE<br>(NW) | 656 | - | 386379<br>397605 |
| 36 | **Mining & quarrying general**<br>Use: Not Supplied<br>Date of Mapping: 1848 | A17NW<br>(NW) | 894 | - | 386171<br>397757 |
| 37 | **Mining of coal & lignite**<br>Use: Not Supplied<br>Date of Mapping: 1848 | A19NW<br>(NE) | 934 | - | 387416<br>397966 |
| 38 | **Quarrying of sand & clay, operation of sand & gravel pits**<br>Use: Not Supplied<br>Date of Mapping: 1848 | A19SW<br>(NE) | 377 | - | 387278<br>397413 |
| 39 | **Quarrying of sand & clay, operation of sand & gravel pits**<br>Use: Not Supplied<br>Date of Mapping: 1848 | A19SW<br>(NE) | 540 | - | 387323<br>397576 |
| 40 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A13NW<br>(N) | 15 | - | 386868<br>397140 |
| 41 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A13NW<br>(NW) | 76 | - | 386806<br>397130 |
| 42 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A19SW<br>(NE) | 377 | - | 387278<br>397413 |
| 43 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A18SW<br>(N) | 412 | - | 386850<br>397543 |
| 44 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A19SW<br>(NE) | 419 | - | 387321<br>397434 |
| 45 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A17SE<br>(NW) | 443 | - | 386543<br>397442 |
| 46 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A19SW<br>(NE) | 540 | - | 387323<br>397576 |
| 47 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A17SE<br>(NW) | 656 | - | 386379<br>397605 |
| 48 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A17SE<br>(NW) | 681 | - | 386333<br>397609 |
| 49 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A17SW<br>(W) | 778 | - | 385973<br>397361 |
| 50 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A19NE<br>(NE) | 857 | - | 387698<br>397683 |
| 51 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A17NW<br>(NW) | 894 | - | 386171<br>397757 |
| 52 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A19NW<br>(NE) | 934 | - | 387416<br>397966 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 53 | **Potentially Infilled Land (Non-Water)**<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1993 | A17NW<br>(NW) | 999 | - | 386080<br>397823 |
| 54 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A13NE<br>(N) | 0 | - | 386922<br>397115 |
| 55 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13SE<br>(SE) | 0 | - | 386984<br>396936 |
| 56 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13SE<br>(E) | 0 | - | 386980<br>396964 |
| 57 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13NE<br>(E) | 0 | - | 387001<br>397011 |
| 58 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A13NE<br>(N) | 0 | - | 386896<br>397048 |
| 59 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1956 | A13NE<br>(NE) | 1 | - | 387075<br>397086 |
| 60 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A13NW<br>(W) | 32 | - | 386641<br>397028 |
| 61 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A13NW<br>(NW) | 33 | - | 386779<br>397069 |
| 62 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A13NW<br>(W) | 33 | - | 386663<br>397052 |
| 63 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13SE<br>(E) | 33 | - | 387092<br>396928 |
| 64 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13SE<br>(SE) | 42 | - | 386999<br>396889 |
| 65 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13SE<br>(S) | 60 | - | 386908<br>396843 |
| 66 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A13NW<br>(W) | 64 | - | 386619<br>397055 |
| 67 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13SE<br>(E) | 80 | - | 387174<br>396920 |
| 68 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A13NW<br>(NW) | 87 | - | 386644<br>397101 |
| 69 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13SE<br>(S) | 90 | - | 386926<br>396817 |
| 70 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A13NE<br>(NE) | 114 | - | 387102<br>397207 |
| 71 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13SE<br>(SE) | 116 | - | 387037<br>396823 |
| 72 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12NE<br>(W) | 126 | - | 386549<br>397045 |
| 73 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A13NE<br>(NE) | 130 | - | 387127<br>397215 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 74 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A13NW<br>(NW) | 157 | - | 386689<br>397198 |
| 75 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SE<br>(W) | 174 | - | 386531<br>396849 |
| 76 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SE<br>(SW) | 192 | - | 386522<br>396823 |
| 77 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12NE<br>(W) | 211 | - | 386498<br>397139 |
| 78 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13NE<br>(NE) | 220 | - | 387187<br>397285 |
| 79 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A18SW<br>(N) | 245 | - | 386881<br>397379 |
| 80 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14NW<br>(E) | 266 | - | 387337<br>397135 |
| 81 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8NW<br>(SW) | 296 | - | 386696<br>396553 |
| 82 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8NW<br>(S) | 300 | - | 386798<br>396558 |
| 83 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A13NW<br>(NW) | 305 | - | 386562<br>397320 |
| 84 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14SW<br>(SE) | 326 | - | 387366<br>396765 |
| 85 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14SW<br>(SE) | 331 | - | 387382<br>396779 |
| 86 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12NE<br>(W) | 336 | - | 386388<br>397198 |
| 87 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A18SE<br>(N) | 342 | - | 387011<br>397480 |
| 88 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14NW<br>(NE) | 342 | - | 387331<br>397320 |
| 89 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SE<br>(W) | 343 | - | 386359<br>396837 |
| 90 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SE<br>(SW) | 350 | - | 386374<br>396765 |
| 91 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8NE<br>(S) | 377 | - | 387046<br>396554 |
| 92 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8NW<br>(S) | 379 | - | 386834<br>396486 |
| 93 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SE<br>(W) | 382 | - | 386338<br>396773 |
| 94 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SE<br>(W) | 407 | - | 386308<br>396782 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 95 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A12NE<br>(W) | 411 | - | 386260<br>397046 |
| 96 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7NE<br>(SW) | 413 | - | 386547<br>396473 |
| 97 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A19SW<br>(NE) | 438 | - | 387405<br>397382 |
| 98 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SE<br>(W) | 440 | - | 386256<br>396854 |
| 99 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9NW<br>(SE) | 442 | - | 387381<br>396618 |
| 100 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A19SW<br>(NE) | 447 | - | 387373<br>397428 |
| 101 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SE<br>(W) | 453 | - | 386239<br>396873 |
| 102 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8NE<br>(S) | 456 | - | 386999<br>396456 |
| 103 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9NW<br>(SE) | 458 | - | 387229<br>396526 |
| 104 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8NE<br>(S) | 458 | - | 387049<br>396470 |
| 105 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8NW<br>(S) | 469 | - | 386804<br>396386 |
| 106 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8NE<br>(S) | 483 | - | 387014<br>396433 |
| 107 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A18SE<br>(N) | 489 | - | 387115<br>397609 |
| 108 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8NE<br>(S) | 506 | - | 386933<br>396384 |
| 109 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A18SW<br>(NW) | 507 | - | 386603<br>397543 |
| 110 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SW<br>(W) | 508 | - | 386169<br>396941 |
| 111 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12NW<br>(W) | 514 | - | 386162<br>397091 |
| 112 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A17SE<br>(NW) | 518 | - | 386549<br>397521 |
| 113 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A19SW<br>(NE) | 518 | - | 387244<br>397586 |
| 114 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7NE<br>(SW) | 528 | - | 386379<br>396443 |
| 115 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8SW<br>(S) | 538 | - | 386739<br>396310 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 116 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SW<br>(W) | 541 | - | 386159<br>396828 |
| 117 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14NE<br>(E) | 555 | - | 387659<br>397052 |
| 118 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A19SW<br>(NE) | 562 | - | 387317<br>397604 |
| 119 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A9NE<br>(SE) | 587 | - | 387605<br>396652 |
| 120 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A19SE<br>(NE) | 591 | - | 387591<br>397381 |
| 121 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12NW<br>(W) | 624 | - | 386047<br>397017 |
| 122 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9NE<br>(SE) | 626 | - | 387572<br>396546 |
| 123 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8SE<br>(S) | 627 | - | 387052<br>396294 |
| 124 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9NW<br>(SE) | 645 | - | 387376<br>396380 |
| 125 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A9NE<br>(SE) | 649 | - | 387567<br>396506 |
| 126 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A19SE<br>(NE) | 659 | - | 387674<br>397364 |
| 127 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A19NW<br>(NE) | 675 | - | 387344<br>397715 |
| 128 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14SE<br>(E) | 682 | - | 387792<br>396962 |
| 129 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A18NW<br>(N) | 693 | - | 386833<br>397825 |
| 130 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7NW<br>(SW) | 700 | - | 386209<br>396367 |
| 131 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7SE<br>(SW) | 709 | - | 386246<br>396319 |
| 132 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A18NE<br>(N) | 716 | - | 387215<br>397815 |
| 133 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A17SW<br>(NW) | 728 | - | 386054<br>397403 |
| 134 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A12SW<br>(W) | 730 | - | 385998<br>396689 |
| 135 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8SW<br>(S) | 733 | - | 386638<br>396120 |
| 136 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1923 | A19NW<br>(NE) | 742 | - | 387537<br>397675 |

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

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 137 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7SW<br>(SW) | 759 | - | 386212<br>396282 |
| 138 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7NW<br>(SW) | 762 | - | 386123<br>396371 |
| 139 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9NE<br>(SE) | 763 | - | 387770<br>396585 |
| 140 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8SE<br>(S) | 767 | - | 386913<br>396105 |
| 141 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14SE<br>(E) | 778 | - | 387887<br>396913 |
| 142 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9NE<br>(SE) | 778 | - | 387771<br>396556 |
| 143 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7NW<br>(SW) | 784 | - | 386094<br>396372 |
| 144 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7SW<br>(SW) | 784 | - | 386195<br>396264 |
| 145 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A17NE<br>(NW) | 788 | - | 386243<br>397679 |
| 146 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8SE<br>(SE) | 792 | - | 387225<br>396174 |
| 147 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1956 | A15SW<br>(E) | 800 | - | 387909<br>396918 |
| 148 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A8SE<br>(S) | 804 | - | 387080<br>396117 |
| 149 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A18NW<br>(N) | 806 | - | 386622<br>397889 |
| 150 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A14NE<br>(E) | 809 | - | 387859<br>397286 |
| 151 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9NE<br>(E) | 834 | - | 387868<br>396619 |
| 152 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A9SW<br>(SE) | 843 | - | 387311<br>396147 |
| 153 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1956 | A9SW<br>(SE) | 846 | - | 387256<br>396128 |
| 154 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A18NW<br>(N) | 866 | - | 386685<br>397973 |
| 155 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8SE<br>(S) | 867 | - | 387211<br>396092 |
| 156 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A19NW<br>(NE) | 875 | - | 387291<br>397956 |
| 157 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9NE<br>(SE) | 890 | - | 387901<br>396559 |

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

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 158 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9NE<br>(SE) | 895 | - | 387874<br>396501 |
| 159 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9SW<br>(SE) | 896 | - | 387313<br>396093 |
| 160 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A15NW<br>(E) | 906 | - | 387972<br>397248 |
| 161 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A17SW<br>(NW) | 907 | - | 385906<br>397505 |
| 162 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1956 | A9SE<br>(SE) | 911 | - | 387699<br>396269 |
| 163 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1895 | A10NW<br>(E) | 912 | - | 387965<br>396647 |
| 164 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9SW<br>(SE) | 913 | - | 387524<br>396154 |
| 165 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7SW<br>(SW) | 915 | - | 385977<br>396309 |
| 166 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1956 | A9SW<br>(SE) | 915 | - | 387498<br>396139 |
| 167 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A8SE<br>(S) | 916 | - | 387054<br>395992 |
| 168 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A23SW<br>(N) | 929 | - | 386877<br>398065 |
| 169 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A7SW<br>(SW) | 937 | - | 385973<br>396280 |
| 170 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A15SW<br>(E) | 939 | - | 388045<br>396879 |
| 171 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A9SW<br>(SE) | 949 | - | 387464<br>396088 |
| 172 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1956 | A9SE<br>(SE) | 983 | - | 387632<br>396135 |
| 173 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A15NW<br>(E) | 984 | - | 388028<br>397329 |
| 174 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1848 | A23SW<br>(N) | 987 | - | 386576<br>398066 |
| 175 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909 | A19NE<br>(NE) | 996 | - | 387793<br>397785 |

# 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. | | | | |
| 176 | **Potential for Collapsible Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SW<br>(NE) | 0 | 1 | 386885<br>396992 |
| 177 | **Potential for Compressible Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13NW<br>(N) | 97 | 1 | 386889<br>397233 |
| | **Potential for Compressible Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13SW<br>(NE) | 0 | 1 | 386885<br>396992 |
| 178 | **Potential for Ground Dissolution Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13NE<br>(NE) | 0 | 1 | 386921<br>397020 |
| | **Potential for Ground Dissolution Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13SW<br>(NE) | 0 | 1 | 386885<br>396992 |
| 179 | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SW<br>(NE) | 0 | 1 | 386885<br>396992 |
| 180 | **Potential for Running Sand Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SW<br>(NE) | 0 | 1 | 386885<br>396992 |
| 181 | **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SW<br>(NE) | 0 | 1 | 386885<br>396992 |
| | **Subsidence Insurance Claims**<br>Case Date: 25th June 2007<br>Movement Trend Indication: No significant movement (< 0.50mm)<br>Damage Classification: Not Supplied | | | - | |

# Motion Map Data (1:2,500)

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 182 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.5 | A13SE (E) | 0 | - | 387100 396976 |
| 182 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.5 | A13SE (E) | 0 | - | 387097 396976 |
| 182 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.2 | A13SE (E) | 0 | - | 387099 396972 |
| 183 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.5 | A13SE (E) | 0 | - | 387053 396987 |
| 183 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.0 | A13SE (E) | 0 | - | 387051 396983 |
| 183 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.1 | A13SE (E) | 0 | - | 387050 396979 |
| 184 | **Motion Map**<br>Average Velocity Gradient (mmyear): 2.3 | A13SE (E) | 0 | - | 387105 396971 |
| 185 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.7 | A13SE (E) | 0 | - | 387095 396973 |
| 186 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.5 | A13SW (W) | 0 | - | 386718 396978 |
| 187 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.0 | A13SW (W) | 0 | - | 386679 396988 |
| 187 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.9 | A13NW (W) | 0 | - | 386678 396996 |
| 187 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.6 | A13NW (W) | 0 | - | 386675 396997 |
| 187 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.8 | A13SW (W) | 1 | - | 386678 396984 |
| 187 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.8 | A13SW (W) | 2 | - | 386676 396989 |
| 187 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.8 | A13SW (W) | 3 | - | 386675 396985 |
| 188 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.9 | A13NW (NW) | 0 | - | 386838 397028 |
| 188 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.8 | A13NW (NW) | 1 | - | 386834 397029 |
| 188 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.9 | A13NW (NW) | 3 | - | 386842 397032 |
| 188 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.1 | A13NW (NW) | 5 | - | 386835 397033 |
| 189 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.6 | A13NE (N) | 0 | - | 386898 397035 |

# Motion Map Data (1:2,500)

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 190 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.3 | A13SW (SW) | 0 | - | 386855 396927 |
| 190 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.8 | A13SW (SW) | 0 | - | 386853 396927 |
| 190 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.1 | A13SW (SW) | 0 | - | 386850 396924 |
| 191 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.5 | A13SW (SW) | 0 | - | 386803 396898 |
| 191 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.2 | A13SW (SW) | 0 | - | 386798 396899 |
| 191 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.3 | A13SW (SW) | 0 | - | 386796 396895 |
| 191 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.0 | A13SW (SW) | 0 | - | 386797 396891 |
| 192 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.9 | A13NE (E) | 0 | - | 387082 397041 |
| 192 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.2 | A13NE (E) | 0 | - | 387086 397044 |
| 193 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.1 | A13NE (E) | 0 | - | 387058 397046 |
| 193 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.3 | A13NE (E) | 0 | - | 387066 397053 |
| 193 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.2 | A13NE (E) | 0 | - | 387062 397050 |
| 194 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.1 | A13SE (E) | 0 | - | 387054 396974 |
| 194 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.0 | A13SE (E) | 0 | - | 387053 396974 |
| 194 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.6 | A13SE (E) | 0 | - | 387055 396970 |
| 194 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.9 | A13SE (E) | 0 | - | 387055 396970 |
| 195 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.0 | A13SW (SW) | 0 | - | 386816 396928 |
| 195 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.1 | A13SW (SW) | 0 | - | 386814 396928 |
| 196 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.6 | A13SW (SW) | 0 | - | 386799 396895 |
| 197 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.0 | A13NE (E) | 0 | - | 387072 397035 |

# Motion Map Data (1:2,500)

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 198 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.3 | A13NW (W) | 0 | - | 386674 397018 |
| 199 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.1 | A13SW (SW) | 0 | - | 386796 396887 |
| 199 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.8 | A13SW (SW) | 0 | - | 386797 396883 |
| 199 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.6 | A13SW (SW) | 0 | - | 386794 396880 |
| 200 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.4 | A13SW (SW) | 0 | - | 386771 396934 |
| 201 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.2 | A13NE (E) | 0 | - | 387060 397034 |
| 202 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.0 | A13NE (N) | 0 | - | 386901 397111 |
| 203 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.8 | A13SE (E) | 0 | - | 387044 396960 |
| 204 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.4 | A13SW (W) | 0 | - | 386737 396991 |
| 204 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.3 | A13SW (W) | 0 | - | 386735 396987 |
| 205 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.7 | A13SW (SW) | 0 | - | 386795 396875 |
| 206 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.2 | A13SE (E) | 0 | - | 387029 396960 |
| 206 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.2 | A13SE (E) | 0 | - | 387025 396961 |
| 206 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.9 | A13SE (E) | 0 | - | 387028 396956 |
| 206 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.1 | A13SE (E) | 0 | - | 387023 396957 |
| 206 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.2 | A13SE (E) | 0 | - | 387029 396951 |
| 207 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.9 | A13NE (E) | 0 | - | 387083 397053 |
| 207 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.8 | A13NE (E) | 0 | - | 387083 397045 |
| 207 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.6 | A13NE (E) | 1 | - | 387086 397048 |
| 208 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.3 | A13NE (E) | 0 | - | 387007 397026 |

# Motion Map Data (1:2,500)

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 209 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.2 | A13SW<br>(SW) | 0 | - | 386822<br>396902 |
| 210 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.7 | A13SW<br>(SW) | 0 | - | 386798<br>396907 |
| 211 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.4 | A13NE<br>(E) | 0 | - | 387049<br>397012 |
| 211 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.3 | A13NE<br>(E) | 0 | - | 387046<br>397013 |
| 212 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.0 | A13SW<br>(SW) | 13 | - | 386696<br>396862 |
| 212 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.2 | A13SW<br>(SW) | 15 | - | 386695<br>396862 |
| 212 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.7 | A13SW<br>(SW) | 16 | - | 386695<br>396858 |
| 212 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.1 | A13SW<br>(SW) | 17 | - | 386691<br>396867 |
| 213 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.0 | A13SE<br>(S) | 22 | - | 386899<br>396880 |
| 213 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.9 | A13SE<br>(S) | 23 | - | 386901<br>396879 |
| 214 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.2 | A13SE<br>(SE) | 23 | - | 387029<br>396919 |
| 215 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.0 | A13SW<br>(SW) | 27 | - | 386685<br>396852 |
| 215 | **Motion Map**<br>Average Velocity Gradient (mmyear): -0.8 | A13SW<br>(SW) | 28 | - | 386687<br>396843 |
| 215 | **Motion Map**<br>Average Velocity Gradient (mmyear): -1.4 | A13SW<br>(SW) | 33 | - | 386683<br>396840 |
| 216 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.2 | A13SE<br>(SE) | 31 | - | 386969<br>396892 |
| 217 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.4 | A13SE<br>(E) | 32 | - | 387099<br>396931 |
| 217 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.0 | A13SE<br>(E) | 34 | - | 387104<br>396930 |
| 217 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.1 | A13SE<br>(E) | 37 | - | 387102<br>396927 |
| 218 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.3 | A13SE<br>(SE) | 33 | - | 386989<br>396896 |
| 218 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.1 | A13SE<br>(SE) | 37 | - | 386995<br>396894 |

# Motion Map Data (1:2,500)

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 218 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.7 | A13SE (SE) | 38 | - | 386990 396891 |
| 219 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.2 | A13SW (S) | 33 | - | 386844 396852 |
| 219 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.0 | A13SW (S) | 35 | - | 386848 396851 |
| 220 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.7 | A13SE (SE) | 36 | - | 386985 396892 |
| 221 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.3 | A13SW (S) | 36 | - | 386866 396855 |
| 222 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.6 | A13NW (N) | 36 | - | 386874 397154 |
| 223 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.3 | A13SE (E) | 40 | - | 387085 396918 |
| 223 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.3 | A13SE (E) | 43 | - | 387083 396914 |
| 224 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.6 | A13NE (E) | 43 | - | 387126 397063 |
| 225 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.5 | A13SE (E) | 45 | - | 387154 396979 |
| 226 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.7 | A13SW (SW) | 46 | - | 386816 396830 |
| 226 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.6 | A13SW (S) | 47 | - | 386818 396829 |
| 226 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.6 | A13SW (S) | 50 | - | 386817 396826 |
| 226 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.2 | A13SW (S) | 51 | - | 386818 396825 |
| 227 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.4 | A13SE (SE) | 49 | - | 386974 396874 |
| 227 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.0 | A13SE (SE) | 50 | - | 386976 396874 |
| 227 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.4 | A13SE (SE) | 53 | - | 386974 396870 |
| 228 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.5 | A13SW (S) | 49 | - | 386844 396835 |
| 229 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.5 | A13NE (NE) | 50 | - | 386990 397189 |
| 230 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.1 | A13SW (SW) | 51 | - | 386677 396817 |

# Motion Map Data (1:2,500)

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 231 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.4 | A13NE (NE) | 52 | - | 387021 397165 |
| 231 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.4 | A13NE (NE) | 57 | - | 387025 397168 |
| 232 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.3 | A13NW (N) | 55 | - | 386872 397179 |
| 233 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.9 | A13NE (NE) | 55 | - | 386989 397193 |
| 234 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.9 | A13NE (NE) | 56 | - | 387055 397153 |
| 234 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.6 | A13NE (NE) | 61 | - | 387051 397158 |
| 235 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.3 | A13NE (E) | 56 | - | 387131 397091 |
| 236 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.9 | A13NW (W) | 63 | - | 386629 397065 |
| 237 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.5 | A13SW (SW) | 67 | - | 386646 396845 |
| 238 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.1 | A13NE (NE) | 67 | - | 387077 397164 |
| 239 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.1 | A13SW (SW) | 68 | - | 386648 396832 |
| 240 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.5 | A13NW (W) | 69 | - | 386635 397076 |
| 240 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.8 | A13NW (W) | 71 | - | 386642 397082 |
| 240 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.3 | A13NW (W) | 75 | - | 386636 397083 |
| 241 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.9 | A13NW (W) | 73 | - | 386615 397064 |
| 242 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.8 | A13NE (NE) | 75 | - | 387007 397209 |
| 243 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.0 | A13NE (NE) | 75 | - | 387006 397209 |
| 244 | **Motion Map**<br>Average Velocity Gradient (mmyear): 2.1 | A13NE (N) | 75 | - | 386953 397214 |
| 244 | **Motion Map**<br>Average Velocity Gradient (mmyear): 2.2 | A13NE (N) | 79 | - | 386952 397218 |
| 245 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.5 | A13NE (NE) | 79 | - | 387007 397213 |

# Motion Map Data (1:2,500)

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 245 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.5 | A13NE<br>(NE) | 84 | - | 387010<br>397216 |
| 245 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.5 | A13NE<br>(NE) | 88 | - | 387013<br>397220 |
| 246 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.6 | A13NE<br>(NE) | 80 | - | 387009<br>397213 |
| 246 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.6 | A13NE<br>(NE) | 83 | - | 387007<br>397217 |
| 246 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.6 | A13NE<br>(NE) | 87 | - | 387009<br>397221 |
| 247 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.3 | A13NE<br>(NE) | 81 | - | 387147<br>397128 |
| 248 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.5 | A13NW<br>(N) | 83 | - | 386857<br>397203 |
| 248 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.2 | A13NW<br>(N) | 84 | - | 386861<br>397206 |
| 249 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.3 | A13NW<br>(W) | 83 | - | 386588<br>397017 |
| 250 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.8 | A13SW<br>(W) | 84 | - | 386599<br>396953 |
| 250 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.8 | A13SW<br>(W) | 88 | - | 386596<br>396950 |
| 250 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.7 | A13SW<br>(W) | 88 | - | 386596<br>396946 |
| 250 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.1 | A13SW<br>(W) | 97 | - | 386587<br>396948 |
| 251 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.9 | A13SW<br>(W) | 87 | - | 386592<br>396971 |
| 252 | **Motion Map**<br>Average Velocity Gradient (mmyear): 1.4 | A13SW<br>(SW) | 88 | - | 386617<br>396868 |
| 253 | **Motion Map**<br>Average Velocity Gradient (mmyear): 2.0 | A13NW<br>(W) | 88 | - | 386605<br>397075 |
| 254 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.7 | A13NW<br>(W) | 92 | - | 386580<br>397031 |
| 255 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.3 | A13NW<br>(W) | 96 | - | 386579<br>397044 |
| 255 | **Motion Map**<br>Average Velocity Gradient (mmyear): 0.5 | A13NW<br>(W) | 99 | - | 386576<br>397044 |

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

| 1:2,500 | Mapsheet | Published Date |
|---|---|---|
| Lancashire And Furness | 104_11 | 1893 |
| Lancashire And Furness | 104_12 | 1893 |
| Lancashire And Furness | 104_15 | 1893 |
| Lancashire And Furness | 104_16 | 1893 |
| Lancashire And Furness | 104_11 | 1908 |
| Lancashire And Furness | 104_12 | 1908 |
| Lancashire And Furness | 104_15 | 1908 |
| Lancashire And Furness | 104_16 | 1908 |
| Lancashire And Furness | 104_11 | 1922 |
| Lancashire And Furness | 104_12 | 1922 |
| Lancashire And Furness | 104_15 | 1922 |
| Lancashire And Furness | 104_16 | 1922 |

**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 |
| Cheshire | 003A_00 | 1882 |
| Cheshire | 010_00 | 1882 |
| Lancashire And Furness | 104_NE | 1894 |
| Lancashire And Furness | 104_SE | 1895 |
| Cheshire | 003A_SE | 1899 |
| Cheshire | 010_NE | 1899 |
| Lancashire And Furness | 104_NE | 1909 |
| Lancashire And Furness | 104_SE | 1909 |
| Cheshire | 003A_SE | 1911 |
| Cheshire | 010_NE | 1911 |
| Lancashire And Furness | 104_NE | 1923 |
| Lancashire And Furness | 104_SE | 1923 |
| Cheshire | 003A_SE | 1938 |
| Cheshire | 010_NE | 1938 |
| Ordnance Survey Plan | SJ89NE | 1956 |
| **1:10,000** | **Mapsheet** | **Published Date** |
| Ordnance Survey Plan | SJ89NE | 1993 |

| Mining and Cavities Data | Version | Update Cycle |
|---|---|---|
| **BGS Recorded Mineral Sites**<br>British Geological Survey - National Geoscience Information Service | May 2015 | Bi-Annually |
| **Coal Mining Affected Areas**<br>The Coal Authority - Mining Report Service | March 2014 | As notified |
| **Man Made Mining Cavities**<br>Peter Brett Associates | November 2014 | Bi-Annually |
| **Mining Instability**<br>Ove Arup & Partners | October 2000 | Not Applicable |
| **Natural Cavities**<br>Peter Brett Associates | November 2014 | 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 | August 2015 | Quarterly |
| **Subsidence Investigations**<br>CET Structures Ltd | August 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 |

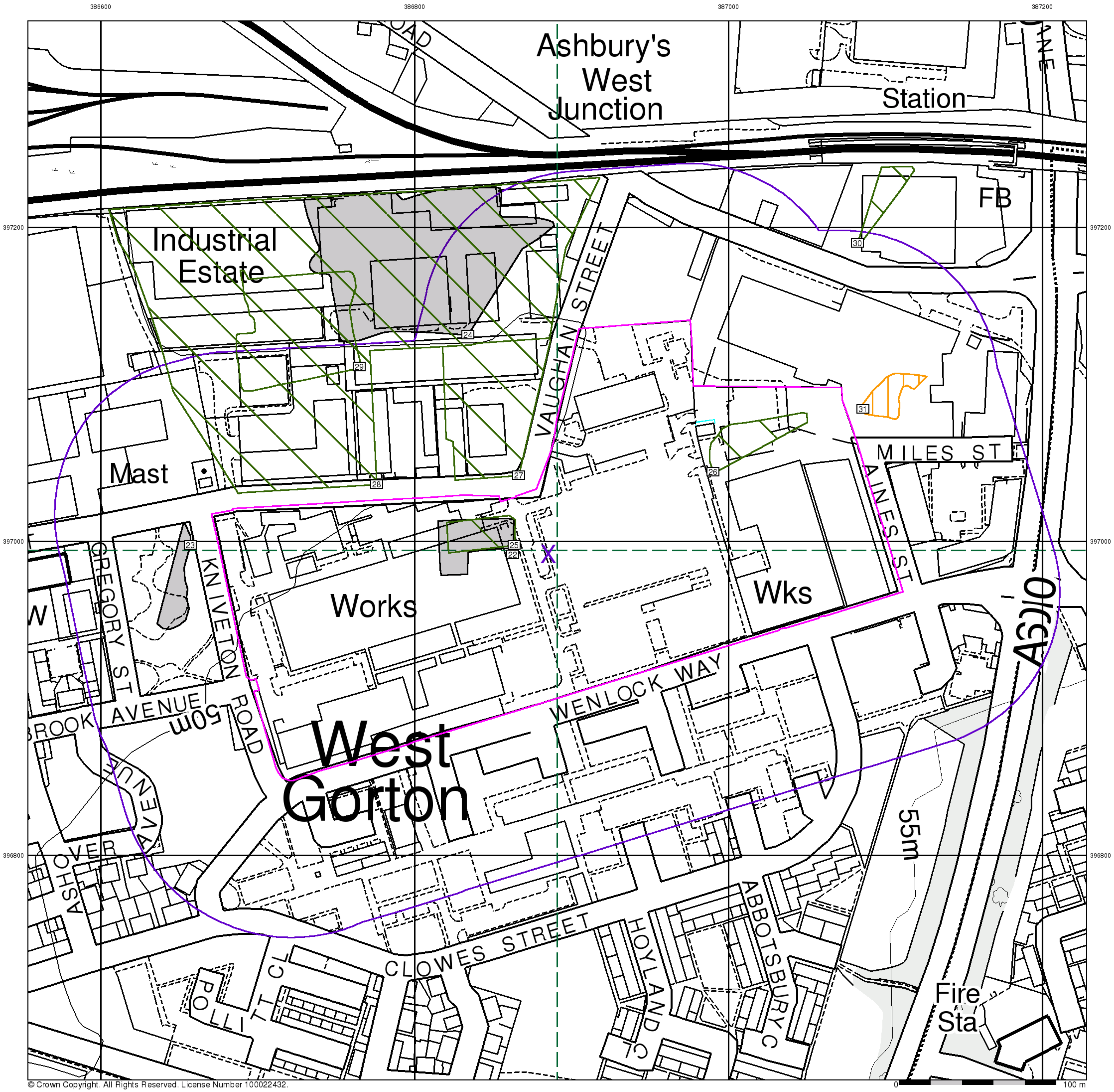
# Data Suppliers

A selection of organisations who provide data within this report

| Data Supplier | Data Supplier Logo |
|---|---|
| **Ordnance Survey** | Ordnance Survey®<br>Licensed Partner |
| **British Geological Survey** | British Geological Survey<br>NATURAL ENVIRONMENT RESEARCH COUNCIL |
| **The Coal Authority** | THE COAL AUTHORITY |
| **Ove Arup** | ARUP |
| **Peter Brett Associates** | pba<br>peterbrett |
| **Wardell Armstrong** | wardell armstrong<br>your earth our world |
| **Johnson Poole & Bloomer** | JPB |

# Useful Contacts

| Contact | Name and Address | Contact Details |
|---|---|---|
| 1 | **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 |
| 2 | **The Coal Authority - Mining Report Service**<br>200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG | Telephone: 0845 7626848<br>Email: thecoalauthority@coal.gov.uk |
| 3 | **Peter Brett Associates**<br>Caversham Bridge House, Waterman Place, Reading, Berkshire, RG1 8DN | Telephone: 0118 950 0761<br>Fax: 0118 959 7498<br>Email: reading@pba.co.uk<br>Website: www.pba.co.uk |
| 4 | **Ove Arup & Partners**<br>Central Square, Forth Street, Newcastle upon Tyne, Tyne and Wear, NE1 3PL | Telephone: 0191 261 6080<br>Fax: 0191 261 7879 |
| 5 | **Landmark Information Group Limited**<br>Imperium, Imperial Way, Reading, Berkshire, RG2 0TD | Telephone: 0844 844 9960<br>Fax: 0844 844 9951<br>Email: customerservice@promap.co.uk<br>Website: www.landmarkinfo.co.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 |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**Envirocheck® Mining**

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

## General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point
- 8 Map ID
- ☐ Several of Type at Location

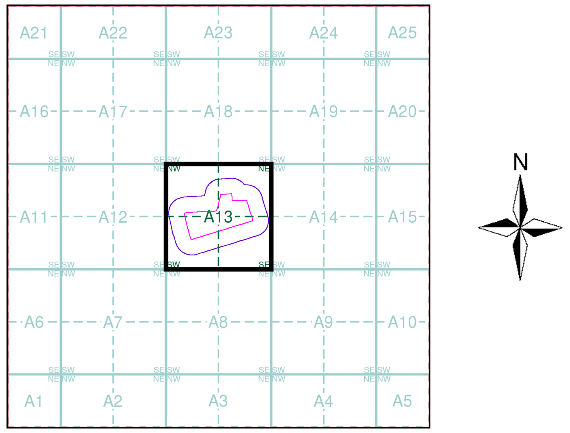
## Potentially Contaminative Industrial Uses (Extractive Industries Activity)

| | 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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## Order Details

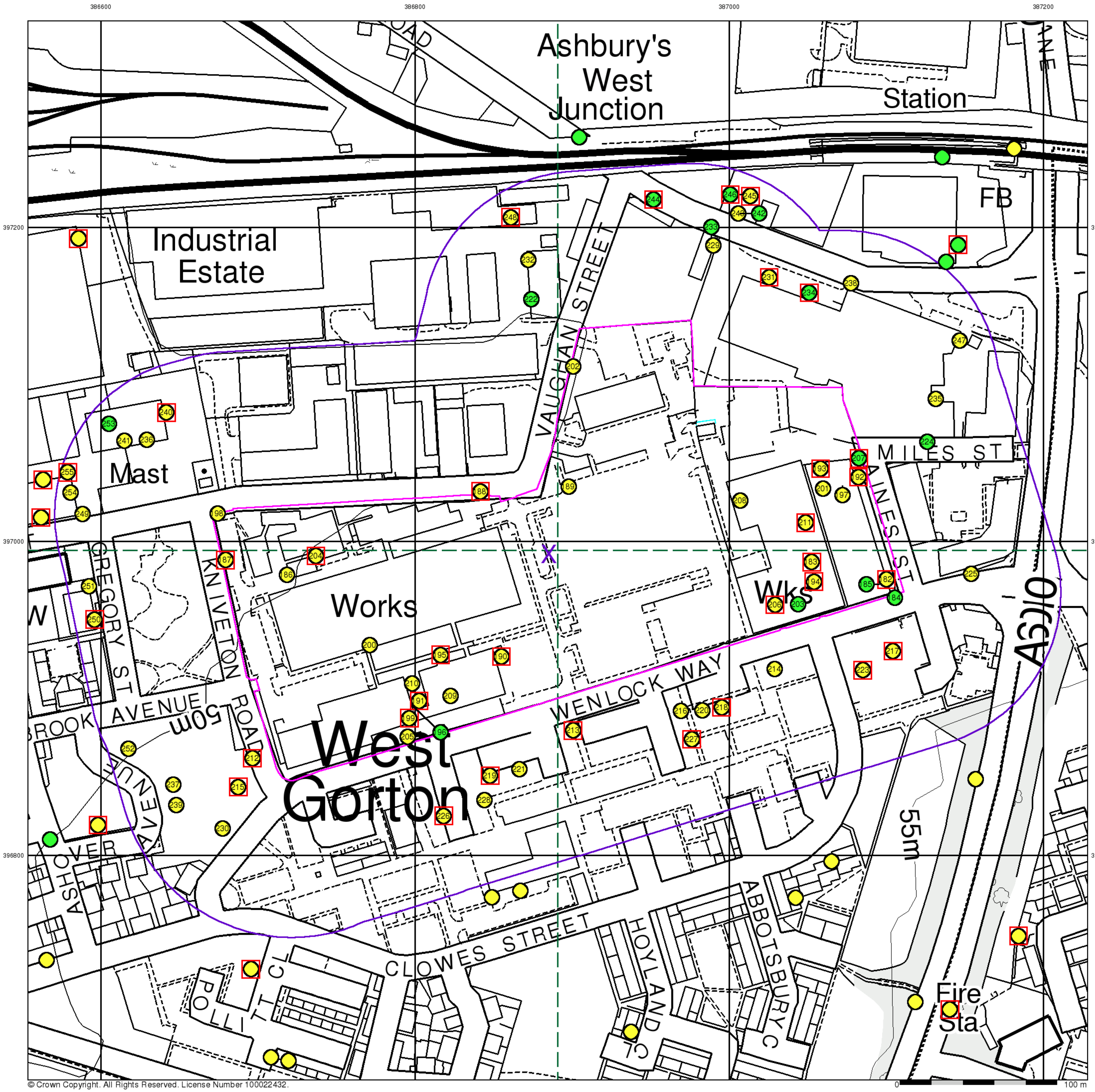
| | |
|---|---|
| Order Number: | 73720566_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Plot Buffer (m): | 100 |

## Site Details

Site at 386930, 397100

**Landmark** Information Group

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



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Ashbury's West Junction
Station
FB
Industrial Estate
Mast
VAUGHAN STREET
MILES ST
GAINES ST
Works
Wks
GREGORY ST
KNIVETON ROAD
BROOK AVENUE
WENLOCK WAY
West Gorton
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**Envirocheck® Mining**

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

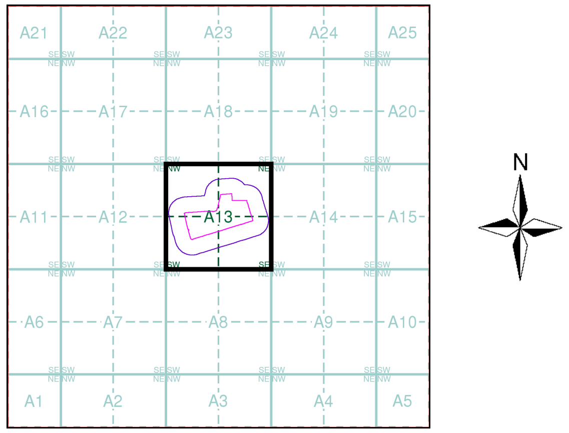
### General

Specified Site
Specified Buffer(s)
X Bearing Reference Point
8 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



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A1
A2
A3
A4
A5
N

## Order Details

| | |
|---|---|
| Order Number: | 73720566_1_1 |
| Customer Ref: | 2913 |
| National Grid Reference: | 386890, 396990 |
| Slice: | A |
| Site Area (Ha): | 6.84 |
| Plot Buffer (m): | 100 |

## Site Details

Site at 386930, 397100

**Landmark** Information Group

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

# APPENDIX 7

# COAL AUTHORITY MINING REPORT AND COAL AUTHORITY ABANDOMENT PLAN (LIMESTONE)

The Coal
Authority

Issued by:
The Coal Authority, Property Search Services, 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire, NG18 4RG
Website: www.groundstability.com Phone: 0345 762 6848 DX 716176 MANSFIELD 5

---

**LANDMARK INFORMATION GROUP LIMITED**
**SOWTON INDUSTRIAL ESTATE**
**ABBEY COURT**
**UNIT 5/7 EAGLE WAY**
**EXETER**
**DEVON**
**EX2 7HY**

| | |
|---|---|
| Our reference: | **51001007086001** |
| Your reference: | **72946036_3\|** |
| Date of your enquiry: | **24 September 2015** |
| Date we received your enquiry: | **24 September 2015** |
| Date of issue: | **24 September 2015** |

This report is for the property described in the address below and the attached plan.

# Non-Residential Coal Authority Mining Report

## SITE AT 386930, 397100, GREATER MANCHESTER,

This report is based on and limited to the records held by, the Coal Authority, and the Cheshire Brine Subsidence Compensation Board's records, at the time we answer the search.

| | |
|---|---|
| Coal mining | See comments below |
| Brine Compensation District | No |

### *Information from the Coal Authority*

### Underground coal mining

#### Past

The property is in the likely zone of influence from workings in 4 seams of coal at 280m to 1080m depth, and last worked in 1957.

Any ground movement from these coal workings should have stopped by now.

#### Present

The property is not in the likely zone of influence of any present underground coal workings.

#### Future

The property is not in an area for which the Coal Authority is determining whether to grant a licence to remove coal using underground methods.

The property is not in an area for which a licence has been granted to remove or otherwise work coal using underground methods.

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© The Coal Authority

The property is not in an area that is likely to be affected at the surface from any planned future workings.

However, reserves of coal exist in the local area which could be worked at some time in the future.

No notice of the risk of the land being affected by subsidence has been given under section 46 of the Coal Mining Subsidence Act 1991.

### *Mine entries*

There are no known coal mine entries within, or within 20 metres of, the boundary of the property.

### Coal mining geology

The Authority is not aware of any evidence of damage arising due to geological faults or other lines of weakness that have been affected by coal mining.

### Opencast coal mining

#### Past

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

#### Present

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

#### Future

The property is not within 800 metres of the boundary of an opencast site for which the Coal Authority is determining whether to grant a licence to remove coal by opencast methods.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

### Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres, since 31st October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

### Mine gas

There is no record of a mine gas emission requiring action by the Coal Authority within the boundary of the property.

### Hazards related to coal mining

The property has not been subject to remedial works, by or on behalf of the Authority, under its Emergency Surface Hazard Call Out procedures.

### Withdrawal of support

The property is in an area for which notices of entitlement to withdraw support were published in 1955.

The property is not in an area for which a notice has been given under section 41 of the Coal Industry Act 1994, revoking the entitlement to withdraw support.

### Working facilities orders

The property is not in an area for which an Order has been made under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

### Payments to owners of former copyhold land

The property is not in an area for which a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

### *Information from the Cheshire Brine Subsidence Compensation Board*

The property lies outside the Cheshire Brine Compensation District.

### *Additional Remarks*

Information provided by the Coal Authority in this report is compiled in response to the Law Society's Con29M Coal Mining and Brine Subsidence Claim enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL. Please note that Brine Subsidence Claim enquiries are only relevant for England and Wales. This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority and Cheshire Brine Board's Terms and Conditions applicable at the time the report was produced.

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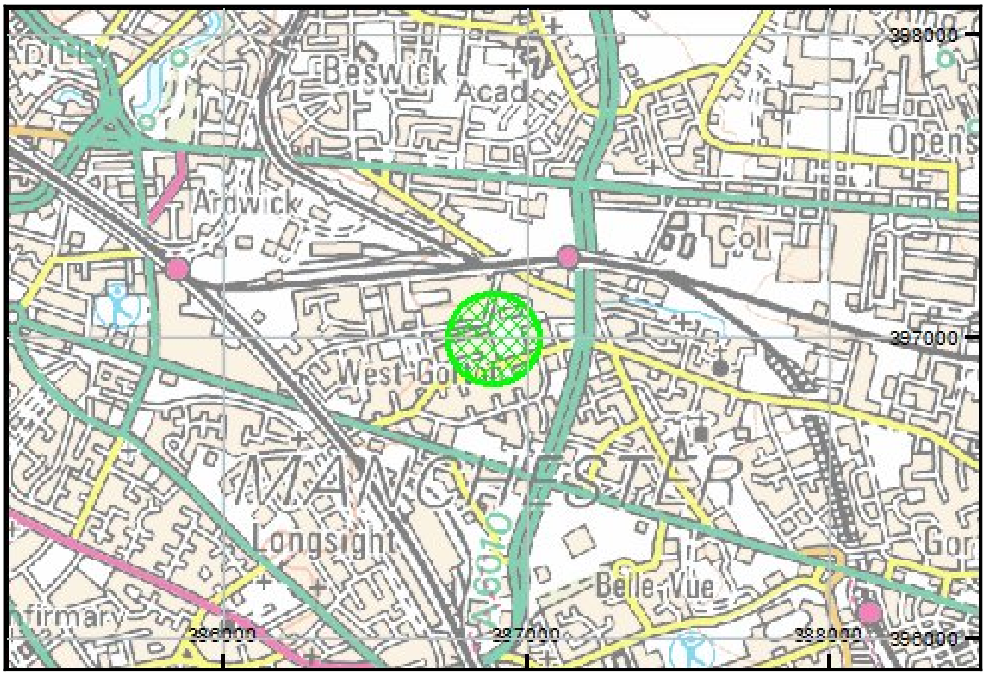
## *Location map*


Beswick
Acad
Opens
Ardwick
Coll
West Gorton
MANCHESTER
Longsight
A6010
Belle Vue
Gor
nfirmary
398000
397000
396000
386000
387000
388000

●

Approximate position
of property

## *Enquiry boundary*

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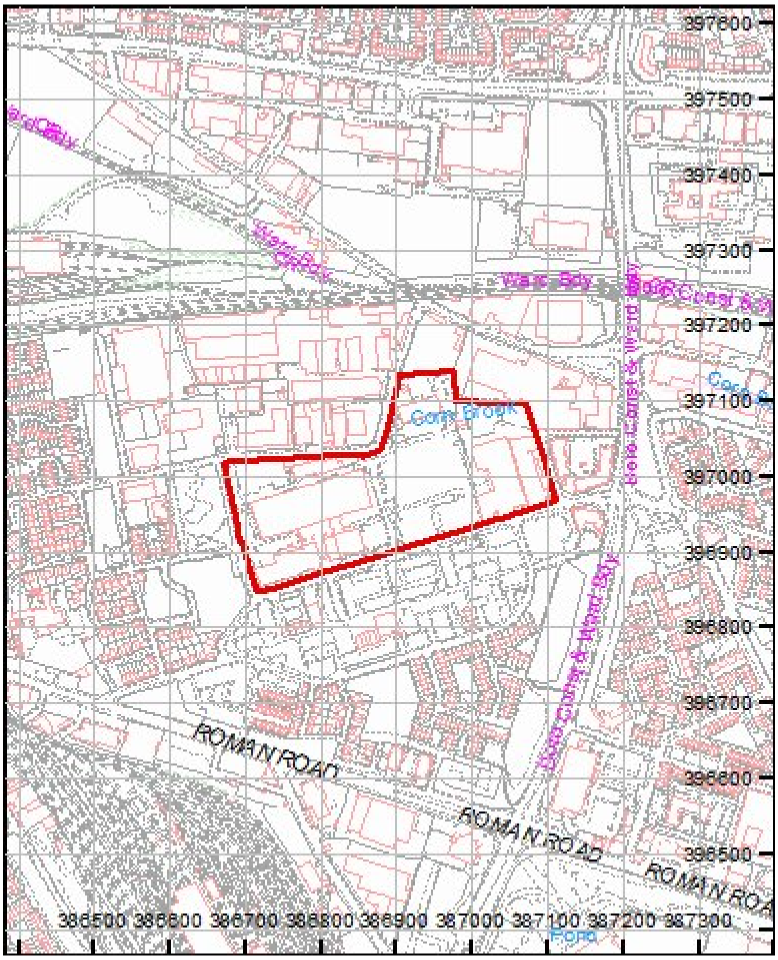
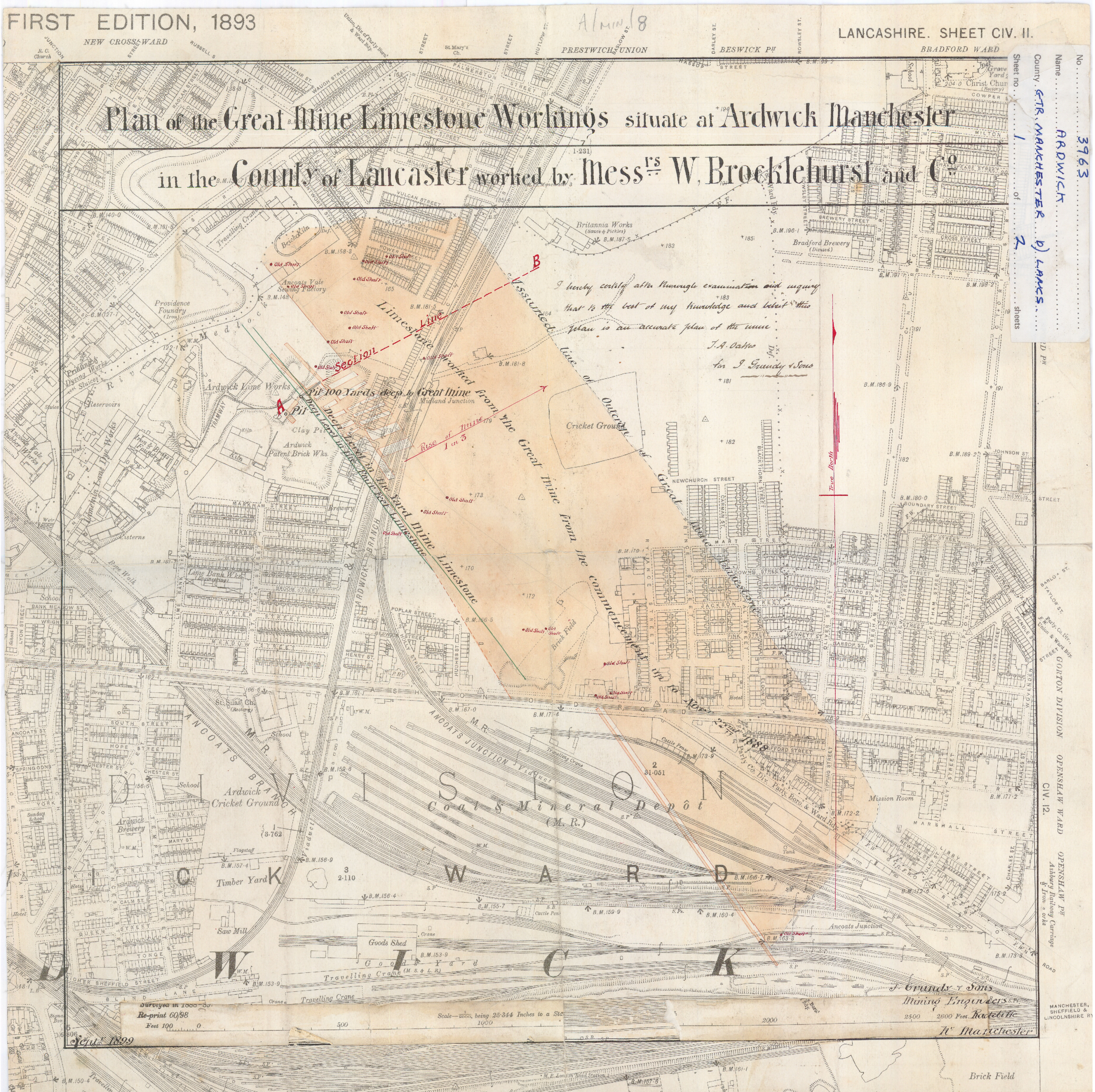

Ward Bdy
Ward Bdy
Ward Bdy
Boro Const & Ward Bdy
Gore Brook
ROMAN ROAD
ROMAN ROAD
ROMAN ROA
Pond
397600
397500
397400
397300
397200
397100
397000
396900
396800
396700
396600
396500
386500
386600
386700
386800
386900
387000
387100
387200
387300

## Key

Approximate position of enquiry boundary shown 🟥

Mapping sourced from Ordnance Survey®

# Plan of the Great Mine Limestone Workings situate at Ardwick Manchester in the County of Lancaster worked by Mess^rs W. Brocklehurst and C^o


FIRST EDITION, 1893
A/min/8
LANCASHIRE. SHEET CIV. II.
NEW CROSS WARD
PRESTWICH UNION
BESWICK P^H
BRADFORD WARD
No. 3963
Name ARDWICK
County GTR. MANCHESTER (LANCS)
Sheet no 1 of 2 sheets
B
A
Section Line
Limestone worked from the Great Mine from the commencement up to Nov^r 22^nd 1888
Assumed line of Outcrop of Great Mine Limestone
Pit 100 Yards deep to Great Mine
Pit
Deep Level in the Yard Mine Limestone
Deep Level in the Four Feet Limestone
Rise of Mine 1 in 3
Old Shaft
True North
Britannia Works (Sauce & Pickles)
Bradford Brewery (Disused)
Cricket Ground
Ancoats Vale Sewing Factory
Providence Foundry
Ardwick Lime Works
Ardwick Patent Brick Wks.
Clay Pit
Midland Junction
Brick Field
Ardwick Cricket Ground
Ardwick Brewery
Timber Yard
Saw Mill
Goods Shed
Goods Yard (M. S. & L. R.)
Travelling Crane
Coal & Mineral Depôt (M.R.)
ANCOATS JUNCTION Viaduct
Ancoats Junction
Mission Room
ASHTON OLD ROAD
NEWCHURCH STREET
ARDWICK BRANCH
DIVISION
ARDWICK WARD
GORTON DIVISION
OPENSHAW WARD
OPENSHAW P^H
MANCHESTER, SHEFFIELD & LINCOLNSHIRE RY.
Surveyed in 1888-89.
Re-print 60/98
Scale—1/2500, being 25·344 Inches to a Sta
Feet 100 0 500 1000 2000 2500 2600 Feet
Sept^r 1899

I hereby certify after thorough examination and inquiry that to the best of my knowledge and belief this plan is an accurate plan of the mine

J. A. Oakes
for J. Grundy & Sons

J. Grundy & Sons
Mining Engineers
Radcliffe
N^r Manchester

The Coal Authority

Catalogue No.: OM3963 Sheet Info: 1 OF 2

Date: 14/10/2015

Scale: 1 TO 2500

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Michael Carter - Integra Consulting Environmental Ltd,14-32 Hewitt Street,*,Manchester,M15 4GB,UK

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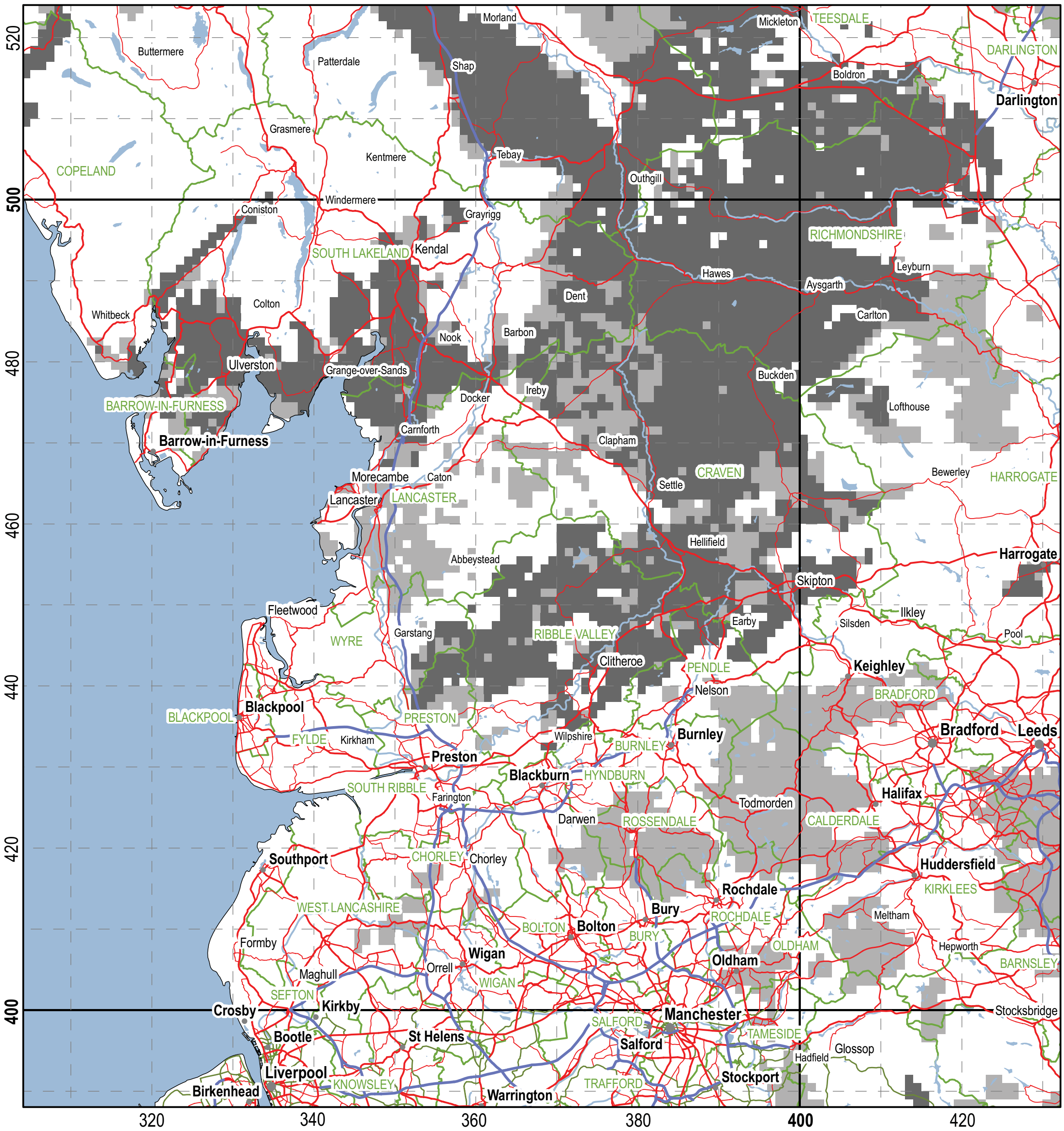
# APPENDIX 8

# EXTRACTS OF RADON ATLAS FOR ENGLAND AND WALES


520
500
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Buttermere
Patterdale
Morland
Shap
Mickleton
TEESDALE
DARLINGTON
Boldron
Darlington
Grasmere
Kentmere
Tebay
COPELAND
Outhgill
Coniston
Windermere
Grayrigg
RICHMONDSHIRE
SOUTH LAKELAND
Kendal
Hawes
Aysgarth
Leyburn
Dent
Colton
Whitbeck
Carlton
Barbon
Nook
Ulverston
Grange-over-Sands
Buckden
Ireby
Docker
Lofthouse
BARROW-IN-FURNESS
Carnforth
Barrow-in-Furness
Clapham
Morecambe
Caton
CRAVEN
Bewerley
HARROGATE
Settle
Lancaster
LANCASTER
Hellifield
Abbeystead
Harrogate
Skipton
Fleetwood
Ilkley
Silsden
Earby
Garstang
WYRE
RIBBLE VALLEY
Pool
Clitheroe
PENDLE
Keighley
Nelson
BRADFORD
Blackpool
BLACKPOOL
PRESTON
Bradford
Leeds
Wilpshire
Burnley
FYLDE
Kirkham
BURNLEY
Preston
Blackburn
HYNDBURN
SOUTH RIBBLE
Farington
Halifax
Todmorden
Darwen
ROSSENDALE
CALDERDALE
Southport
CHORLEY
Chorley
Huddersfield
Rochdale
KIRKLEES
WEST LANCASHIRE
Bury
BOLTON
Bolton
ROCHDALE
Meltham
BURY
Formby
Wigan
OLDHAM
Hepworth
Oldham
Orrell
BARNSLEY
Maghull
WIGAN
SEFTON
Crosby
Kirkby
Manchester
Stocksbridge
SALFORD
Bootle
St Helens
Salford
TAMESIDE
Glossop
Hadfield
Liverpool
KNOWSLEY
TRAFFORD
Stockport
Birkenhead
Warrington

The shading indicates the maximum requirements for radon protective measures in any location within each 1-km grid square to satisfy the guidance in Building Regulations Approved Document C. The requirement for an existing building with a valid postal address can be obtained for a small charge from www.ukradon.org. The requirement for a site without a postal address is available through the British Geological Survey GeoReports service, http://shop.bgs.ac.uk/GeoReports/.

**Level of protection required**

- ☐ None
- ▨ Basic
- ■ Full

**Settlements**

- ● **Blackburn**
- • **Keighley**
- Hawes
- Coniston

**Roads**

- Motorways
- Primary Roads
- A Roads
- B Roads

**National Grid**

- ☐ 100-km
- ⬚ 10-km

**Other Features**

- ☐ LOCAL ADMINISTRATIVE DISTRICT
- ● Water features

**Map 17 Lancashire, south Cumbria and western North Yorkshire, 100-km grid squares SD and SE (axis numbers are the coordinates of the National Grid)**

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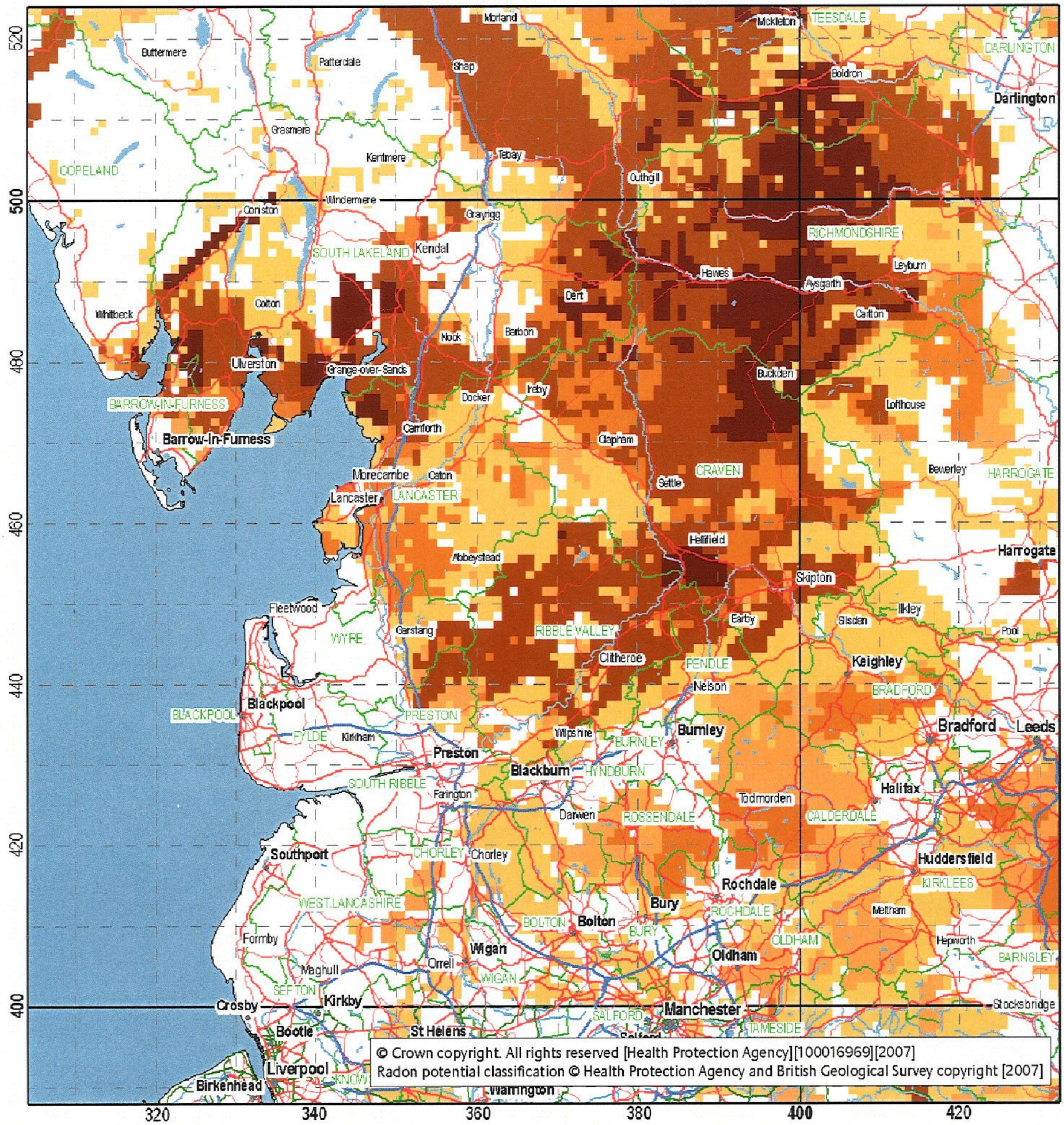
Radon potential classification © Health Protection Agency and British Geological Survey copyright [2007]


520
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Buttermere
Patterdale
Morland
Mickleton
TEESDALE
DARLINGTON
Shap
Boldron
Darlington
Grasmere
Kentmere
Tebay
COPELAND
Outhgill
Coniston
Windermere
Grayrigg
SOUTH LAKELAND
Kendal
RICHMONDSHIRE
Hawes
Leyburn
Aysgarth
Dent
Whitbeck
Colton
Nook
Barbon
Carlton
Ulverston
Grange-over-Sands
Buckden
BARROW-IN-FURNESS
Docker
Ireby
Lofthouse
Barrow-in-Furness
Carnforth
Clapham
Morecambe
Caton
CRAVEN
Beverley
HARROGATE
Lancaster
LANCASTER
Settle
Hellifield
Abbeystead
Harrogate
Skipton
Fleetwood
Ilkley
Earby
Silsden
WYRE
Garstang
RIBBLE VALLEY
Pool
Clitheroe
PENDLE
Keighley
Nelson
BRADFORD
Blackpool
BLACKPOOL
PRESTON
Bradford
Leeds
FYLDE
Kirkham
Wilpshire
Burnley
BURNLEY
Preston
Blackburn
HYNDBURN
Halifax
SOUTH RIBBLE
Farington
Todmorden
Darwen
ROSSENDALE
CALDERDALE
Southport
CHORLEY
Chorley
Huddersfield
Rochdale
KIRKLEES
WEST LANCASHIRE
Bury
ROCHDALE
Meltham
BOLTON
Bolton
BURY
Formby
OLDHAM
Hepworth
Wigan
Oldham
BARNSLEY
Orrell
Maghull
WIGAN
SEFTON
Kirkby
Crosby
Stocksbridge
SALFORD
Manchester
Bootle
St Helens
TAMESIDE
Salford
Liverpool
KNOWSLEY
Birkenhead
Warrington

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Radon potential classification © Health Protection Agency and British Geological Survey copyright [2007]

The colours show the maximum percentage band within each 1-km grid square of the national grid (see page 4). The best estimate for an individual property in a coloured square can be obtained for a small charge from www.ukradon.org. The white squares, the 0-1% band, contain no Affected Areas as defined by the HPA.

**Percentage of homes at or above the Action Level**

- ☐ **0 - 1**
- ▨ **1 - 3**
- ▨ **3 - 5**
- ▨ **5 - 10**
- ▨ **10 - 30**
- ▨ **Greater than 30**

**Settlements**

- ● **Blackburn**
- • **Keighley**
- Hawes
- Coniston

**Roads**

- Motorways
- Primary Roads
- A Roads
- B Roads

**National Grid**

- ☐ 100-km
- ☐ 10-km

**Other Features**

- ☐ LOCAL ADMINISTRATIVE DISTRICT
- ● Water features

**MAP 17 Lancashire, south Cumbria and western North Yorkshire, 100-km grid squares SD and SE (axis numbers are the coordinates of the national grid)**

# APPENDIX 9

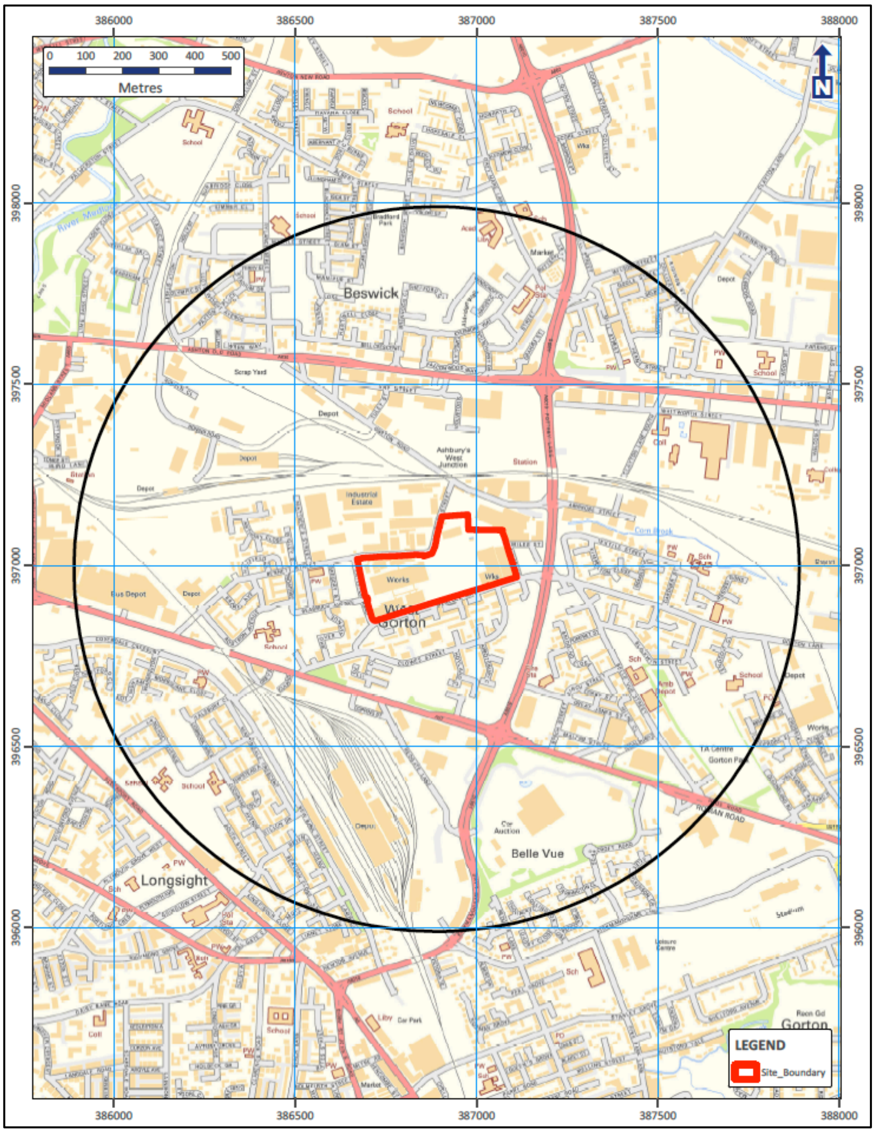
# PRELIMINARY AND DETAILED UNEXPLODED ORDNANCE (UXO) REPORTS

Landmark Information Group Ltd
Imperium, Imperial Way
Reading, Berkshire
RG2 0TD
United Kingdom

T: +44 (0)844 844 9952
W: www.envirocheck.co.uk

# Preliminary Unexploded Ordnance (UXO) Risk Assessment

Meeting the requirements of CIRIA C681 “Unexploded Ordnance (UXO) – A guide for the Construction Industry” Risk Management Framework


386000
386500
387000
387500
388000
398000
397500
397000
396500
396000
0 100 200 300 400 500
Metres
N
Beswick
Gorton
Longsight
Belle Vue
LEGEND
Site_Boundary

**Site:** Site at 386930, 397100

**Originator:** Rebecca Griffiths

**Released By:** Lisa Askham (28th September 2015)

6 Alpha Project Number: P4848
Landmark Order Number: 72946036_2
Client Reference: 2913

www.envirocheck.co.uk - +44 (0) 844 844 9952
customerservice@envirocheck.co.uk

## Study Site

The Study Site is described as "Site at 386930, 397100", and it is centred on National Grid Reference 386890, 396990.

## Threat Potential

UXO PROBABILITY ASSESSMENT = 4 RATING, INDICATING A MEDIUM/HIGH PROBABILITY OF UXO ENCOUNTER

The rating scale can be seen on *Figure 2* (Probability of UXO Encounter). In accordance with current guidelines (CIRIA C681 Chapter 5), the highest risk rating has been determined at this specific site for UXO risk consideration and has been used for the final assessment and recommendations.

## Summary

During WWII the Study Site was situated within *Manchester County Borough*, which recorded 26 High Explosive (HE) bomb strikes per 1,000 acres; a relatively low level of bombing.

*Luftwaffe* aerial reconnaissance photography associated with the Site did not identify any primary bombing targets within close proximity. Nonetheless, various works and a factory (located on-Site) and numerous facilities located in the immediate vicinity may have been considered secondary bombing targets.

*Air Raid Precaution* (ARP) HE bomb strike records did not identify any HE bomb strikes within the Site. However, 9 HE bomb strikes were identified within 1,000m of the Site boundary and 5 IBs were located within 355m of the Site.

Official bomb damage mapping did not record damage to structures on-Site. However, post-war mapping identified numerous ruins located on-Site and within the immediate vicinity, which is strong evidence of bomb damage and nearby HE bomb strikes.

Given that a WWI munitions factory was situated within the Site, coupled with the fact that potential bomb damage was recorded on-Site and within the immediate vicinity during WWII; it would suggest that further action is warranted to address the potential for UXO encounter.

## Recommendations

In accordance with CIRIA C681 Chapter 5 on managing UXO risks, 6 Alpha recommends that the next stage in the risk management framework is:

### DETAILED UXO THREAT & RISK ASSESSMENT

We would be pleased to provide this service, please contact Envirocheck for further details:

Telephone: +44 (0)844 844 9952
Email: customerservice@envirocheck.co.uk

## Using This Report

This Preliminary Assessment is designed to inform environmental and construction professionals of the potential threat of military related explosives and/or ordnance on, or in, the vicinity of the Study Site.

This assessment is designed to be employed as a site-screening tool to meet with the requirement of Phase One of the CIRIA UXO Risk Management Framework; there are two broad prospective outcomes; either the threat level requires a detailed UXO threat & risk assessment; or no further action is required. In the former instance we can provide a report within 10 working days (or more quickly upon application).

Two figures accompany the report, the *Second World War* (WWII) High Explosive (HE) Bomb Density and the final Probability of UXO Encounter. The purpose of this approach is to demonstrate that whilst bomb density statistics give an indication for WWII bombing, they should not be relied upon exclusively to generate a holistic assessment.

For further information, please contact Envirocheck:
Telephone: +44 (0)844 844 9952
Website: http://www.envirocheck.co.uk
Email: customerservice@envirocheck.co.uk

## Data Findings

| Threat Source (Within 1,000m) | Detail | |
|---|---|---|
| | Identified | Comments |
| Airfields/Military Facilities | ✗ | None recorded within 1,000m. |
| Ordnance Manufacture/Storage | ✓ | A WWI TNT explosives factory was located on-Site. |
| WWII Decoy Bombing Sites | ✗ | None recorded within 1,000m. |
| WWII Defensive Features | ✗ | None recorded within 1,000m. |
| WWII *Luftwaffe* Designated Bombing Targets | ✗ | *Luftwaffe* aerial photography did not identify any primary bombing targets within close proximity. |
| Secondary Bombing Targets | ✓ | A factory and several works (located on-Site) and various industrial facilities in the vicinity. |
| WWII Bomb Strikes Within Site Boundary | ✗ | ARP HE bomb strike records did not identify HE bomb strikes within the Site. |
| WWII Bomb Strikes Near Site Boundary | ✓ | ARP HE bomb strike records identified 9 HE bomb strikes within 1,000m, and IB strikes 160m west and 245m south. |
| WWII Bomb Damage | ✓ | Post-war mapping identified numerous ruins on-Site and within close proximity. |
| Abandoned Bomb Register | ✗ | The official abandoned bomb list did not identify any abandoned bombs within 1,000m. |
| WWII Bombing Density Per 1,000 Acres | ✓ | The Site was located within *Manchester County Borough*, which recorded 26 HE bomb strikes per 1,000 acres. |

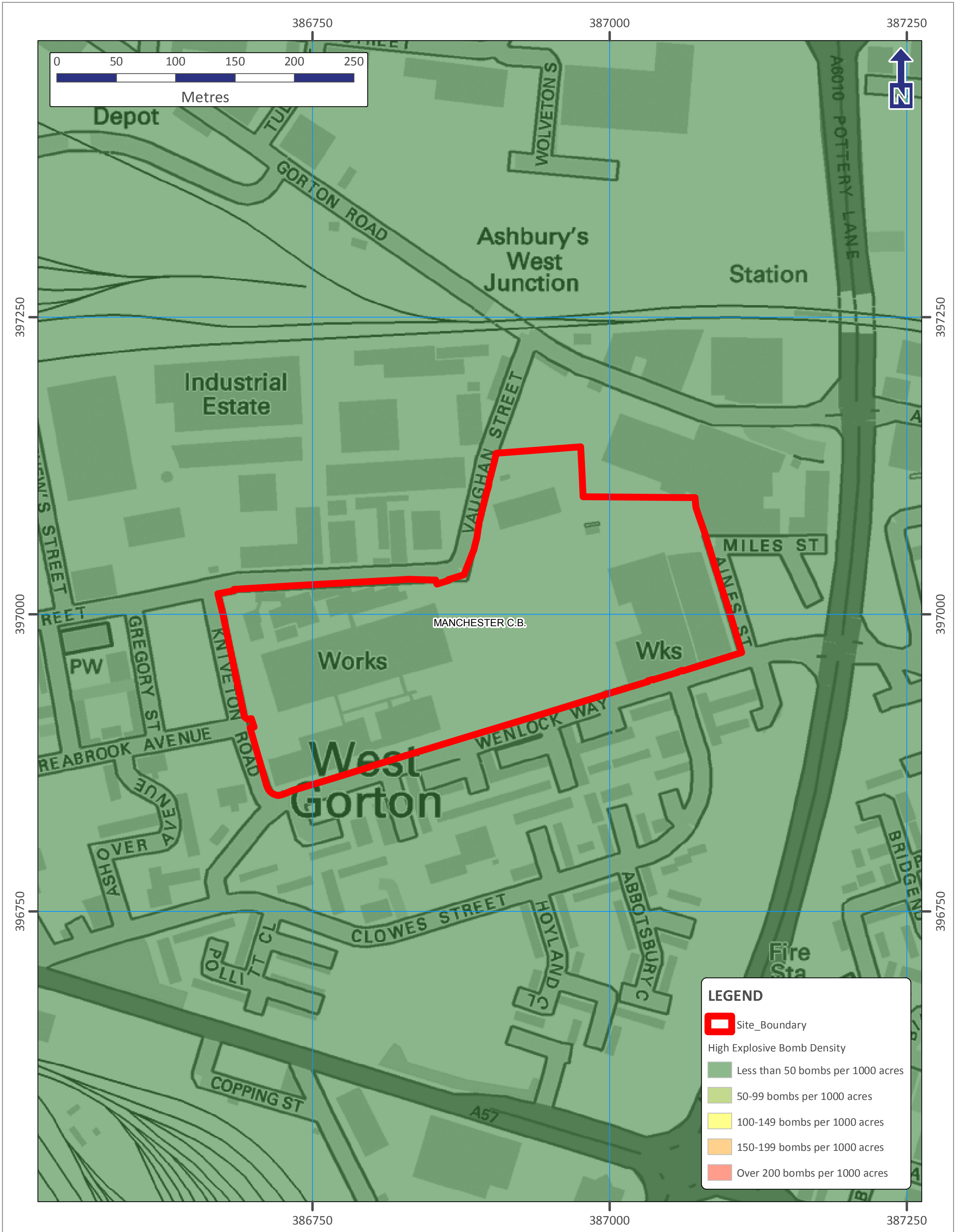
## Important Notes

1. The term 'Preliminary UXO Risk Assessment' has been used to describe this report, to fall inline with the CIRIA C681 guidelines. Whilst the term 'Risk' can be justifiably used at this stage, the reader should note that the 'Consequence' function of 'Risk' is not considered. Should it be required, this would be addressed in the 'Detailed UXO Threat & Risk Assessment' (Stages 2 and 3).
2. This report is accurate and up to date at the time of writing.
3. The assessment levels have been generated from historical data and third party sources. Where possible 6 Alpha have sought to verify the accuracy of such data, but cannot be held accountable for inherent errors that may be in third party data sets (e.g. National Archive or library sources).
4. 6 Alpha have exercised all reasonable care, skill and due diligence in producing this service.
5. Whilst every effort has been used to identify all potential UXO/explosive threats, there were a number of private facilities, which may not have released privately recorded information concerning UXO/explosive threats into the public domain. It is therefore possible that some of the aforementioned sites may not be included within the database.

BRITISH NATIONAL GRID

## SITE AT 386930, 397100

# WWII High Explosive Bomb Density

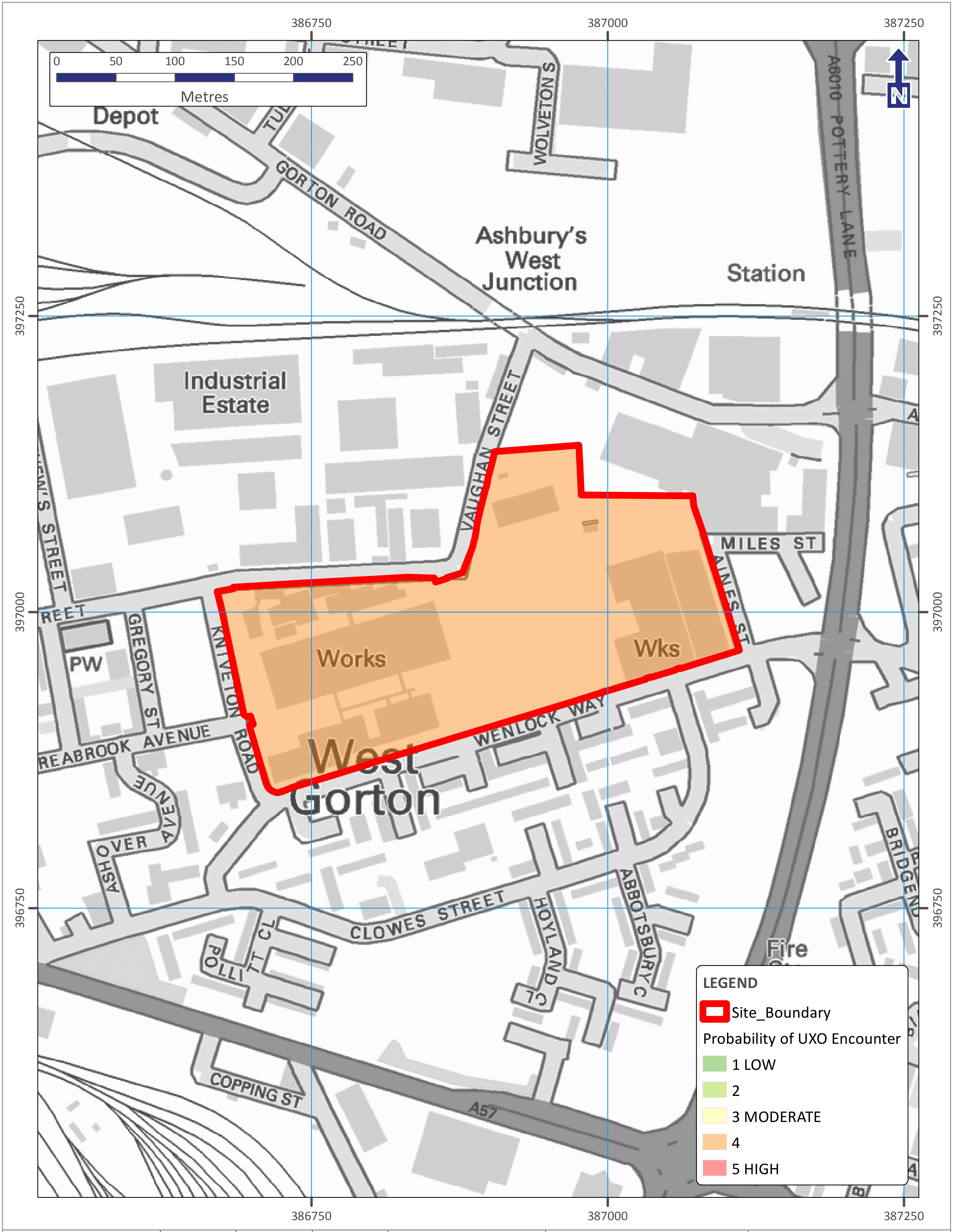

386750
387000
387250
397250
397000
396750
0
50
100
150
200
250
Metres
N
Depot
GORTON ROAD
WOLVETON S
Ashbury's West Junction
Station
A6010 POTTERY LANE
Industrial Estate
VAUGHAN STREET
MILES ST
MANCHESTER C.B.
Works
Wks
PW
GREGORY ST
KNIVETON ROAD
REABROOK AVENUE
WENLOCK WAY
West Gorton
ASHOVER AVENUE
CLOWES STREET
HOYLAND CL
ABBOTSBURY C
POLLITT CL
COPPING ST
A57
BRIDGEND
Fire Sta
LEGEND
Site_Boundary
High Explosive Bomb Density
Less than 50 bombs per 1000 acres
50-99 bombs per 1000 acres
100-149 bombs per 1000 acres
150-199 bombs per 1000 acres
Over 200 bombs per 1000 acres

| PROJECT NO. | FIGURE NO. | DRAWN BY | CHECKED BY | DATE | | |
|---|---|---|---|---|---|---|
| **P4848** | 1 | MS | RB | 25 September 2015 | Contains Ordnance Survey data © Crown copyright and database right 2015 | Produced by and Copyright to 6 Alpha Associates Ltd. Users noting any errors please notify 6 Alpha. |

BRITISH NATIONAL GRID

## SITE AT 386930, 397100

## Probability of UXO Encounter


386750
387000
387250
397250
397000
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50
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250
Metres
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Depot
GORTON ROAD
WOLVETON S
A6010 POTTERY LANE
Ashbury's West Junction
Station
Industrial Estate
VAUGHAN STREET
MILES ST
AINES ST
Works
Wks
KNIVETON ROAD
GREGORY ST
PW
REET
S STREET
REABROOK AVENUE
WENLOCK WAY
West Gorton
ASHOVER
AVENUE
CLOWES STREET
HOYLAND CL
ABBOTSBURY C
POLLI
TT CL
COPPING ST
A57
Fire
BRIDGEND

LEGEND

🟥 Site_Boundary

Probability of UXO Encounter

🟩 1 LOW

🟩 2

🟨 3 MODERATE

🟧 4

🟥 5 HIGH

| PROJECT NO. | FIGURE NO. | DRAWN BY | CHECKED BY | DATE | | |
|---|---|---|---|---|---|---|
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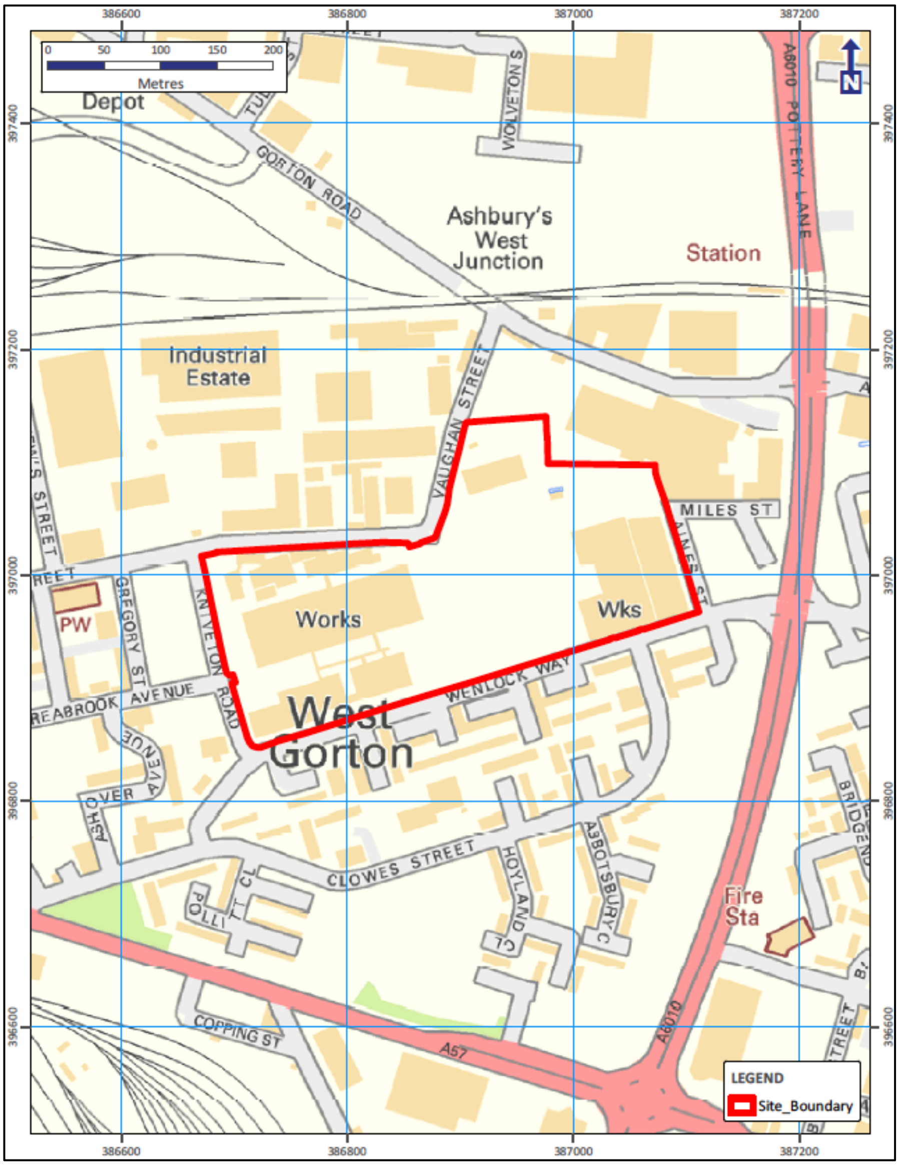
# Detailed Unexploded Ordnance (UXO) Threat & Risk Assessment

Meeting the requirements of CIRIA C681 “Unexploded Ordnance (UXO) – A guide for the Construction Industry” Risk Management Framework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**6 Alpha Project Number:** P4877
**Landmark Order Number:** 73493510_2
**Client Reference:** 2913
**Site**: Site at 386930, 397100

**Originator:** Rachel Bullock
**Technical Review:** Robin Rickard (15th October 2015)
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Delivered By

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# Acronyms and Abbreviations

| | |
|---|---|
| AA | Anti-Aircraft |
| AAA | Anti-Aircraft Ammunition |
| AAC | Army Air Corps |
| AFS | Advanced Flying School |
| ALARP | As Low As Reasonably Practicable |
| AOD | Above Ordnance Datum |
| ARP | Air Raid Precaution |
| ATS | Auxiliary Territorial Service |
| AXO | Abandoned Explosive Ordnance |
| BD | Bomb Disposal |
| BDO | Bomb Disposal Officer |
| bgl | Below Ground Level |
| BGS | British Geological Survey |
| BH | Borehole |
| BPD | Bomb Penetration Depth |
| CDP | Cast Driven Piles |
| CFA | Continuous Flight Auger |
| CIRIA | Construction Industry Research and Information Association |
| CPT | Cone Penetration Testing |
| CS | County Series |
| EFTS | Elementary Flying Training School |
| ELG | Emergency Landing Ground |
| EO | Explosive Ordnance |
| EOC | Explosive Ordnance Clearance |
| EOD | Explosive Ordnance Disposal |
| ERW | Explosive Remnants of War |
| FAA | Fleet Air Arm |
| FPP | Flight Pilot Pool |
| FTS | Flight Training School |
| GI | Ground Investigation |
| GIS | Geographic Information Systems |
| GL | Ground Level |
| GP | General Purpose |
| GPS | Global Positioning Systems |
| HAA | Heavy Anti-Aircraft |
| HE | High Explosive |
| HO | Home Office |
| HSE | Health and Safety Executive |
| IB | Incendiary Bomb |
| IED | Improvised Explosive Device |
| JSEODOC | Joint Service Explosive Ordnance Disposal Operations Centre |
| kg | Kilograms |
| km | Kilometres |
| LAA | Light Anti-Aircraft |
| lb | Pounds |
| LCC | London County Council |
| LDV | Local Defence Volunteers |
| LE | Low Explosive |
| LSA | Land Service Ammunition |
| m | Metres |
| MACP | Military Aid to the Civil Power |
| MoD | Ministry of Defence |
| mm | Millimetres |
| NATO | North Atlantic Treaty Organisation |
| NEQ | Net Explosive Quantity |
| NFF | National Filling Factory |
| NGR | National Grid Reference |
| OD | Ordnance Datum |
| OS | Ordnance Survey |
| OTU | Operational Training Unit |
| PBG | Polar Blasting Gelignite |
| PM | Parachute Mine |
| PoW | Prisoner of War |
| RADAR | Radio Detection And Ranging |
| RAF | Royal Air Force |
| RBL | Rifle Breach Loaded |
| RDX | Research Department Explosives |
| RFC | Royal Flying Corps |
| RML | Rifle Muzzle Loaded |
| RN | Royal Navy |
| RNAS | Royal Naval Air Service |
| ROF | Royal Ordnance Factory |
| SAA | Small Arms Ammunition |
| Sqn | Squadron |
| TA | Territorial Army |
| TNT | Trinitrotoluene |
| UK | United Kingdom |
| UN | United Nations |
| USAAF | United States Army Air Force |
| UXB | Unexploded Bomb |
| UXO | Unexploded Ordnance |
| V Weapons | *Vergeltungswaffe* – Vengeance Weapons |
| WAAF | Women's Auxiliary Air Force |
| WD | War Department |
| WWI | World War One |
| WWII | World War Two |

# EXECUTIVE SUMMARY

## Study Site

The Client has described the Study Site as "Site at 386930, 397100". The Site is located at NGR 543980, 181780.

## Risk Level

**MEDIUM/HIGH**

## Potential Threat Sources

The most probable UXO threat is posed by WWII *German* HE bombs, whilst IBs and *British* AAA projectiles (which were used to defend against *German* bombing raids) pose a residual threat. Furthermore, the fact that WWI explosives factory was situated within the Site would suggest that there is a contamination risk associated with this factory, which could include explosive materials, shells and/or charges as abandoned explosive ordnance (AXO).

## Risk Pathway

Given the types of UXO that might be present on Site, all types of aggressive intrusive engineering activities may generate a significant risk pathway.

## Key Findings

During WWII, the Study Site was located within the *Manchester County Borough,* which recorded 26 HE bombs per 1,000 acres, a relatively high level of bombing. However, given that the Site was situated within an industrial area during WWII, the localised bombing density may in fact have been much greater.

*Luftwaffe* aerial reconnaissance photography associated with the Site could not be located. Nonetheless, the immediate area comprised numerous industrial facilities all of which would have been considered secondary bombing targets, including iron works, chemical works and engineering works (located on-Site) and numerous facilities located within the immediate area.

ARP HE bomb strike mapping dated between 1940 and 1941 did not document any HE bomb strikes within the Site. Despite this, there is strong evidence that HE bomb strikes impacted nearby (possibly on-Site) after 1941. In addition, ARP mapping (1940 and 1941) reveals that multiple IB strikes were documented within the Site's vicinity, with the closest strike 160m to the west. Additional IBs may have fallen within the Study Site, however they fell in such large numbers that they were considered ubiquitous and accurate record keeping was either non-existent or perfunctory.

An analysis of the official bomb damage mapping did not record damage to structures on-Site. Despite this, multiple ruins included on post-war mapping located on-Site and within the immediate area is considered strong evidence that the Site was subjected to bomb damage. However, the bomb damage mapping did not record any bomb damage on-Site, this may be because the maps are dated 1940 to 1941 and the Site may have sustained bomb damage after this date.

A further analysis of pre and post-war mapping reveals that the Site comprised industrial facilities during WWII and therefore, it is possible that staff associated with the facilities inspected the Site for UXB entry holes following any raids. However, had there been undeveloped areas within the Site it is possible for a UXB entry hole to have gone unnoticed. Furthermore, had the Site sustained serious bomb damage it is plausible for debris to have obscured the UXB entry hole from view.

Moreover, historical records have revealed that an on-Site facility was used as an explosives factory during WWI. In this factory explosives were made to fill shells and charges were created to propel them. Therefore, there is the potential for a contamination risk from these items as well as explosive material. Furthermore, the fact that there is strong evidence of bombing and bomb damage on-Site and/or within the immediate vicinity would suggest that there is a further contamination risk of WWII material. As a result the Risk Level within the Site is assessed to be Medium/High.

# EXECUTIVE SUMMARY (…continued)

## Recommended Risk Mitigation

**All Groundworks in All Areas:**

**1. Operational UXO Risk Management Plan;** appropriate Site Management documentation should be held on Site to guide and plan for the actions which should be undertaken in the event of a suspected or real UXO discovery, (this plan can be supplied by 6 Alpha);

**2. UXO Safety & Awareness Briefings;** the briefings are essential when there is a possibility of explosive ordnance encounter and are a vital part of the general safety requirement. All personnel working on the Site should receive a briefing on the identification of a UXB, what actions they should take to keep people and equipment away from such a hazard and to alert Site management. Information concerning the nature of the UXB threat should be held in the Site office and displayed for general information on notice boards, both for reference and as a reminder for ground workers. The safety and awareness briefing is an essential part of the Health & Safety Plan for the Site and helps to evidence conformity with the principles laid down in the CDM regulations 2015, (this briefing can be supplied by 6 Alpha).

**All Trial Pits, Trenching and demolition of relic buildings:**

**3. EOD Banksman Support;** EOD Engineer to survey and/or supervise the trial pits, trenching and demolition of buildings (to 2m bgl) for UXO and to identify any suspicious items as the work proceeds in the EOD Banksman role, (this service can be provided by 6 Alpha).

**All Vibrating Columns undertaken below previously disturbed ground:**

**4. Intrusive Magnetometer Survey;** an intrusive survey (employing down-hole magnetometer or MagCone techniques) ahead of installation of the vibrating columns is strongly recommended. Such a survey should extend to the estimated bomb penetration depth or to the maximum depth of the works, whichever is encountered first, (this service can be provided by 6 Alpha).

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# ASSESSMENT METHODOLOGY

## Approach

6 Alpha Associates is an independent, specialist risk management consultancy practice, which has assessed the risk of encountering UXO (as well as buried bulk high explosives) at this Site, by employing a process advocated for this purpose by CIRIA. The CIRIA guide for managing UXO risks (C681) not only represents best practice but has also been endorsed by the HSE. Any risk mitigation solution is recommended *only* because it delivers the Client a risk reduced to ALARP at best value.

UXO hazards can be identified through the investigation of Local and National archives associated with the Site, MoD archives, local historical sources, historical mapping as well as contemporaneous aerial photography (if it is available). Hazards will have only been recorded if there is specific information that could reasonably place them within the boundaries of the Site. The amalgamation of information is then assessed to enable the researcher to provide relevant and accurate risk mitigation practices.

The assessment of UXO risk is a measure of *probability of encounter* and *consequence of encounter*; the former being a function of the identified hazard and proposed development methodology; the latter being a function of the type of hazard and the proximity of personnel (and/or other 'sensitive receptors', such as equipment) to the hazard, at the moment of encounter.

If UXO risks are identified, the methods of mitigation we have recommended are considered reasonably and sufficiently robust to reduce them to ALARP. We advocate the adoption of the legal ALARP principle because it is a key factor in efficiently and effectively ameliorating UXO risks. It also provides a ready means for assessing the Client's tolerability of UXO risk. In essence, the principle states that if the cost of reducing a risk significantly outweighs the benefit, then the risk may be considered tolerable. This does not mean that there is never a requirement for UXO risk mitigation, but that any mitigation must demonstrate that it is beneficial. Any additional mitigation that delivers diminishing benefits and that consume disproportionate time, money and effort are considered *de minimis* and thus unnecessary. Because of this principle, UXB and UXO risks will rarely be reduced to zero (nor need they be).

## Important Notes

Key source material is referenced within this document, whilst secondary/anecdotal information may be available upon request.

Although this report is up to date and accurate at the time of writing, our databases are continually being populated as and when additional information becomes available. Nonetheless, 6 Alpha have exercised all reasonable care, skill and due diligence in providing this service and producing this report.

The assessment levels are based upon our professional opinion and have been supported by our interpretation of historical records and third party data sources. Wherever possible, 6 Alpha has sought to corroborate and to verify the accuracy of all data we have employed, but we are not accountable for any inherent errors that may be contained in third party data sets (e.g. National Archive or other library sources), and over which 6 Alpha cannot exercise control.

# STAGE ONE – SITE LOCATION AND DESCRIPTION

## Study Site

The Client has described the Study Site as "Site at 386930, 397100". The Site is located at NGR 386890, 396990. The Site location and Site boundary are presented at *Figures 1* and *2* respectively.

## Location Description

The Study Site is situated within *West Gorton* and covers an area of 6.83 hectares (ha).

Furthermore, the Site is bounded by:

- North: *Bennett Street, Vaugham Street* and light industrial buildings;
- Northeast/East: *Aines Street*, light industrial buildings and a car park;
- South/Southeast: *Wenlock Way;*
- West/Southwest: *Kniveton Road*.

## Aerial Photography (Current) (*Figure 3*)

Current aerial photography shows that the Site is situated within a highly developed area of *Manchester* and comprises multiple commercial buildings within the Sit's eastern and western sector and comprises a large car park within the Site's centre.

## Proposed Works

The Client has described the following: *'Site investigation - trial pits to 2-4m below ground level. Demolition works - Removal of relic structures to approx. 2m bgl and re-profiling of excavated material. Proposed Development: Foundation solution likely to be vibrating stone columns to 4m bgl, excavation of service trenches to 2m bgl.'*

## Ground Conditions

The Client has described the ground conditions as follows: *'Site predominantly overlain by hardstanding consisting of macadam, concrete or ground floor slabs associated with buildings. Some areas of soft landscaping. Underlain by made ground of varying thicknesses up to approximately 5m. Likely to be subterranean structures / obstructions associated with historic site developments within this stratum. Underlain by natural strata of glacial till with thicknesses of up to 7m. Underlain by solid geology of mudstone, sandstone or limestone of the Halesowen Formation.'*

In addition to this information, 6 Alpha has referred to BGS borehole log *'SJ89NE127 – Brookes & Doxey Thomas Street'* (located just south of the Site's centre), recorded the following strata:

- 0m to 1.83m – Earth;
- 1.83m to 10.97m – Clay;
- 10.97m to 23.17m – Shale.

It is important to establish the specific ground conditions in order to determine the maximum *German* UXB penetration depth as well as the potential for other types of munitions to be buried. If the Site investigations and/or construction methodologies change, and/or if a specific methodology is to be employed, and/or if the scope of work is focused upon a specific part of the Site, then 6 Alpha are to be informed so that the prospective UXO risks and the associated risk mitigation methodology might be re-assessed. Certain ground conditions may also constrain certain types of UXO risk mitigative works e.g. magnetometer survey is adversely affected in mineralised and made ground.

# STAGE TWO – REVIEW OF HISTORICAL DATASETS

## Sources of Information Consulted

The following primary information sources have been used in order to establish the background UXO threat:

1. 6 Alpha's Azimuth Database;
2. Home Office WWII Bomb Census Maps;
3. WWII and post-WWII Aerial Photography;
4. Official Abandoned Bomb Register;
5. Official Bomb Damage maps;
6. Information gathered from the National Archives at Kew;
7. Historic UXO information provided by 33 Engineer Regiment (Explosive Ordnance Disposal) at Carver Barracks, Wimbish.

## Potential Sources of UXO Contamination

In general there are several activities that can contaminate a site with UXO but the three most common ways are: legacy munitions from military training/exercises; deliberate or accidental dumping (AXO) and ordnance resulting from war fighting activities (ERW).

During WWII, the *Luftwaffe* undertook bombing campaigns all over the UK. The most common UXO discovered today is the aerially delivered HE bomb, which are comparatively thick-skinned and dropped from enemy aircraft. If the bomb did not detonate, the force of impact allowed the UXO to penetrate the ground, leaving behind it a UXB entry hole. These entry holes were not always apparent and some went unreported, leaving the bomb buried and unrecorded. More rarely, additional forms of *German* UXO are occasionally discovered including *inter alia* 'V1' and 'V2' rockets, IBs and Anti-personnel (AP) bomblets.

Although the *Luftwaffe* had designated primary bombing targets across the UK, they jettisoned unused HE bombs over opportunistic targets and residential areas. As a result, thousands of buildings were damaged and civilian fatalities were common.

As the threat of invasion lingered over *Britain* during WWII, defensive actions were undertaken. The *British* and *Allied Forces* requisitioned large areas of land for military training and bomb storage (including HE bombs, naval shells, artillery and tank projectiles, explosives, LSA and SAA). Thousands of tonnes of these munitions were used for the *Allied Forces* weapon testing and military training alone. It has been estimated that at least 20 per cent of the UK's land has been used for military training at some point.

CIRIA C681 suggests that approximately 10 per cent of all munitions deployed failed to function as designed. ERW are therefore, still occasionally found whist undertaking construction and civil engineering groundwork.

Furthermore, in exceptional circumstances, UXO is discovered unexpectedly and without apparent rational explanation. There are several ways this may occur:

- When *Luftwaffe* aircraft wanted to swiftly escape e.g. from an attack they would jettison all of their bombs and flee. This is commonly referred to as *'tip and run'* and has resulted in bombs being found in unexpected locations;
- Transportation of sediment containing munitions to an area that was previously free of UXO, usually related to construction activities such as aggregate that may have contaminated whilst dredged offshore;
- Poor precision during targeting (due to high altitude bombing/poor visibility) resulted in bombs landing within the surrounding area.

# STAGE TWO – REVIEW OF HISTORICAL DATASETS (…continued)

## Site History

From an analysis of the CS and OS historical mapping associated with the Site, the following Site history can be deduced:

**1893 CS Map** – The Study Site was situated within a highly developed area of *Manchester* and predominately comprised two chemical works, engineering works, iron works and a reservoir. Nonetheless, rows of houses were also shown within the Site's southwestern corner and the Site's northwestern sector appeared to be undeveloped;

**1908 CS Map –** The row of houses had been extended into the Site's northwestern sector;

**1922 CS Map –** A large structure had been constructed within the Site's northwestern sector;

**1948 to 1950 OS Map –** The iron works along the southern boundary appear to have been redeveloped and in the Site's centre a large industrial building had been constructed. Furthermore, a canteen had been constructed within the Site's northwestern sector and several buildings were labeled as Ruins within the Site's northeastern sector;

**1964 to 1967 OS Map –** Large areas of housing had been removed from the Site's southwestern sector;

**1975 to 1990 OS Map –** All of the houses had been removed from the Site's southwestern sector and were replaced with a large industrial building;

**1992 OS Map –** The Study Site had been subjected to major re-development and it appeared that buildings had been removed and replaced with large buildings along the Site's northern boundary. Additional works and structures had been constructed along the Site's northern boundary. Nonetheless, the Site's centre remained undeveloped, although may have been subjected to hardstanding;

**2006 OS Map –** Changes were not recorded within the Study Site;

**2015 OS Map –** Changes were not recorded within the Study Site.

## WWII Site Use

The CS mapping prior to WWII (1922), shows that the Study Site was situated within an industrial area of *Manchester* and comprised several works. Despite this, rows of houses were shown within the Site's southwestern sector.

## WWII Bombing of Manchester

*Manchester's* importance to the *British* war economy as an inland port, industrial centre and aircraft manufacturer meant the city and surrounding area represented a significant bombing target for the *Luftwaffe*. The first air raids occurred during August 1940 and continued until 1942. The majority of these small-scale raids were across the cities suburbs causing damage to properties and minimal casualties. Of the notable buildings in the city, the *Palace Theatre* on *Oxford Street* was bombed during September 1940.

The *Luftwaffe* bombing campaign of *Manchester* peaked between the 22nd and the 24th December 1940 (*Manchester Blitz*), and involved over 400 enemy aircraft delivering in excess of 460 tons of HE bombs and 37,000 IBs. Following this raid, approximately 65 warehouses, 200 business premises and 150 offices were destroyed or damaged with the *Manchester Cathedral*, the *Royal Exchange* and the *Free Trade Hall* among the significant buildings damaged. An estimated 684 people were killed and a further 2,364 people were injured.

*Manchester* continued to be bombed throughout the war and on the 24th December 1944 flying bombs were launched towards the city. The rockets failed to meet their intended targets with one stray bomb impacting *Oldham*, killing 27 civilians. The city was beyond the range of the 'V'2 rocket.

# STAGE TWO – REVIEW OF HISTORICAL DATASETS (…continued)

## WWII Luftwaffe Bombing Targets (*Figure 4*)

Prior to WWII, the *Luftwaffe* conducted numerous aerial photographic reconnaissance missions over *Britain*, recording key military, industrial and commercial facilities for attack, in the event of war. In addition, logistics infrastructure and public services, such as railways, canals, power stations, reservoirs, water and gas works were also considered viable bombing targets.

*Luftwaffe* aerial reconnaissance photography associated with the Site could not be located. Nonetheless, the immediate area comprised numerous industrial facilities all of which would have been considered secondary bombing targets, including iron works, chemical works and engineering works (located on-Site) and numerous facilities located within the immediate area.

## WWII HE Bomb Strikes (*Figure 5*)

During WWII, ARP wardens compiled detailed logs of bomb strikes across their respective districts. ARP mapping dated between 1940 and 1941 did not document any HE bomb strikes within the Site. Despite this, there is strong evidence that HE bomb strikes impacted nearby (possibly on-Site) after 1941.

Nonetheless, ARP mapping dated between 1940 and 1941 reveals that multiple IB strikes were documented within the Site's vicinity, with the closest strike 160m to the west. Furthermore, additional IBs may have fallen within the Study Site, however they fell in such large numbers that they were considered ubiquitous and accurate record keeping was either non-existent or perfunctory.

## WWII Bomb Damage (*Figure 6*)

An analysis of the official bomb damage mapping did not record damage to structures on-Site. Despite this, multiple ruins indicated in post-war mapping located on-Site and within the immediate area is posited as strong evidence that the Site was subjected to bomb damage and therefore, nearby HE bomb strikes.

The bomb damage mapping did not record bomb damage on-Site, this may be because the maps are dated 1940 to 1941 and the Site may have sustained bomb damage after this date.

## WWII HE Bomb Density (*Figure 7*)

The Study Site was located within the *Manchester County Borough,* which recorded 26 HE bombs per 1,000 acres, a relatively high level of bombing. However, given that the Site was situated within an industrial area during WWII, the localised bombing density may in fact have been much greater.

## Abandoned Bombs

An examination of the official abandoned bomb records has not identified any abandoned bombs within 1,000m of the Study Site.

## Records of WWII UXB Disposal Tasks

An examination of historical records documenting UXBs dealt with in the local area could not be found. Furthermore, there has been no evidence found to suggest that a UXB was discovered on or near the Study Site during WWII.

## Records of Post-WWII UXB Disposal Tasks

Historical records of the post-WWII BDO tasks associated with the area could not be located. Furthermore, there has been no evidence found to suggest that a UXB was discovered on or near the Study Site.

# STAGE THREE – DATA ANALYSIS

## Was the ground undeveloped during WWII?

No; according to the CS mapping prior to WWII (1922), the Study Site was situated within an industrialised area of *Manchester* and was highly developed with industrial facilities. Nonetheless, there may have been undeveloped areas within the Site between buildings.

## Is there a reason to suspect that the immediate area was a bombing target during WWII?

No; *Luftwaffe* aerial reconnaissance photography associated with the Site could not be located. Nonetheless, the immediate area comprised numerous industrial facilities all of which would have been considered secondary bombing targets, including iron works, chemical works and engineering works (located on-Site) and numerous facilities located within the immediate area.

## Is there firm evidence that ordnance landed on Site?

No; ARP mapping dated between 1940 and 1941 did not document any HE bomb strikes within the Site. Despite this, there is strong evidence that HE bomb strikes impacted nearby, possibly on-Site, and may have impacted the area after 1941, when the ARP maps were produced.

In addition, ARP mapping dated between 1940 and 1941 reveals that multiple IB strikes were documented within the Site's vicinity, with the closest strike 160m to the west. Furthermore, additional IBs may have fallen within the Study Site, however they fell in such large numbers that they were considered ubiquitous and accurate record keeping was either non-existent or perfunctory.

## Is there firm evidence of bomb damage on Site?

No; nevertheless, multiple ruins in post-war mapping located on-Site and within the immediate area is strong evidence that the Site was subjected to bomb damage. The bomb damage mapping did not record bomb damage on-Site, this may be because the maps are dated 1940 to 1941 and the Site may have sustained bomb damage after this date.

## Would a UXB entry hole have been observed and reported during WWII?

Possibly; the Site did comprise industrial facilities during WWII and therefore, it is possible that staff associated with the facilities inspected the Site for UXB entry holes following any raids. However, had there been undeveloped areas within the Site it is possible for a UXB entry hole to have gone unnoticed. Furthermore, had the Site sustained serious bomb damage it is considered plausible for debris to have obscured the UXB entry hole from view.

## Is there any reason to suspect that live firing or military training may have occurred at this location?

No; there is no supporting evidence to suggest that five firing occurred. However, an explosives factory was situated within the Site during WWI and therefore, explosive materials, shells and charges would have been produced and/or stored within the Study Site.

## What is the expected level of UXO contamination?

The most likely source of UXO contamination is from *German* aerially delivered ordnance, which ranges from small IBs through to large HE bombs (the latter forms the principal threat). Additional residual contamination may be present from *British* AAA projectiles (which were used to defend the UK against *German* bombing raids). Furthermore, the fact that WWI explosives factory was situated within the Site would suggest that there is a contamination risk associated with this factory, which could include explosive materials, shells and/or charges as AXO.

# STAGE THREE – DATA ANALYSIS (…continued)

## Would previous earthwork have removed the potential for UXO to be present?

Possibly; from an analysis of the post-WWII mapping associated with the Site, the following phases of Site activity were evident:

**1948 to 1950 OS Map –** The iron works along the southern boundary appear to have been redeveloped and in the Site's centre a large industrial building had been constructed. Furthermore, a canteen had been constructed within the Site's northwestern sector;

**1964 to 1967 OS Map –** Large areas of housing had been removed from the Site's southwestern sector;

**1975 to 1990 OS Map –** All of the houses had been removed from the Site's southwestern sector and were replaced with a large industrial building;

**1992 OS Map –** The Study Site had been subjected to major re-development and it appeared that buildings had been removed and replaced with large buildings along the Site's northern boundary. Additional works and structures had been erected along the Site's northern boundary. Nonetheless, the Site's centre remained undeveloped, although may have been subjected to hardstanding;

On this evidence, it is apparent that the Site has been subjected to significant post-WWII redevelopment. As a result, it is highly likely that any UXO within the structural footprint of post-war structures would have been discovered and removed, however, the potential threat of buried UXO to be present below this level of previously disturbed ground is assessed to remain extant.

Furthermore, original historical buildings are shown within the Site's eastern sector, including the location of the WWI explosives factory and therefore, the probability of contamination associated with AXO within this factory has not necessarily been mitigated by post-war redevelopment.

## Does the probability of a UXO discovery vary across the Site?

Yes; the probability of discovering UXO has been mitigated within post war previously disturbed ground. However, it is possible that buried UXO might be present below this level furthermore, several areas within this Site have remained the same hitherto WWII.

# STAGE FOUR – RISK ASSESSMENT

## Threat Items

The most probable UXO threat items are *German* HE bombs, whilst IBs and *British* AAA projectiles pose a residual threat. The consequences of initiating *German* HE bombs are more severe than initiating IBs or AAA projectiles, and thus they pose the greatest prospective risk to intrusive works. Furthermore, the fact that WWI explosives factory was situated within the Site would suggest that there is a contamination risk associated with this factory, which could include explosive materials, shells and/or charges as AXO.

## Maximum Bomb Penetration Depth

Considering the ground conditions (highlighted in Stage 1), the average BPD for a 250kg *German* HE bomb is assessed to be approximately 7m bgl, with the maximum BPD considered to be approximately 16m bgl. Although it is possible that the *Luftwaffe* deployed larger bombs in the area, their deployment was infrequent, and to use such larger (or the largest) bombs for BPD calculations are not justifiable on either technical or risk management grounds.

WWII *German* bombs have a greater penetration depth when compared to IBs and AAA projectiles, which are unlikely to be encountered at depths greater than < 1m bgl.

## Risk Pathway

Given the types of UXO that might be present on Site, all types of aggressive intrusive engineering activities (i.e. groundworks) may generate a significant risk pathway. Whilst not all UXO encountered aggressively will initiate upon contact, such a discovery could lead to serious impact on the project especially in terms of critical injury and project delay.

## Prospective Consequences

Consequences of UXO initiation include:

1. Fatally injure personnel;
2. Severe damage to plant and equipment;
3. Deliver blast and fragmentation damage to nearby buildings;
4. Rupture and damage underground utilities/services.

Consequences of UXO discovery include:

1. Delay to the project and blight;
2. Disruption to local community/infrastructure;
3. The expenditure of additional risk mitigation resources and EOD clearance;
4. Incurring additional time and cost.

# UXO RISK CALCULATION

## Site Activities

Although there is some variation in the probability of encountering and initiating items of UXO when conducting different types of intrusive activities, a number of investigative and construction methodologies have been described for analysis at this Site. The consequences of initiating UXO vary greatly, depending upon, *inter alia* the mass of HE in the UXO and how aggressively it might be encountered. For this reason, 6 Alpha has conducted separate risk rating calculations for each investigative and construction methodology that might be employed.

## Risk Rating Calculation

6 Alpha's Semi-Quantitative Risk Assessment assesses and rates the risks posed by the most probable threat items when conducting a number of different activities on the Site. Risk Rating is determined by calculating the probability of encountering UXO and the consequences of initiating it.

## STAGE FOUR - RISK ASSESSMENT (…continued)

### UXO RISK CALCULATION TABLE – ALL AREAS

| Activity | Threat Item | Probability (SHxEM=P) | Consequence (DxPSR=C) | Risk Rating (PxC=RR) |
|---|---|---|---|---|
| **Trial Pits** | HE Bombs | 2x1=2 | 2x3=6 | 2x6=12 |
| | AAA Projectiles | 1x1=1 | 3x1=3 | 1x3=3 |
| | IBs | 2x1=2 | 3x1=3 | 2x3=6 |
| | AXO | 2x1=2 | 2x2=4 | 2x4=8 |
| **Trenching (<2m bgl)** | HE Bombs | 2x2=4 | 2x3=6 | 4x6=24 |
| | AAA Projectiles | 1x2=2 | 3x1=3 | 2x3=6 |
| | IBs | 2x2=4 | 3x1=3 | 4x3=12 |
| | AXO | 2x2=4 | 2x2=4 | 4x4=16 |
| **Vibrating Columns (<4m bgl)** | HE Bombs | 2x2=4 | 3x2=6 | 4x6=24 |
| | AAA Projectiles | 1x2=2 | 3x1=3 | 2x3=6 |
| | IBs | 2x2=4 | 3x1=3 | 4x3=12 |
| | AXO | 2x2=4 | 3x1=3 | 4x3=12 |

Abbreviations – Site History (SH), Engineering Methodology (EM), Probability (P), Depth (D), Consequence (C), Proximity to Sensitive Receptors (PSR) and Risk Rating (RR).

# STAGE FIVE – RECOMMENDED RISK MITIGATION MEASURES

## If a geophysical survey is required are the ground conditions an issue?

**Non-Intrusive Methods of Mitigation** – Magnetometer results may be affected by ferro-magnetic contamination due to previous construction activities and made ground within the Site.

**Intrusive Methods of Mitigation** – Intrusive magnetometry may be effective on this Site, prior to boreholing and piling in particular. However, any ferrous metal/red brick contamination in made ground/old foundations may affect the detection capability of the UXB survey equipment, as it passes through the contaminated layer especially. Nonetheless, beyond the contaminated strata such a survey should prove effective.

## MITIGATION MEASURES TO REDUCE RISK TO 'ALARP'

| Activity/Area | Risk Mitigation Measures | Final Risk Rating |
|---|---|---|
| **All Activities in All Areas** | 1. **Operational UXO Risk Management Plan;** appropriate Site Management documentation should be held on Site to guide and plan for the actions which should be undertaken in the event of a suspected or real UXO discovery, (this plan can be supplied by 6 Alpha);<br>**2. UXO Safety & Awareness Briefings;** the briefings are essential when there is a possibility of explosive ordnance encounter and are a vital part of the general safety requirement. All personnel working on the Site should receive a briefing on the identification of a UXB, what actions they should take to keep people and equipment away from such a hazard and to alert Site management. Information concerning the nature of the UXB threat should be held in the Site office and displayed for general information on notice boards, both for reference and as a reminder for ground workers. The safety awareness briefing is an essential part of the Health & Safety Plan for the Site and helps to evidence conformity with the principles laid down in the CDM regulations 2015, (this brief can be supplied by 6 Alpha). | **ALARP** |
| **All Trial Pits, Trenching and demolition of relic buildings** | **3. EOD Banksman Support;** EOD Engineer to survey and/or supervise the trial pits, trenching and demolition of buildings (to 2m bgl) for UXO and to identify any suspicious items as the work proceeds in the EOD Banksman role, (this service can be provided by 6 Alpha). | |
| **All Vibrating Columns undertaken below previously disturbed ground** | **4. Intrusive Magnetometer Survey;** an intrusive survey (employing down-hole magnetometer or MagCone techniques) ahead of installation of the vibrating columns is strongly recommended. Such a survey should extend to the estimated bomb penetration depth or to the maximum depth of the works, whichever is encountered first, (this service can be provided by 6 Alpha). | |

This assessment has been conducted based on the information provided by the Client, should the proposed works change then 6 Alpha should be re-engaged to refine this risk assessment

# Report Figures

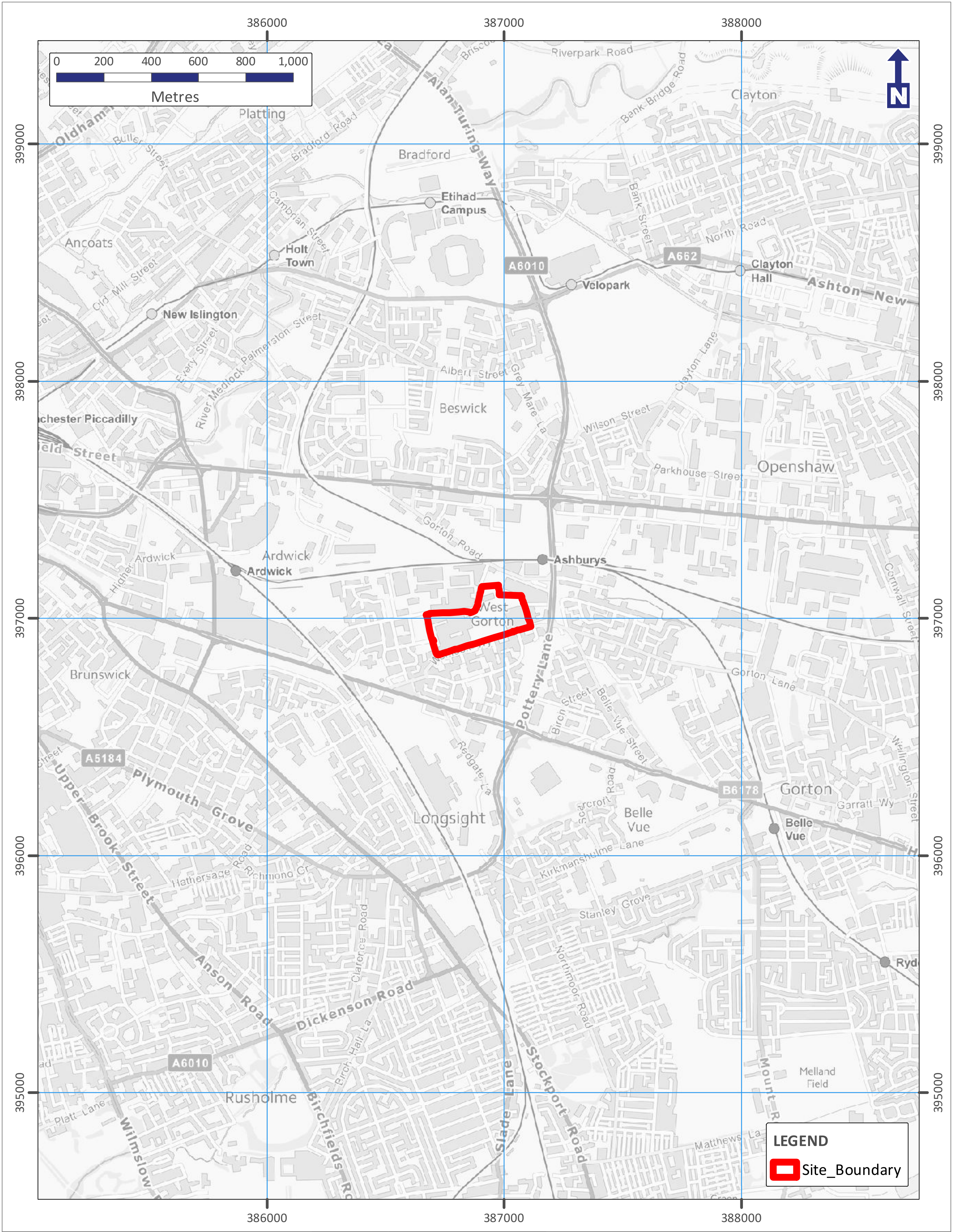
# Figure One

## Site Location

BRITISH NATIONAL GRID

## SITE AT 386930, 397100

# Site Location



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Velopark
A662
Clayton Hall
Ashton New
New Islington
Beswick
Openshaw
Manchester Piccadilly
Ardwick
Ashburys
West Gorton
Brunswick
A5184
Plymouth Grove
Longsight
Belle Vue
Gorton
B6178
Rusholme
Dickenson Road
A6010
Stockport Road
Melland Field
LEGEND
Site_Boundary

| PROJECT NO. | FIGURE NO. | DRAWN BY | CHECKED BY | DATE | | |
|---|---|---|---|---|---|---|
| P4877 | 1 | DR | RR | 12 October, 2015 | Contains Ordnance Survey data © Crown copyright and database right 2015 | Produced by and Copyright to 6 Alpha Associates Ltd. Users noting any errors please notify 6 Alpha. |

# Figure Two

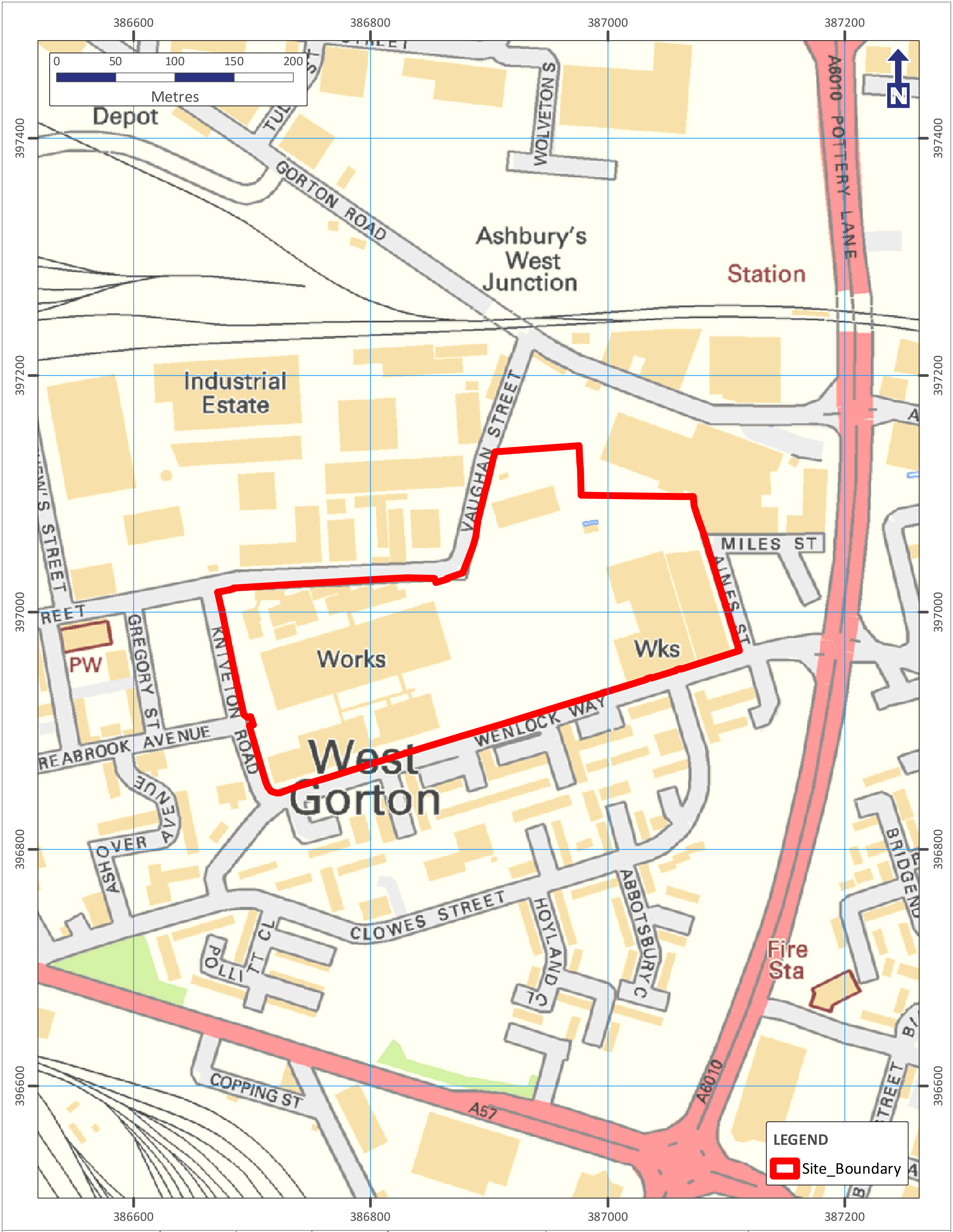
## Site Boundary

BRITISH NATIONAL GRID

# SITE AT 386930, 397100

## Site Boundary

BOMB SEARCH
WWW.6ALPHA.COM



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WOLVETON S
Ashbury's West Junction
Station
A6010 POTTERY LANE
Industrial Estate
VAUGHAN STREET
MILES ST
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GREGORY ST
KNIVETON ROAD
REABROOK AVENUE
WENLOCK WAY
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COPPING ST
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STREET
LEGEND
Site_Boundary

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| P4877 | 2 | DR | RR | 12 October, 2015 | Contains Ordnance Survey data © Crown copyright and database right 2015 | Produced by and Copyright to 6 Alpha Associates Ltd. Users noting any errors please notify 6 Alpha. |

# Figure Three

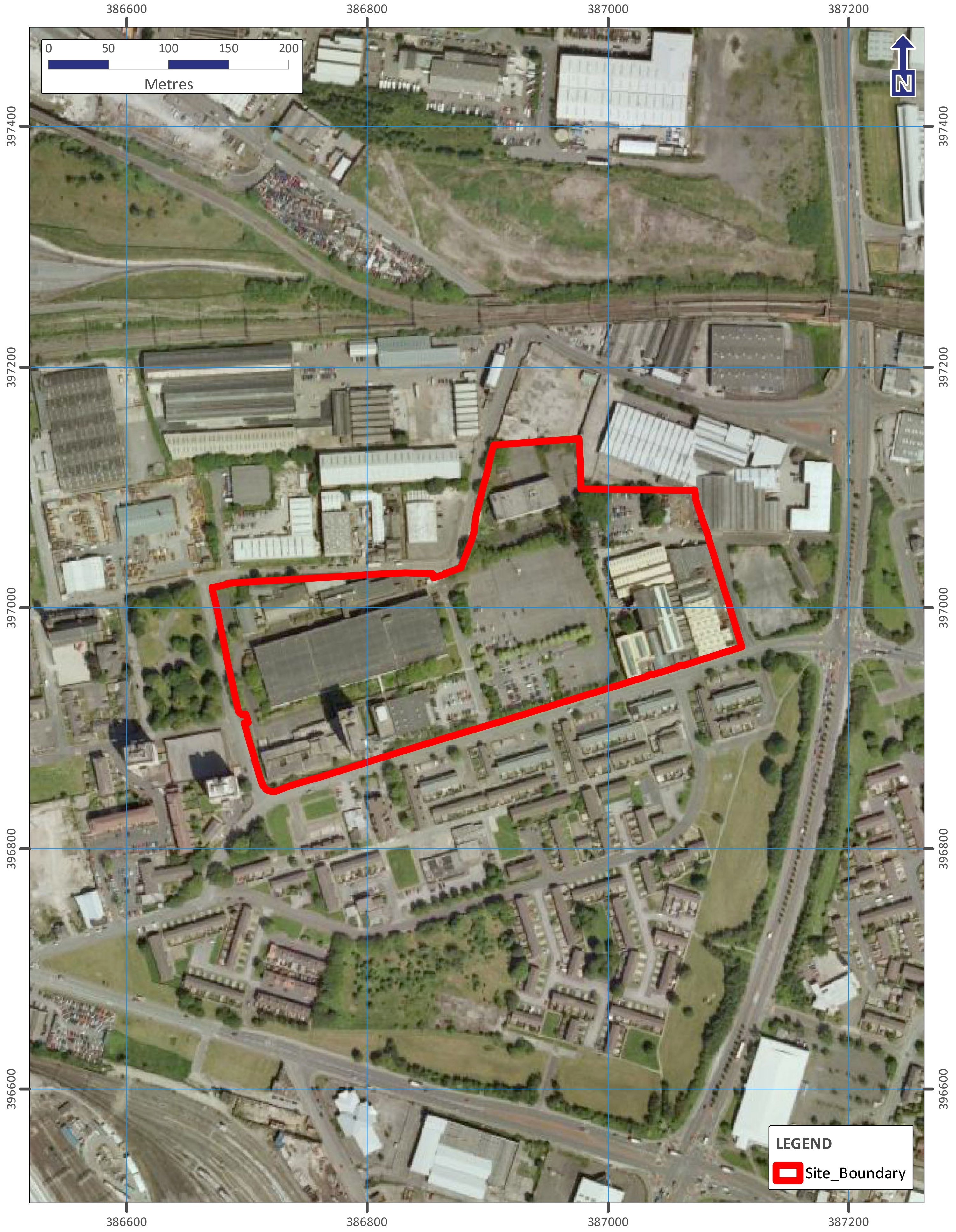
## Aerial Photography (Current)

BRITISH NATIONAL GRID

## SITE AT 386930, 397100

# Aerial Photography (Current)

BOMB SEARCH
WWW.6ALPHA.COM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| PROJECT NO.<br>**P4877** | FIGURE NO.<br>**3** | DRAWN BY<br>DR | CHECKED BY<br>RR | DATE<br>12 October, 2015 | Map data: Google, Infoterra Ltd & Bluesky | Produced by and Copyright to 6 Alpha Associates Ltd. Users noting any errors please notify 6 Alpha. |

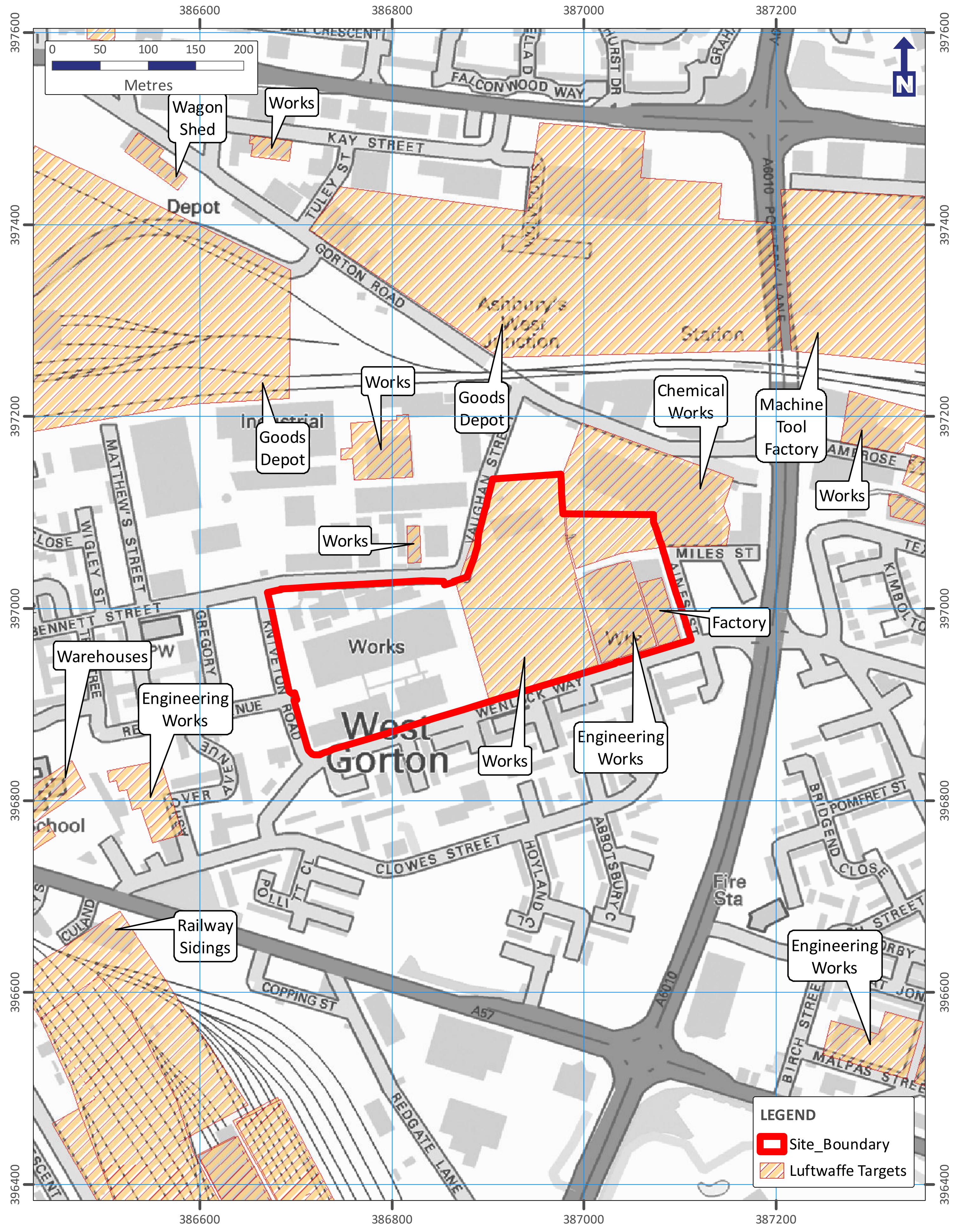
# Figure Four

## WWII Luftwaffe Bombing Targets

BRITISH NATIONAL GRID

# SITE AT 386930, 397100

# WWII Luftwaffe Bombing Targets



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Depot
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FALCONWOOD WAY
TULEY ST
GORTON ROAD
Ashbury's West Junction
Station
A6010 POTTERY LANE
Goods Depot
Works
Goods Depot
Industrial
Chemical Works
Machine Tool Factory
AMBROSE ST
Works
Works
MATTHEW'S STREET
WIGLEY ST
MILES ST
VAUGHAN STREET
BENNETT STREET
GREGORY
KINTEVTON ROAD
Factory
Works
Warehouses
Engineering Works
WENLOCK WAY
West Gorton
Works
Engineering Works
School
CLOWES STREET
POMFRET ST
BRIDGEND CLOSE
HOYLAND CL
ABBOTSBURY C
Fire Sta
Railway Sidings
Engineering Works
COPPING ST
A57
A6010
BIRCH STREET
MALPAS STREET
REDGATE LANE
LEGEND
🟥 Site_Boundary
▨ Luftwaffe Targets

| PROJECT NO. | FIGURE NO. | DRAWN BY | CHECKED BY | DATE |
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| P4877 | 4 | DR | RR | 12 October, 2015 |

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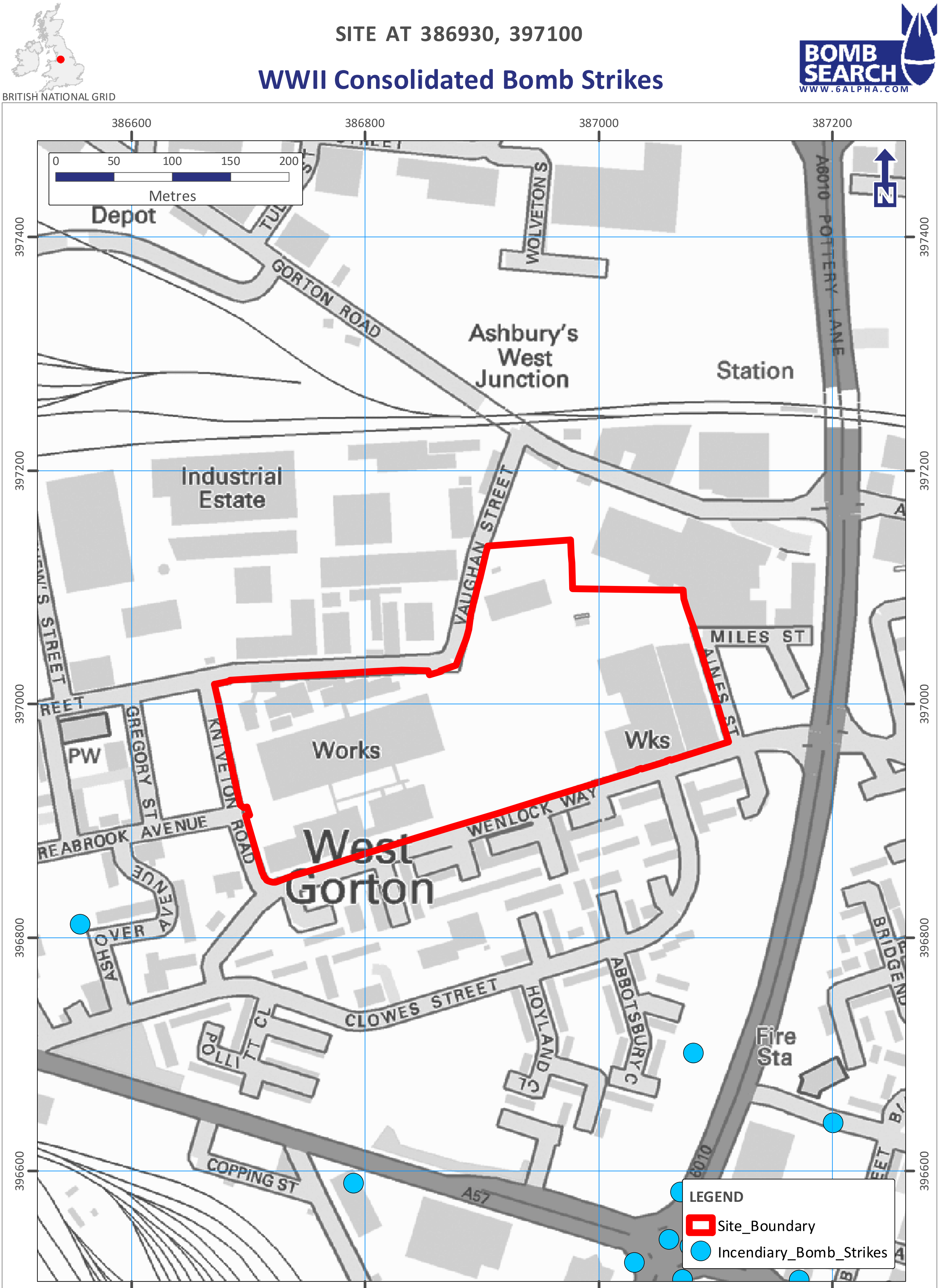
# Figure Five

## WWII Consolidated Bomb Strikes

## SITE AT 386930, 397100

# WWII Consolidated Bomb Strikes


BRITISH NATIONAL GRID
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| PROJECT NO. | FIGURE NO. | DRAWN BY | CHECKED BY | DATE | | |
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| P4877 | 5 | DR | RR | 12 October, 2015 | Contains Ordnance Survey data © Crown copyright and database right 2015 | Produced by and Copyright to 6 Alpha Associates Ltd. Users noting any errors please notify 6 Alpha. |

# Figure Six

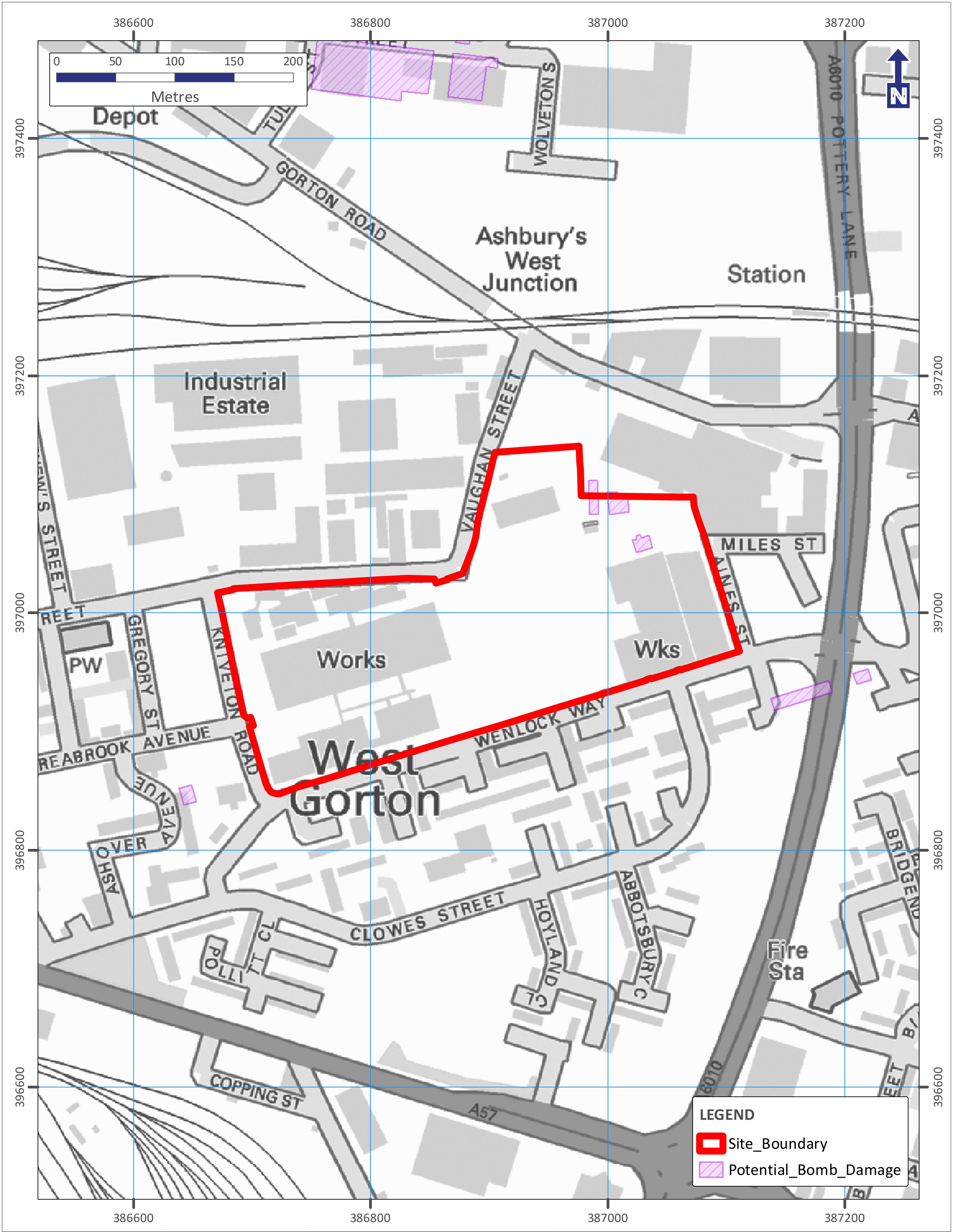
## Areas of Potential WWII Bomb Damage

BRITISH NATIONAL GRID

## SITE AT 386930, 397100

# Areas of Potential WWII Bomb Damage

BOMB SEARCH
WWW.6ALPHA.COM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Ashbury's West Junction
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Industrial Estate
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MILES ST
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GREGORY ST
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| PROJECT NO. | FIGURE NO. | DRAWN BY | CHECKED BY | DATE | | |
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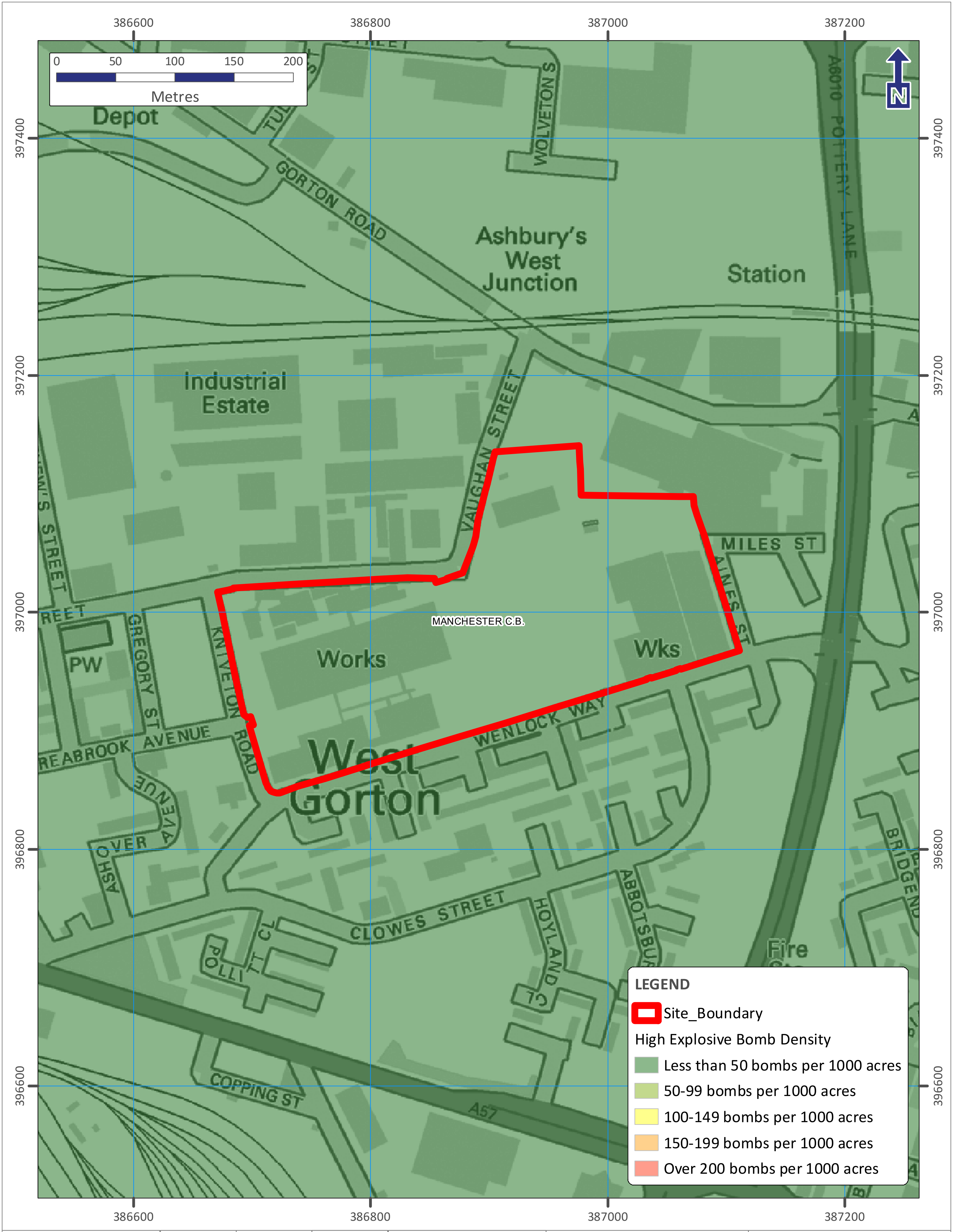
# Figure Seven

## WWII High Explosive Bomb Density

BRITISH NATIONAL GRID

## SITE AT 386930, 397100

# WWII High Explosive Bomb Density



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HOYLAND CL
ABBOTSBURY
POLLITT CL
COPPING ST
A57
BRIDGEND
Fire

LEGEND

🟥 Site_Boundary

High Explosive Bomb Density

🟩 Less than 50 bombs per 1000 acres

🟩 50-99 bombs per 1000 acres

🟨 100-149 bombs per 1000 acres

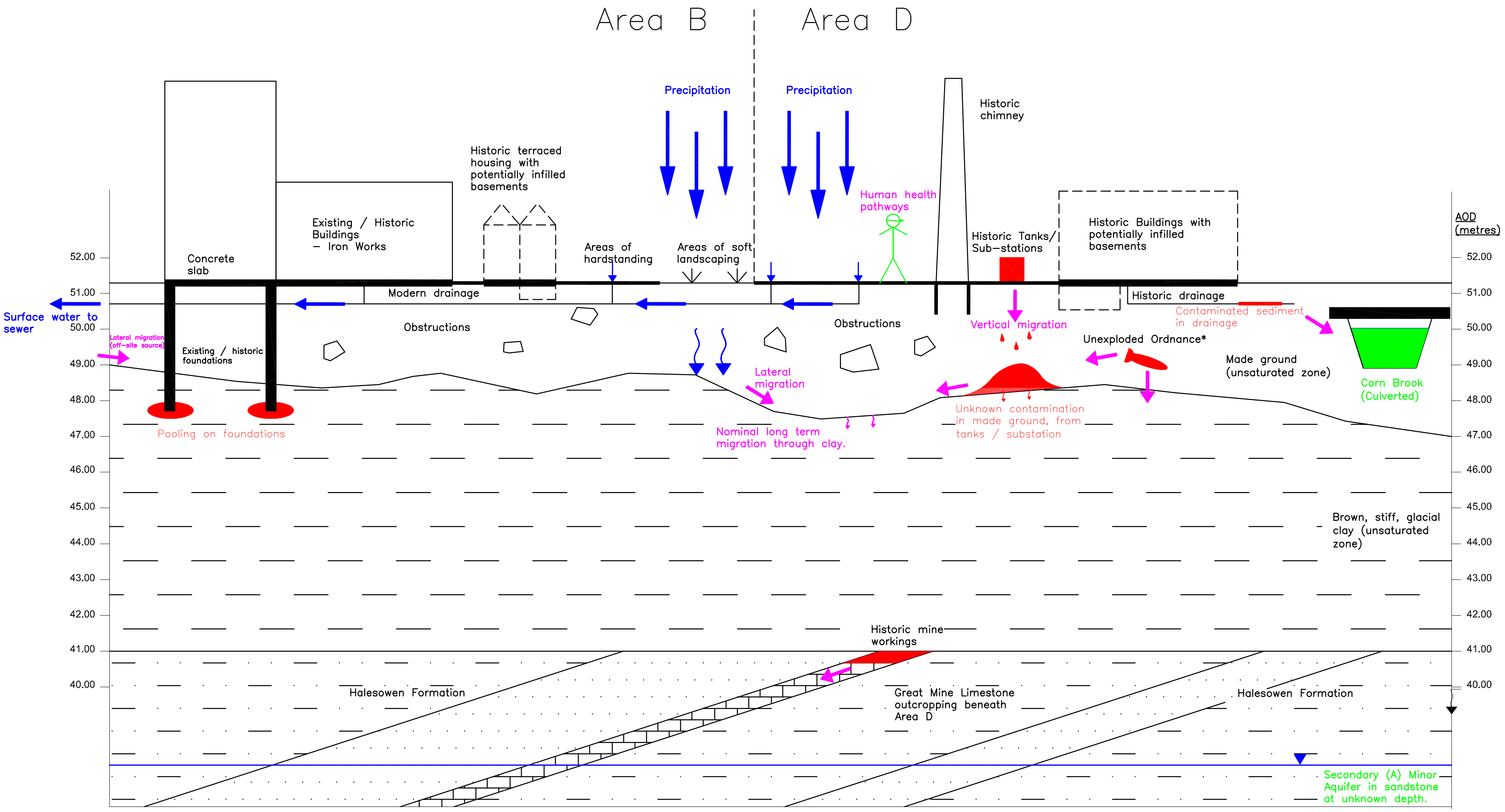
🟧 150-199 bombs per 1000 acres

🟥 Over 200 bombs per 1000 acres

| PROJECT NO. | FIGURE NO. | DRAWN BY | CHECKED BY | DATE | | |
|---|---|---|---|---|---|---|
| P4877 | 7 | DR | RR | 12 October, 2015 | Contains Ordnance Survey data © Crown copyright and database right 2015 | Produced by and Copyright to 6 Alpha Associates Ltd. Users noting any errors please notify 6 Alpha. |

# APPENDIX 10

# DIAGRAM OF CONCEPTUAL MODEL


Area B
Area D
Precipitation
Precipitation
Historic chimney
Human health pathways
Historic terraced housing with potentially infilled basements
Existing / Historic Buildings – Iron Works
Concrete slab
Areas of hardstanding
Areas of soft landscaping
Historic Tanks/ Sub–stations
Historic Buildings with potentially infilled basements
AOD (metres)
52.00
51.00
50.00
49.00
48.00
47.00
46.00
45.00
44.00
43.00
42.00
41.00
40.00
Surface water to sewer
Modern drainage
Historic drainage
Contaminated sediment in drainage
Lateral migration (off–site source)
Existing / historic foundations
Obstructions
Obstructions
Vertical migration
Unexploded Ordnance*
Made ground (unsaturated zone)
Corn Brook (Culverted)
Lateral migration
Pooling on foundations
Nominal long term migration through clay.
Unknown contamination in made ground, from tanks / substation
Brown, stiff, glacial clay (unsaturated zone)
Historic mine workings
Halesowen Formation
Great Mine Limestone outcropping beneath Area D
Halesowen Formation
Secondary (A) Minor Aquifer in sandstone at unknown depth.

## Notes.

1 All dimensions and levels are in metres unless noted otherwise.
2 *Unexploded ordnance is exempt from the environmental assessment.
3 This drawing is to be read in conjunction with all relevant Architects and Service Engineers drawings.

### Sources

- Made ground (On and off–site)
- Contaminative material associated with historic processes e.g. iron works
- Former tanks / substation
- Sediments in historic drainage
- Mine workings
- Unexploded ordnance*
- Secondary Source: Pooling at foundations

### Pathways

- Infiltration pathway: dependent on provision of hardstanding
- Vertical migration: very low risk due to lack of groundwater / infiltration in unsaturated zone
- Lateral migration: dependent on provision of hardstanding and clay gradient
- Potential historic drainage and historic discharge into Corn Brook
- Human health pathways: dermal, ingestion or inhalation
- Migration along potential mine workings

### Receptors

- Surface Waters: Corn Brook (culverted)
- Groundwater: Secondary (A) (minor) aquifer
- Human Health: Construction workers, site occupants, end users and general public

### Gaps In Knowledge

- Existence of historic drainage
- Gradient of clay layer
- Exact location of historic tanks
- Nature of made ground
- Presence and depth of perched water from infilled pond and possible contamination
- Depth of groundwater

| Rev | Drawn | Date | Description |
|---|---|---|---|
| | | | |

Drawing Status
INFORMATION

Contract
THE SPACE PROJECT, PHASE 2, GORTON

Drawing Title
CONCEPTUAL SITE WATERS MODEL

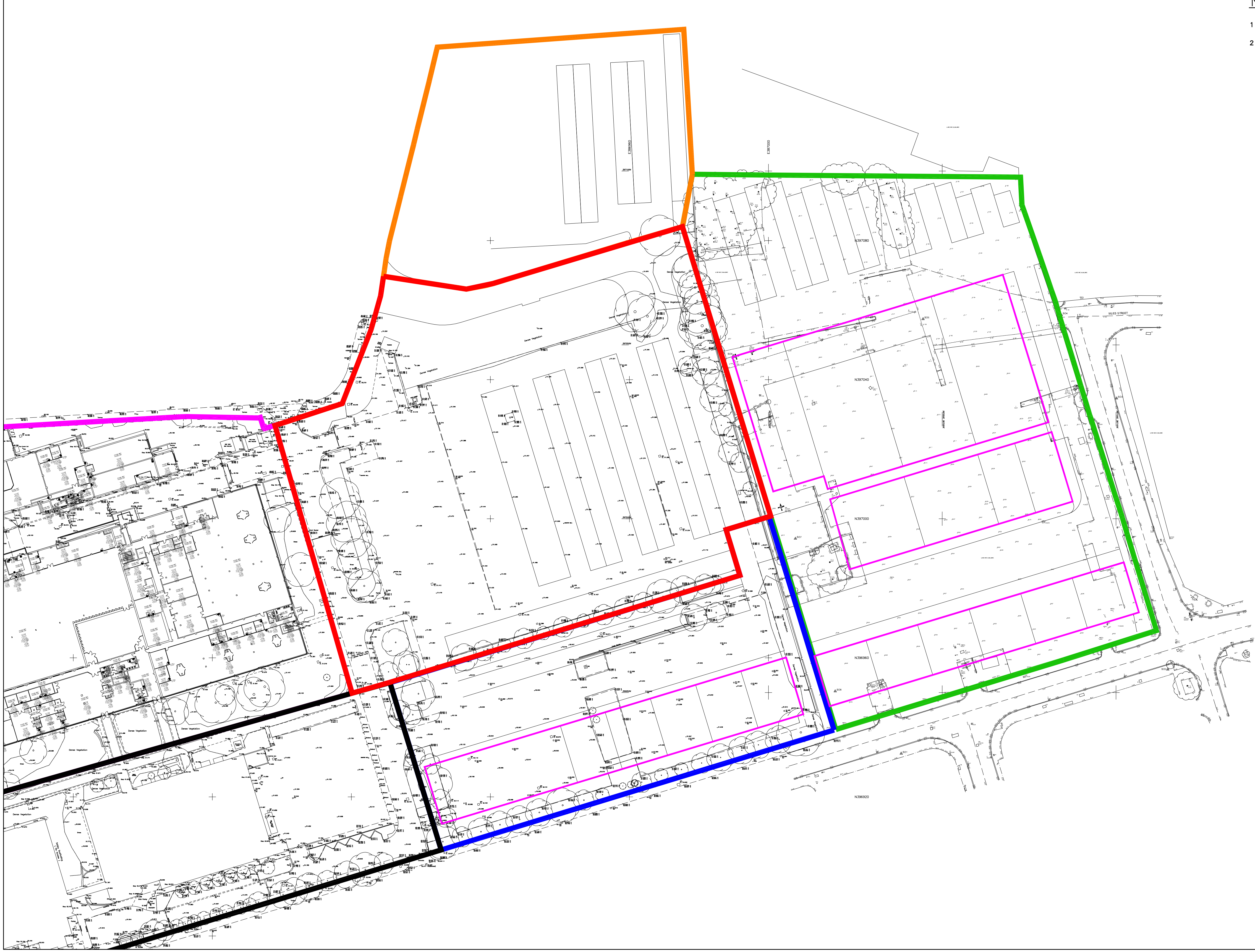
**Integra**
**consulting**
**environmental**

Suite 4, 14-32 Hewitt Street, Manchester, M15 4GB
email: manchester@integraconsulting.co.uk
web: www.integraconsulting.co.uk
tel: 0161 237 9310

| | |
|---|---|
| Scales N.T.S | Date OCT 2015 |
| Drawn MC | Checked AE |
| Contract No 2898 | Drawing No SI–03 P1 |

# APPENDIX 11

# PROPOSED DEVELOPMENT PLAN



## Notes.

1 All dimensions and levels are in metres unless noted otherwise.

2 This drawing is to be read in conjunction with all relevant Architects and Service Engineers drawings.

## Legend

🟪 Proposed Building Envelopes

| Rev | Drawn | Date | Description |
|---|---|---|---|

**Drawing Status**
INFORMATION

**Contract**
SPACE PROJECT, WEST GORTON, MANCHESTER

**Drawing Title**
PROPOSED DEVELOPMENT PLAN OVERLAY UPON EXISTING

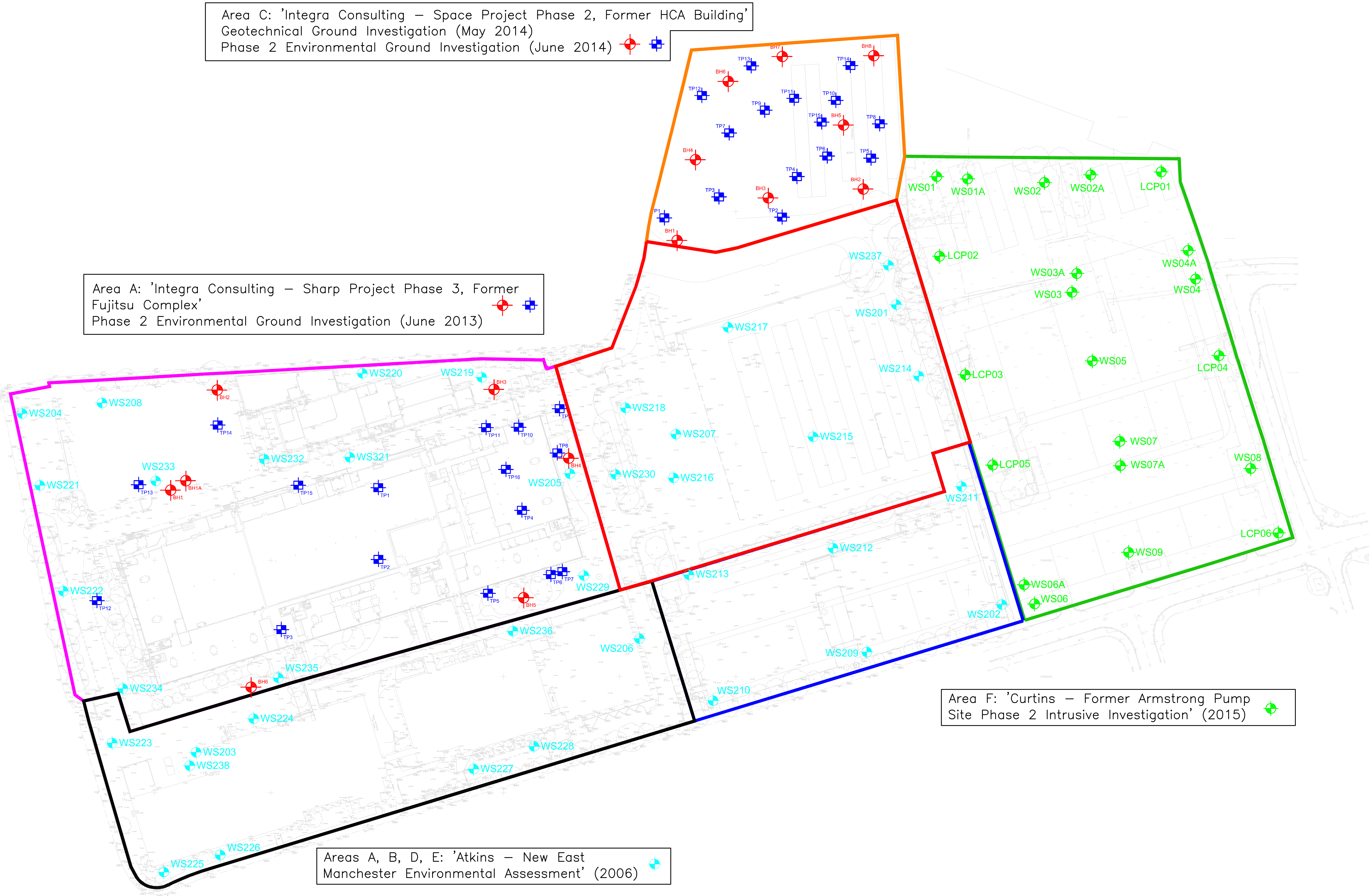
**Integra**
**consulting**
**environmental**

**Suite 4, 14-32 Hewitt Street, Manchester, M15 4GB**
**email: manchester@integraconsulting.co.uk**
**web: www.integraconsulting.co.uk**
**tel: 0161 237 9310**

| | |
|---|---|
| **Scales** 1:1000@A1 | **Date** OCT 2015 |
| **Drawn** MC | **Checked** AE |
| **Contract No** 2913 | **Drawing No** SI–04 P1 |

# APPENDIX 12

## COMPOSITE PREVIOUS SITE INVESTIGATION EXPLORATORY HOLE LOCATION PLAN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WS01A
WS02
WS02A
LCP01
LCP02
WS03A
WS03
WS04A
WS04
WS05
LCP03
LCP04
WS07
WS07A
LCP05
WS08
LCP06
WS09
WS06A
WS06
BH1
BH2
BH3
BH4
BH5
BH6
BH7
BH8
TP1
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WS216
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WS212
WS213
WS202
WS209
WS210
WS206
WS220
WS219
BH3
WS208
WS204
BH2
TP14
TP
TP11
TP10
WS232
WS321
TP8
BH4
WS233
BH1A
BH1
TP13
WS221
TP15
TP1
TP16
WS205
TP4
TP2
WS222
TP12
TP6
TP7
WS229
TP5
BH5
TP3
WS236
WS235
WS234
BH6
WS224
WS223
WS203
WS238
WS228
WS227
WS226
WS225

Area C: 'Integra Consulting – Space Project Phase 2, Former HCA Building'
Geotechnical Ground Investigation (May 2014)
Phase 2 Environmental Ground Investigation (June 2014)

Area A: 'Integra Consulting – Sharp Project Phase 3, Former Fujitsu Complex'
Phase 2 Environmental Ground Investigation (June 2013)

Area F: 'Curtins – Former Armstrong Pump Site Phase 2 Intrusive Investigation' (2015)

Areas A, B, D, E: 'Atkins – New East Manchester Environmental Assessment' (2006)

## Notes.

1 All dimensions and levels are in metres unless noted otherwise.

2 This drawing is to be read in conjunction with all relevant Architects and Service Engineers drawings.

## Legend

WS – Window Sample
TP – Trial Pit
BH – Borehole (Shell and Auger
LCP – Light Cable Percussion

| Rev | Drawn | Date | Description |
|---|---|---|---|
| | | | |

Drawing Status
INFORMATION

Contract
SPACE PROJECT,
WEST GORTON,
MANCHESTER

Drawing Title
COMPOSITE PREVIOUS SITE INVESTIGATION EXPLORATORY HOLE LOCATION PLAN

**Integra**
**consulting**
**environmental**

Suite 4, 14-32 Hewitt Street, Manchester, M15 4GB
email: manchester@integraconsulting.co.uk
web: www.integraconsulting.co.uk
tel: 0161 237 9310

| | |
|---|---|
| Scales 1:625@A1 | Date OCT 2015 |
| Drawn MC | Checked AE |
| Contract No 2913 | Drawing No SI–05 P1 |

# APPENDIX 12

# INTEGRA CONSULTING PHASE 3 GEO-ENVIRONMENTAL REPORT (2015)

# Wenlock Tower Complex, West Gorton

## Phase 2 Environmental Ground Investigation

For: Manchester City Council

Multidisciplinary Environmental Consultants

Integra Consulting Environmental
Suite Four
14-32 Hewitt Street
Manchester
M15 4GB

Tel 0161-237-9310
Fax 0161-237-3635
Email environmental@integraconsulting.co.uk

Ref: 2913-05
Job: 2913
Rev: A
By: JG

Date: May 2017

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1.0 INTRODUCTION

2.0 BRIEF

3.0 LIMITATIONS OF INVESTIGATION WORK AND REPORT

4.0 THIRD PARTIES

5.0 SCOPE OF INVESTIGATION WORK

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- 6.2 Ground Conditions
- 6.3 Chemical Laboratory Tests
- 6.4 Chemical Test Results
- 6.5 Ground Gas
- 6.6 Groundwater Depth Monitoring

7.0 REVISED CONCEPTUAL MODELS

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- 7.3 Revised Conceptual Model for Controlled Waters Risk Assessment

8.0 RECOMMENDATIONS

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| APPENDIX 2 | EXPLORATORY HOLE LOCATION PLAN |
| APPENDIX 3 | WINDOW SAMPLE LOGS AND PHOTOGRAPHS |
| APPENDIX 4 | LABORATORY CHEMICAL TEST RESULTS |
| APPENDIX 5 | GROUND GAS AND GROUNDWATER DEPTH MONITORING RESULTS |
| APPENDIX 6 | REVISED CONCEPTUAL SITE MODEL DIAGRAM |

## 1.0 INTRODUCTION

This Phase 2 Environmental Investigation report has been prepared at the request of Manchester City Council. Instructions to proceed with this report were received in April 2017.

A Phase 2 intrusive environmental ground investigation has been undertaken at the site off Wenlock Way, West Gorton, Manchester and follows the Integra Consulting Phase 1 Geo-Environmental Ground Investigation (October 2015). The information obtained during the Phase 1 investigation has been used to scope the Phase 2 investigation.

The site is part of the wider Space Project masterplan as covered by the Phase 1 Geo-Environmental Ground Investigation report.

The site extends approximately 0.8 hectares and the national Ordnance Survey (OS) grid location of the centre of the site is E386779, N396894. The wider area covered by the Space Project masterplan is shown on the aerial photograph and the site location plans in Appendix 1.

This Phase 2 Environmental Investigation report is to be used for submission to the Local Authority, as it is the Client's intention to develop the site into commercial buildings associated with the Space Project studios.

No proposed development plan has been produced to date. Consequently, reappraisal / reassessment of the conclusions and recommendations of this report may be required subject to the final proposed development plan.

It should be noted that the site location plans contained within Appendix 1 relate to both the wider site and the site of interest.

This report has been designated as Revision A following the final 2 No. gas monitoring visits. The recommendation and conclusions have been updated accordingly.

## 2.0 BRIEF

The brief was to carry out an intrusive environmental ground investigation for the site off Wenlock Way, West Gorton, based upon the proposed development outlined in Section 1.0 following the findings and recommendations of the Phase 1 Geo-environmental Investigation report.

The investigation was to include the following tasks:

a) Collect appropriate samples from exploratory holes and arrange appropriate chemical testing, solid, leachate and / or liquid where appropriate, in accordance with the latest legal framework and record olfactory and / or visual evidence of contamination during intrusive works;

b) Identify any ground contamination from natural sources and past activities present at the site (including potential ground gas contamination) and the nature and extent of the contaminants;

c) Revise the conceptual models noted within the Phase 1 Geo-Environmental Investigation Report to accommodate the findings of the site investigation works in terms of the risk to human health, controlled waters and the wider environment; and

d) Identify the risks and evaluate whether a Phase 3 numerical risk assessment and / or a Remedial Strategy, is required.

A detailed report was to be provided to summarise the findings and recommendations.

## 3.0 LIMITATIONS OF INVESTIGATION WORK AND REPORT

### Exploratory Holes

The locations of the exploratory holes for the ground investigation have been derived to provide a reasonable indication of the ground conditions and any contaminants, if present but has ultimately been limited by commercial constraints. The findings from the exploratory holes relate specifically to the exploratory hole locations and there is no absolute guarantee of the ground conditions and extent of contamination between the locations.

### Extent of Contamination Testing

The extent of contaminated land testing carried out on samples obtained from the site has been determined in accordance with the latest legal guidance issued by the government to provide, with reasonable certainty, the probable general levels of contamination present on site that could pose a significant hazard to human health or waters. The extent of site investigation works including chemical testing has also been limited by reasonable commercial constraints. Although extensive testing of samples has been carried out, the volume of samples taken for testing are a minute fraction of the total volume of soils and groundwater present on site. Therefore, there is a residual risk that undetected pockets of contamination may be present on site, situated between testing locations.

When investigating or developing potentially contaminated land it is important to recognise that sub-surface conditions may vary spatially and temporally. The absence of certain ground, ground gas, contamination or groundwater conditions at the positions tested is not a guarantee that such conditions do not exist anywhere across the site. Due to the presence of existing structures, access could not be obtained to all areas. Additional contamination may be identified following the removal of the hardstanding. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities. The conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full. The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the site.

### Extent of Contamination Studies

This report is strictly limited to the nature of contamination contained within the ground and groundwater at the site. The report does not cover environmental aspects such as air or noise pollution and ground vibrations and the like. In addition, ecological matters relating to wildlife, flora and fauna have not been investigated as part of this report. In particular, the site has not been inspected for the presence or otherwise of invasive species e.g. Japanese Knotweed. It is recommended that the Client appoints a specialist in this subject to carry out a detailed inspection / survey of the site if its presence is suspected. Where mention has been made to the identification asbestos or asbestos-containing materials this is for indicative purposes only and does not constitute or replace a full and proper survey. If an Unexploded Ordnance (UXO) report has been obtained within the report, it has been so on the basis of Health and Safety concerns and no assessment has been made other than transcribing the recommendations of the sub-contractor contained within the report. In terms of a potential contaminative source, unless ordnance has been manufactured / stored on site, UXOs will only be determined as a contaminative source following a positive identification on site.

### Geotechnical Investigation

This report does not cover aspects of the ground relating to its geotechnical properties or suitability to support buildings, structures, roads, sewers and the like.

## 4.0 THIRD PARTIES

This report has been prepared for the sole use of Manchester City Council. The report must not be copied or passed onto any third party or used for any purpose other than which it was prepared without the permission of the author. This report is copyright.

## 5.0 SCOPE OF INVESTIGATION WORK

Site based work and laboratory testing was undertaken between the 12th April and 9th May consisting of 10 No. window sample holes and associated chemical laboratory testing.

Drilling of window sample holes and associated installation of ground gas and groundwater monitoring wells was carried out by Geo Site Surveys Ltd. Testing of soil samples for environmental purposes was carried out by Chemtest Ltd. in accordance with the Environment Agency's MCERTS (Monitoring Certification) quality assurance accreditation scheme. Both organisations were appointed directly by Integra Consulting Environmental to carry out these contracting works.

The sampling strategy for the site has been completed in accordance with CLR4 and the design of the investigation was carried out in accordance with R&D Technical Report P 5-TR066, CLR 11, BS:8485 (2015) and BS:10175 (2011). All exploratory hole logs were recorded in line with BS:5930 (2015).

As a result of the preliminary risk assessment as outlined in the Phase 1 Geo-environmental report, the Phase 2 intrusive environmental ground investigation was carried out to quantify the identified risks.

A specific location of potential contamination was identified in the Phase 1 Geo-environmental report relating to an area of elevated soil hydrocarbon concentrations detected in a previous SI on the site carried out by Atkins (2006). WS02 and WS02A were undertaken specifically to target this area.

A previous site investigation by Integra Consulting (2013) was also obtained which relates to land immediately to the north of the site.

All other exploratory holes were arranged spatially for the following environmental purposes:

- To broadly target and characterise the made ground and natural superficial deposits;
- To obtain soil samples for environmental testing; and
- To facilitate the installation of wells for gas and groundwater depth monitoring and groundwater sampling for chemical testing purposes.

Various asbestos containing materials (ACMs) were identified by the specialist consultant AEC across the interior of the on-site buildings. Consequently, as a result of discussions with AEC, a number of interior areas were deemed inaccessible due to the corresponding health and safety risk. These areas are highlighted on the Exploratory Hole Location Plan contained in Appendix 2.

### Window Samples

10 No. window sample holes were constructed to depths of between 0.4m and 3.5m bgl (51.4m and 48.4m AOD) to establish the thickness, extent and characteristics of the underlying made ground and natural superficial deposits, to obtain sleeve samples from these deposits for classification and laboratory testing and to allow for the installation of ground gas and groundwater monitoring wells.

WS02A was undertaken as a replacement for WS02 to attempt to penetrate further into the very stiff clay encountered at 3m bgl. Following on from the first window sample hole undertaken (WS02), sleeve samples were used to improve recovery.

WS06A was undertaken as a replacement for WS06 to attempt to avoid the obstruction encountered at 0.4m bgl.

Window sample works were carried out on 12th and 13th April 2017. Their locations are shown on the exploratory hole location plan in Appendix 2 and the window sample logs and associated photographs are contained in Appendix 3.

Installations

Standpipes were installed in WS02A, WS05, WS07 and WS08 for the purposes of ground gas and groundwater depth monitoring as detailed in Section 6.6.

| Monitoring Well | Response Zone | |
|---|---|---|
| | (m bgl) | (m AOD) |
| WS2A | 1.0 to 3.0 | 50.45 to 48.45 |
| WS05 | 1.0 to 3.0 | 51.10 to 49.10 |
| WS07 | 1.0 to 3.0 | 51.00 to 49.00 |
| WS08 | 1.0 to 3.0 | 51.00 to 49.00 |

Each window sample hole was constructed in accordance with the Environment Agency's Guidance on Monitoring of Landfill Leachate, Groundwater and Surface Water (2002).

# 6.0 FINDINGS AND CONCLUSIONS

## 6.1 Visual and Olfactory Contamination Findings

During the intrusive exploratory hole investigation works, the soils were examined carefully for both visual and olfactory evidence of contamination. Evidence of contamination was identified in a single location:

- WS04 between 0.30m and 1.20m bgl – gravel sized fibrous material was identified within the material.

## 6.2 Ground Conditions

The ground conditions encountered during the intrusive site investigation have determined that the site was typically underlain by:

- Tarmacadam to a depth of 0.1m bgl, underlain by:
- Sub-base comprising yellowish grey, subangular to subrounded, fine to coarse gravel (suspected sub-base) to a depth of 0.5m bgl, underlain by:
- Made Ground comprising brown, mottled black, gravelly, clayey sand or gravelly, sandy clay to a depth of 1.5m bgl, underlain by:
- Natural Glacial Till comprising:
    - Soft to firm, grey, slightly gravelly, slightly silty clay to a depth of 1.80m bgl.
    - The glacial till becomes stiff to very stiff, friable, brown, mottled grey, slightly gravelly, slightly sandy, silty clay to termination at 3.5m bgl.

Exceptions to the above typical ground conditions include:

- WS04 and WS05 which recorded grassed topsoil to a depth of 0.1m bgl in place of the tarmacadam and sub-base recorded above; and
- WS07 and WS08 which recorded 0.23m and 0.3m respectively of concrete in place of the tarmacadam recorded above.

## 6.3 Chemical Laboratory Tests

Soil and groundwater samples were collected during intrusive site works. These samples were placed into appropriate glass sterile sealed containers to facilitate MCERTS chemical laboratory testing of potential contaminants.

Chemical testing suites were based upon the possible contaminative sources identified within the Phase 1 Geo-Environmental Investigation Report.

A total of 15 No. solid chemical tests and 3 No. groundwater samples were undertaken across the site, of which the following subdivisions have been made:

- 3 No. solid chemical tests from the sub-base material;
- 9 No. solid chemical tests from the made ground;
- 3 No. solid chemical tests from the natural glacial till;
- 2 No. groundwater samples from within the underlying Secondary Aquifers; and
- 1 No. groundwater sample from suspected perched water within the made ground.

The results of the laboratory tests undertaken on the solid and groundwater samples outlined above are contained in Appendix 4 and the concentrations of contaminants are summarised in Section 6.4.

## 6.4 Chemical Test Results

The findings of the chemical test results, summarised below, will be assessed against generic assessment criteria (GAC) for the purposes of screening allowable concentrations in 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. end-users, construction workers and the general public) via measured solid concentrations; and

- The water environment (e.g. groundwater and surface water) via measured water concentrations.

Additional receptors may be relevant dependant on the site e.g. flora/fauna, water supply pipes, buried concrete.

The GAC adopted for assessment of soils in relation to Human Health are based on published Soil Guideline Values (SGV) in 2009 for those compounds for which published criteria are available for varying scenarios (residential, commercial, allotment). In the absence of SGVs the following GAC defining documents are adopted - LQM/CIEH S4ULs (2015), CL:AIRE Soil GAC for Human Health Assessment (2010) and Category 4 Screening Levels (C4SLs) (2014).

The primary risk to human receptors from free cyanide in soils is an acute risk (i.e. a single dose could have a lethal affect as opposed to adverse effects from cumulative intake (chronic affect)). There is no current UK guidance available for calculating acute risks from free cyanide, therefore an in-house methodology has been used to derive an acute GAC of 60 mg/kg for all exposure scenarios. The value is given for Free or Easily Liberatable Cyanide but should be used to assess Total Cyanide in the absence of cyanide speciation. In cases where the Total Cyanide exceeds the GAC then analysis for Free or Easily Liberatable Cyanide should be completed.

GACs 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. GACs utilised include - The River Basin Districts Typology, Standards and Groundwater threshold values (Water Framework Directive) (England and Wales) Directions 2009 (Part 7:Groundwater Threshold Values), UK Drinking Water Standards (2000), Environmental Quality Standards, World Health Organisation concentrations, Environment Agency guidance concentrations and United States Environmental Protection Agency – Region 9 GACs.

## Solid Samples

Summary tables indicating the results, assessed against their relevant GACs (commercial land use scenario), are noted below. Given the identified ground conditions, the assessment has been separated into the following 3 No. major strata types:

- Sub-base material;
- Bulk made ground material; and
- Natural glacial till.

| Solid Contamination Results – Sub-Base Material | | | | | |
|---|---|---|---|---|---|
| **Determinand** | **WS02A 0.0-0.4m bgl** | **WS07 0.25-1.0m bgl** | **WS02A 0.0-0.4m bgl (re-test)** | **GAC** | **Exceeded Allowable** |
| **Inorganics, Carbon and Asbestos** | | | | | |
| Asbestos Quantification | None Recorded | | - | - | - |
| Sulphate (2:1 Water Soluble) as SO4 (g/l) | 0.021 | 0.310 | <0.010 | - | - |
| Nitrate (Water Soluble) (g/l) | <0.010 | <0.010 | <0.010 | - | - |
| Cyanide (Free) | <0.50 | <0.50 | <0.50 | 60(3) | - |
| Cyanide (Total) | 1.7 | <0.50 | <0.50 | 60(3) | - |
| pH | 6.6 | 8.3 | - | - | - |
| Organic Matter (%) | 50 | 0.69 | 4.5 | - | - |
| **Metals and Semi-Metals** | | | | | |
| Boron (Hot Water Soluble) | 0.71 | <0.40 | 1.3 | 240000 | - |
| Arsenic | 120 | 28 | 25 | 640 | - |
| Barium | 960 | 23 | 90 | 22000(2) | - |
| Beryllium | 3.7 | 1.3 | <1.0 | 12 | - |
| Cadmium | 0.20 | 1.2 | 0.89 | 190 | - |
| Chromium | 220 | 8.8 | 7.4 | 8600 | - |
| Copper | 450 | 9.6 | 18 | 68000 | - |
| Mercury | 2.8 | 0.14 | 0.12 | 1100 | - |
| Nickel | 61 | 15 | 9.0 | 980 | - |
| Lead | 3000 | 19 | 47 | 2330(1) | 3000mg/kg WS02A 0.0-0.4m bgl |
| Selenium | <0.20 | <0.20 | <0.20 | 12000 | - |
| Vanadium | 62 | 9.8 | 5.1 | 9000 | - |
| Zinc | 91 | 34 | 29 | 730000 | - |
| Chromium (Hexavalent) | <0.50 | <0.50 | <0.50 | 33 | - |
| **Total Petroleum Hydrocarbons** | | | | | |
| TPH >C6-C10 | - | <1.0 | - | - | - |
| TPH >C10-C21 | - | 30 | - | - | - |
| TPH >C21-C40 | - | 66 | - | - | - |
| Total TPH >C6-C40 | 120 | 95 | - | - | - |

| | | | | | |
|---|---|---|---|---|---|
| **Polynuclear Aromatic Hydrocarbons (PAHs)** | | | | | |
| Naphthalene | 1.4 | <0.10 | - | 190 | - |
| Acenaphthylene | <0.10 | 0.10 | - | 83000 | - |
| Acenaphthene | 0.20 | <0.10 | - | 84000 | - |
| Fluorene | <0.10 | <0.10 | - | 63000 | - |
| Phenanthrene | 1.4 | 0.48 | - | 22000 | - |
| Anthracene | 0.23 | <0.10 | - | 520000 | - |
| Fluoranthene | 1.2 | 0.45 | - | 23000 | - |
| Pyrene | 1.3 | 0.34 | - | 54000 | - |
| Benz(a)anthracene | 0.52 | <0.10 | - | 170 | - |
| Chrysene | 0.52 | <0.10 | - | 350 | - |
| Benzo(b)fluoranthene | 0.66 | <0.10 | - | 44 | - |
| Benzo(k)fluoranthene | 0.16 | <0.10 | - | 1200 | - |
| Benzo(a)pyrene | 0.34 | <0.10 | - | 35 | - |
| Indeno(1,2,3-c,d)pyrene | 0.14 | <0.10 | - | 500 | - |
| Dibenzo(a,h)anthracene | <0.10 | <0.10 | - | 3.5 | - |
| Benzo(g,h,i)perylene | 0.31 | <0.10 | - | 3900 | - |
| Total Polyaromatic Hydrocarbons | 8.4 | <2.0 | - | - | - |

| **Solid Contamination Results – Bulk Made Ground Material** | | | | | |
|---|---|---|---|---|---|
| **Determinand** | **No. of Samples** | **Range of Results** | **Mean** | **GAC** | **Exceeded Allowable** |
| **Inorganics, Carbon and Asbestos** | | | | | |
| Asbestos Quantification | 8 | 1 No. detection | | - | 5.6%<br>WS04<br>0.3-0.8m bgl* |
| Sulphate (2:1 Water Soluble) as SO4 (g/l) | 9 | <0.010 - 0.610 | 0.150 | - | - |
| Nitrate (Water Soluble) (g/l) | 9 | <0.010 | <0.010 | - | - |
| Cyanide (Free) | 9 | <0.50 | <0.50 | 60(3) | - |
| Cyanide (Total) | 9 | <0.50 | <0.50 | 60(3) | - |
| pH | 9 | 7.4 - 8.2 | 7.7 | - | - |
| Organic Matter (%) | 9 | 1.6 - 48 | 22.39 | - | - |
| **Metals and Semi-Metals** | | | | | |
| Boron (Hot Water Soluble) | 9 | <0.40 - 6.3 | 1.41 | 240000 | - |
| Arsenic | 9 | 8.8 - 120 | 41.64 | 640 | - |
| Barium | 9 | 150 - 640 | 343 | 22000(2) | - |
| Beryllium | 9 | <1.0 - 5.6 | 2.24 | 12 | - |
| Cadmium | 9 | <0.10 - 2.6 | 0.64 | 190 | - |
| Chromium | 9 | 22 - 52 | 28.22 | 8600 | - |
| Copper | 9 | 23 - 3300 | 485 | 68000 | - |
| Mercury | 9 | <0.10 - 2.1 | 0.75 | 1100 | - |
| Nickel | 9 | 29 - 72 | 47.22 | 980 | - |
| Lead | 9 | 14 - 1300 | 421 | 2330(1) | - |

| | | | | | |
|---|---|---|---|---|---|
| Selenium | 9 | <0.20 | <0.20 | 12000 | - |
| Vanadium | 9 | 18 - 120 | 56.44 | 9000 | - |
| Zinc | 9 | 50 - 2100 | 458 | 730000 | - |
| Chromium (Hexavalent) | 9 | <0.50 | <0.50 | 33 | - |
| **Total Petroleum Hydrocarbons** | | | | | |
| TPH >C6-C10 | 9 | <0.1 - 25 | 4.89 | - | - |
| TPH >C10-C21 | 9 | <0.1 - 130 | 36.58 | - | - |
| TPH >C21-C40 | 9 | <0.1 - 150 | 60.56 | - | - |
| Total TPH >C6-C40 | 9 | <10 - 300 | 102 | - | - |
| **Polynuclear Aromatic Hydrocarbons (PAHs)** | | | | | |
| Naphthalene | 9 | <0.10 - 8.4 | 1.84 | 190 | - |
| Acenaphthylene | 9 | <0.10 - 0.15 | 0.11 | 83000 | - |
| Acenaphthene | 9 | <0.10 - 1.1 | 0.36 | 84000 | - |
| Fluorene | 9 | <0.10 - 0.70 | 0.29 | 63000 | - |
| Phenanthrene | 9 | <0.10 - 8.3 | 3.49 | 22000 | - |
| Anthracene | 9 | <0.10 - 1.8 | 0.67 | 520000 | - |
| Fluoranthene | 9 | <0.10 - 12 | 4.31 | 23000 | - |
| Pyrene | 9 | <0.10 - 11 | 4.17 | 54000 | - |
| Benz(a)anthracene | 9 | <0.10 - 4.5 | 1.62 | 170 | - |
| Chrysene | 9 | <0.10 - 5.8 | 1.96 | 350 | - |
| Benzo(b)fluoranthene | 9 | <0.10 - 5.5 | 1.80 | 44 | - |
| Benzo(k)fluoranthene | 9 | <0.10 - 1.8 | 0.59 | 1200 | - |
| Benzo(a)pyrene | 9 | <0.10 - 3.8 | 1.32 | 35 | - |
| Indeno(1,2,3-c,d)pyrene | 9 | <0.10 - 2.8 | 0.90 | 500 | - |
| Dibenzo(a,h)anthracene | 9 | <0.10 - 0.32 | 0.15 | 3.5 | - |
| Benzo(g,h,i)perylene | 9 | <0.10 - 2.5 | 0.90 | 3900 | - |
| Total Polyaromatic Hydrocarbons | 9 | <2.00 - 63 | 24.42 | - | - |

***Asbestos determined by gravimetry as lagging comprising amosite and chrysotile at a concentration of 5.6%.***

| **Solid Contamination Results – Natural Glacial Till** | | | | | |
|---|---|---|---|---|---|
| **Determinand** | **No. of Samples** | **Range of Results** | **Mean** | **GAC** | **Exceeded Allowable** |
| **Inorganics, Carbon and Asbestos** | | | | | |
| Sulphate (2:1 Water Soluble) as SO4 (g/l) | 3 | <0.030 - 0.080 | 0.060 | - | - |
| Nitrate (Water Soluble) (g/l) | 3 | <0.010 | <0.010 | - | - |
| Cyanide (Free) | 3 | <0.50 | <0.50 | 60$^{(3)}$ | - |
| Cyanide (Total) | 3 | <0.50 | <0.50 | 60$^{(3)}$ | - |
| pH | 3 | 7.3 - 8.8 | 8.13 | - | - |
| Organic Matter (%) | 3 | 0.45 - 4.5 | 2.05 | - | - |
| **Metals and Semi-Metals** | | | | | |
| Boron (Hot Water Soluble) | 3 | <0.4 - 1.0 | 0.61 | 240000 | - |

| | | | | | |
|---|---|---|---|---|---|
| Arsenic | 3 | 11 - 43 | 24.00 | 640 | - |
| Barium | 3 | 47 - 96 | 72.00 | 22000(2) | - |
| Beryllium | 3 | <1.0 - 1.1 | 1.03 | 12 | - |
| Cadmium | 3 | <0.10 - 0.62 | 0.40 | 190 | - |
| Chromium | 3 | 6.4 - 34 | 17.80 | 8600 | - |
| Copper | 3 | 8.0 - 28 | 14.83 | 68000 | - |
| Mercury | 3 | <0.10 | <0.10 | 1100 | - |
| Nickel | 3 | 7.2 - 29 | 16.73 | 980 | - |
| Lead | 3 | 5.9 - 25 | 17.63 | 2330(1) | - |
| Selenium | 3 | <0.20 | <0.20 | 12000 | - |
| Vanadium | 3 | <5.0 - 36 | 18.67 | 9000 | - |
| Zinc | 3 | 14 - 53 | 28.00 | 730000 | - |
| Chromium (Hexavalent) | 3 | <0.50 | <0.50 | 33 | - |
| **Total Petroleum Hydrocarbons** | | | | | |
| Total TPH >C6-C40 | 3 | <10 | <10 | - | - |
| **Polynuclear Aromatic Hydrocarbons (PAHs)** | | | | | |
| Naphthalene | 3 | <0.10 | <0.10 | 190 | - |
| Acenaphthylene | 3 | <0.10 | <0.10 | 83000 | - |
| Acenaphthene | 3 | <0.10 | <0.10 | 84000 | - |
| Fluorene | 3 | <0.10 | <0.10 | 63000 | - |
| Phenanthrene | 3 | <0.10 - 0.28 | 0.16 | 22000 | - |
| Anthracene | 3 | <0.10 | <0.10 | 520000 | - |
| Fluoranthene | 3 | <0.10 - 0.40 | 0.20 | 23000 | - |
| Pyrene | 3 | <0.10 - 0.29 | 0.16 | 54000 | - |
| Benz(a)anthracene | 3 | <0.10 | <0.10 | 170 | - |
| Chrysene | 3 | <0.10 | <0.10 | 350 | - |
| Benzo(b)fluoranthene | 3 | <0.10 | <0.10 | 44 | - |
| Benzo(k)fluoranthene | 3 | <0.10 | <0.10 | 1200 | - |
| Benzo(a)pyrene | 3 | <0.10 | <0.10 | 35 | - |
| Indeno(1,2,3-c,d)pyrene | 3 | <0.10 | <0.10 | 500 | - |
| Dibenzo(a,h)anthracene | 3 | <0.10 | <0.10 | 3.5 | - |
| Benzo(g,h,i)perylene | 3 | <0.10 | <0.10 | 3900 | - |
| Total Polyaromatic Hydrocarbons | 3 | <2.0 | <2.0 | - | - |

*Generic Assessment Criteria Used: LQM/CIEH S4ULs for Human Health Risk Assessment (3rd edition, 2015), unless stated:*

1) *Category 4 Screening Levels (March 2014).*
2) *CL:AIRE Soil GAC for Human Health Assessment (January 2010).*
3) *In-house GAC of 60mg/kg has been used as no GAC methodology currently exists.*

**Note 1** – Units are in mg/kg unless stated.
**Note 2** – Assumed 1% SOM
**Note 3** – Detection limit values used to calculate arithmetic mean
**Note 4** – All exceedances noted relate to the commercial land use scenario

Soil sample analyses have assessed the presence of contaminants at selected window sample locations, and the concentrations at which they occur on a spatial basis.

No concentrations of determinands in any made ground or natural deposits were found to exceed human health GACs for the commercial land use scenario with the exception of a single exceedance of lead within sub-base material and a single detection of asbestos within bulk made ground material.

The lead exceedance and elevated concentrations of organic matter were recorded in WS02A between 0.0m and 0.4m bgl and relates to suspected sub-base material. These values were not regarded to be representative of the material, given the physical inspection i.e. limestone gravel and comparison with other on site results from the same material type. Consequently, the sample was re-tested for a full metal / semi metals suite and organic material which recorded concentrations more in line with the expected results and thus confirming the anomalous nature of the initial test. As a result, the sub-base strata is not regarded to pose a significant contaminative potential.

As stated within Section 6.1, olfactory evidence of contamination in the form of gravel sized fibrous material was recorded within made ground material between 0.3m and 1.2m bgl in WS04. Asbestos quantification of the bulk sample confirmed that the suspected material contained 5.6% by gravimetry of amosite and chrysotile in the form of lagging.

## Groundwater Samples

| Determinand | WS02A 2.00m bgl | BH06 6.33m bgl | WS203 7.98m bgl | Tier 1 Screening Value (Groundwater) | Tier 1 Screening Value (Surface water) |
|---|---|---|---|---|---|
| **Bulk Parameters** | | | | | |
| pH | 7.4 | 8.2 | 7.5 | - | - |
| Electrical Conductivity (µS/cm) | 1100 | 1200 | 1400 | 1880 | - |
| Chemical Oxygen Demand (mg $O_2$/l) | <10 | 19 | 18 | - | - |
| Redox Potential (mV) | 66 | 130 | 130 | - | - |
| Hardness (mg/l) | 600 | 610 | 820 | - | - |
| DOC (mg/l) | 8.3 | - | - | - | - |
| **Dissolved Metals / Semi-Metals** | | | | | |
| Arsenic (Dissolved) | 4.9 | 6.8 | 1.5 | 7.5 | 50 |
| Barium (Dissolved) | 51 | 200 | 160 | - | - |
| Beryllium (Dissolved) | <1.0 | <1.0 | <1.0 | - | - |
| Cadmium (Dissolved) | <0.080 | <0.080 | <0.080 | 3.75 | 1.5 |
| Cobalt (Dissolved) | 2.4 | 1.9 | <1.0 | - | - |
| Chromium (Dissolved) | 1.5 | <1.0 | 1.7 | 37.5 | 3.4 |
| Copper (Dissolved) | <1.0 | 1.1 | 1.4 | 1500 | 1.0 |
| Mercury (Dissolved) | <0.50 | <0.50 | <0.50 | 0.75 | 0.07 |
| Nickel (Dissolved) | 4.6 | 4.7 | 8.8 | 15 | 34 |
| Lead (Dissolved) | <1.0 | <1.0 | <1.0 | 7.5 | 14 |
| Selenium (Dissolved) | 4.9 | 1.6 | <1.0 | 7.5 | - |
| Vanadium (Dissolved) | <1.0 | <1.0 | <1.0 | - | - |
| Zinc (Dissolved) | **64** | **24** | 9.8 | - | 10.9* |
| **Total Petroleum Hydrocarbons Screen** | | | | | |
| Total TPH >C6-C40 | <10 | <10 | <10 | 90(1) | 90(1) |
| **Polynuclear Aromatic Hydrocarbons (PAHs)** | | | | | |
| All PAHs were found to be below their respective detection limits. | | | | | |

**Tier 1 Screening Value for Zinc is for bioavailable dissolved zinc plus Ambient Background Concentration.*
*Tier 1 Assessment Criteria Used: The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015, unless stated:*

1) *CL:AIRE Petroleum Hydrocarbons in Groundwater (2017).*

**Note 1** – Units are in µg/l unless stated.
**Note 2** – Cadmium Screening Value based upon a water hardness of Class 5.
**Note 3** – Significant elevations are shown in **bold**.

All determinands have been recorded below their respective Tier 1 screening values with the exception of zinc of which 2 No. exceedances were recorded in both the shallow and deep groundwater samples.

Utilising the Water Framework Directive – Unite Kingdom Technical Advisory Group (WFD-UKTAG) bioavailability assessment tool the bioavailable fraction of these zinc (surface waters only) was undertaken and the bioavailable fraction was calculated at 0.32 of the total dissolved fraction which results in:

- WS02A from 64ug/l to 20.2ug/l (bioavailable fraction)
- BH06 from 24ug/l to 7.5ug/l (bioavailable fraction)

On this basis, the WS02A remains an exceedance about the EQS of 10.9ug/l

Recovery of these 3 No. groundwater samples was performed utilising a single bailer with purging containing until in-situ parameters were recorded as steady - the results of which are contained in Appendix 5. The samples were not fixed or filtered due to concerns with the adsorbed fraction associated with the TDS results changing phase into the dissolved fraction leading to unrepresentative results. However, this method is not perfect as interactions between the dissolved and adsorbed phase will be present.

## 6.5 Ground Gas

Following the findings of the Phase 1 Geo-Environmental Investigation, ground gas and groundwater monitoring wells were located in specific positions in order to allow monitoring and subsequent ground gas risk assessment to be undertaken. The response zones for each of the monitoring wells are detailed in Section 5.0.

5 No. gas monitoring visits were recorded and are summarised as follows:

| Gas Monitoring Well | Steady $O_2$ Concentration Range (%) | Peak $CO_2$ Concentration Range (%) | Peak $CH_4$ Concentration Range (%) | Peak $H_2S$ Concentration Range (ppm) | Atmospheric Pressure Range (mbar) | Steady Gas Flow Range (l/hr) |
|---|---|---|---|---|---|---|
| WS02A | 14.4 - 19.8 | 0.6 - 7.8 | 0.0 | 0.0 | 987 - 1025 | 0.0 |
| WS05 | 17.6 - 19.4 | 1.7 - 3.6 | 0.0 | 0.0 | 987 - 1025 | 0.0 |
| WS07 | 19.1 - 19.8 | 0.6 - 0.8 | 0.0 | 0.0 | 987 - 1025 | 0.0 |
| WS08 | 17.1 - 18.7 | 1.2 - 2.2 | 0.0 | 0.0 | 987 - 1025 | 0.0 |

*Ground gas monitoring was undertaken utilising a GFM 4300 gas analyser.*

These results and ground gas monitoring instrument calibration certificate are included in Appendix 5.

## 6.6 Groundwater Depth Monitoring

Site Investigation

During the construction of the exploratory holes, no groundwater ingress was recorded. However, damp / wet conditions were recorded in the following locations:

| Monitoring Well | Strata | Depth Range | Description |
|---|---|---|---|
| WS02A | Granular Made Ground | 1.40m to 1.65m bgl | Damp |
| WS02A | Granular Made Ground | 1.65m to 1.85m bgl | Wet |
| WS02A | Cohesive Made Ground | 2.00m to 2.70m bgl | Wet |
| WS03 | Granular Made Ground | 1.50m to 1.60m bgl | Damp |
| WS03 | Cohesive Made Ground | 1.65m to 2.50m bgl | Damp |

These descriptions are included in the window sample logs contained in Appendix 3.

Following construction, as discussed in Section 6.5, standpipes were installed in 4 No. of the window sample holes for the purposes of ground gas and groundwater monitoring. These were installed with 1.00m sections of plain pipe, underlain by 2.00m of slotted pipe to termination, to allow targeted monitoring of hydrogeological conditions in the underlying natural deposits.

Initial Groundwater Depth Monitoring Results

In addition to the 4 No. wells installed as part of the site investigation works, a further well from the Atkins 2006 investigation (WS203) and a well from the Integra 2013 investigation (BH06) were monitored to allow assessment of potential deeper groundwater. 5 No. depth monitoring visits have been undertaken, recording water depths as follows:

| Monitoring Well | Response Zone (m bgl) | Water Level (m bgl) | | |
|---|---|---|---|---|
| | | Minimum | Average | Maximum |
| WS02A | 1.0m to 3.0m | 1.62m | 1.69m | 1.72m |
| WS05 | 1.0m to 3.0m | Dry | Dry | Dry |
| WS07 | 1.0m to 3.0m | Dry | Dry | Dry |
| WS08 | 1.0m to 3.0m | Dry | Dry | Dry |
| WS203 | 3.0m to 8.5m | 6.55m | 6.67m | 6.74m |
| BH06 | 2.0m to 9.5m | 1.55m | 1.74m | 2.17m |

On the basis that groundwater was located in both WS203 and BH06 which extend to bedrock, a continuous groundwater regime is considered to be present on site between approximately 8m and 9m bgl and is considered to represent the known underlying confined Secondary A Aquifer. However, the recorded groundwater may also be representative of the underlying superficial Secondary (Undifferentiated) Aquifer.

Of the 4 No. monitoring wells constructed with response zones through made ground deposits, a single well (WS02A) recorded groundwater. Consequently, perched water lenses / bands are anticipated within permeable / granular made ground deposits.

These initial results are included in Appendix 5.

# 7.0 REVISED CONCEPTUAL MODELS

The original conceptual models produced in the Phase 1 Geo-Environmental Investigation report have been revised using the findings from the Phase 2 Environmental Ground Investigation.

## 7.1 Revised Conceptual Model for Human Health Risk Assessment

Following the findings of the intrusive investigation including the chemical testing, the following evidence has been recorded of potential contaminative sources;

| Contaminant | Pathway | Receptor | Likelihood of Occurrence | Risk |
|---|---|---|---|---|
| Asbestos | Inhalation of contaminated dust (indoor and outdoor) | End-user | **Highly unlikely:** Anticipated hardstanding cover of the proposed development will remove any pathways. | **LOW RISK** |
| | | Construction workers<br>General public | **Likely:** Construction works may release airborne fibres. Construction workers are recommended to use appropriate PPE, and dust prevention measures are recommended, which will also reduce the risk to the general public. | **MODERATE - HIGH RISK** |

Although only a single positive asbestos identification was recorded on site, the risk of further potential unrecorded asbestos materials beneath the site cannot be discounted. Based on this and the proposed demolition works, the risk to the construction / ground / demolition workers is regarded as a moderate to high given the potential for significant dust generation (exposure) and unknown direct / indirect exposure e.g. during trench excavations.

Consequently, an asbestos specialist should be contracted to specify the required health and safety requirements including PPE, dust suppression requirements, tool box talks, method statement and risk assessments to reduce the risk to acceptable levels.

In terms of the end-user, given the anticipated hardstanding nature of the site the risk of exposure is negligible and so the risk is low. However, where areas of soft landscaping are present a minimum 300mm clean cover system should be utilised to as a precautionary measure incorporating a geotextile marker and 300mm of chemically tested materials. These remedial measures will require validation in line with Manchester City Council guidance.

If trees are to be planted as part of the proposed development, phytotoxicity must be considered for the purposes of biodiversity and aesthetic issues. It is considered prudent to avoid contaminated made ground for the rooting zone and it may be preferable to import clean topsoil for planting purposes.

It is recommended that once asbestos testing is undertaken following demolition of the on-site buildings and the proposed development profile is broadly defined – this includes any stockpiled materials to ensure the above remedial measures are suitable.

Where on site materials are to be removed from site, then further chemical testing including asbestos identification of these specific materials is recommended given the potential for conservative classification to be determined.

The conceptual site model is illustrated in Appendix 6.

## 7.2 Revised Conceptual Model for Ground Gas Risk Assessment

Made ground deposits associated with historic on and off-site developments including potential localised off-site organic materials / river deposits were identified in the Phase 1 Geo-environmental report as potential ground gas sources. However, no significant potential ground gas sources were identified during the Phase 2 intrusive environmental investigation. The made ground and natural strata are considered to have a low and very low ground gas generation potential, respectively.

On the basis of the 5 No. monitoring visits undertaken, the gas regime across the site is regarded to represent Characteristic Situation 1 (CS1) as detailed in BS:8485 (2015) guidance. Elevated levels of $CO_2$ were recorded in WS02A (<7.8%) which are anticipated to be attributed to localised slightly organic rich deposits on site with negligible ground gas flow rates (<0.1l/hr) – identifying the source as a low flux gas generation source. The elevated concentrations were only recorded in this one position with carbon dioxide concentrations as low as 0.6% recorded in surrounding monitoring wells and consequently this is not deemed a significant source.

On this basis, the site is considered to pose a low risk to human health and the building structure and fabric of the proposed development.

Radon

Following a review of BRE 211 and HPA / BGS radon reports, no radon protective measures are considered necessary at the post development site.

### 7.3 Revised Conceptual Model for Controlled Waters Risk Assessment

The controlled waters receptors relevant to the site include;

a) Secondary A Aquifer within the underlying Halesowen Formation;
b) Corn Brook – a partially culverted brick lined heavily modified Secondary River located downgradient, approximately 130m to the north of the site.
c) Secondary (Undifferentiated) Aquifer within granular bands / layers contained within the underlying natural superficial glacial till.

It should be noted that as part of the Integra Phase 1 investigation (2015), the glacial till deposits were designated as unproductive strata as stipulated by Landmark, the environmental database company. As part of due diligence work for this report, the strata has been re-designated as a Secondary (Undifferentiated) Aquifer in accordance with current Environment Agency classifications.

Despite the significant alterations and modifications to Corn Brook including partial culverting, concrete and brick lined walls it is regarded as the primary waters receptor for the site.

The solid and groundwater testing recorded no significant evidence of contamination, albeit marginal zinc exceedances above stringent EQS allowable concentrations relating to the protection of bioaccumulation within aquatic species. Given the marginal exceedance, the dilution and diffusion effect from the site to the Corn Brook and the highly-modified nature of the river this exceedance it is not regarded as significant. Consequently, on this basis the risk to the controlled waters from the site are considered low.

However, during the demolition works including the removal of the existing hardstanding materials e.g. concrete slab – measures in line with Environment Agency guidance should be utilised to minimise potential acute contaminative events.

In conclusion, the risks posed to surface water and groundwater receptors via vertical and lateral migration are considered to be low. The conceptual site model is illustrated in Appendix 6.

## 8.0 RECOMMENDATIONS

8.1 The solid chemical test results indicate a potential asbestos exposure risk and it is recommended that appropriate health and safety measures utilised as recommended by an asbestos specialist and any areas soft landscaped are overlain by a minimum 300mm cover system to negate exposure to final end-users. This should be re-determined by onsite post demolition verification testing to ensure this remedial measure is suitable.

8.2 The solid and groundwater chemical test results indicate that the site poses a low risk to controlled waters receptors due to the lack of significant mobile contaminative sources and low sensitivity receptors.

8.3 Ground gas monitoring works across the site indicate a gas regime of CS1 in accordance with BS:8485 (2015). On this basis, the site is considered to pose a low risk to human health and the building structure and fabric of the proposed development.

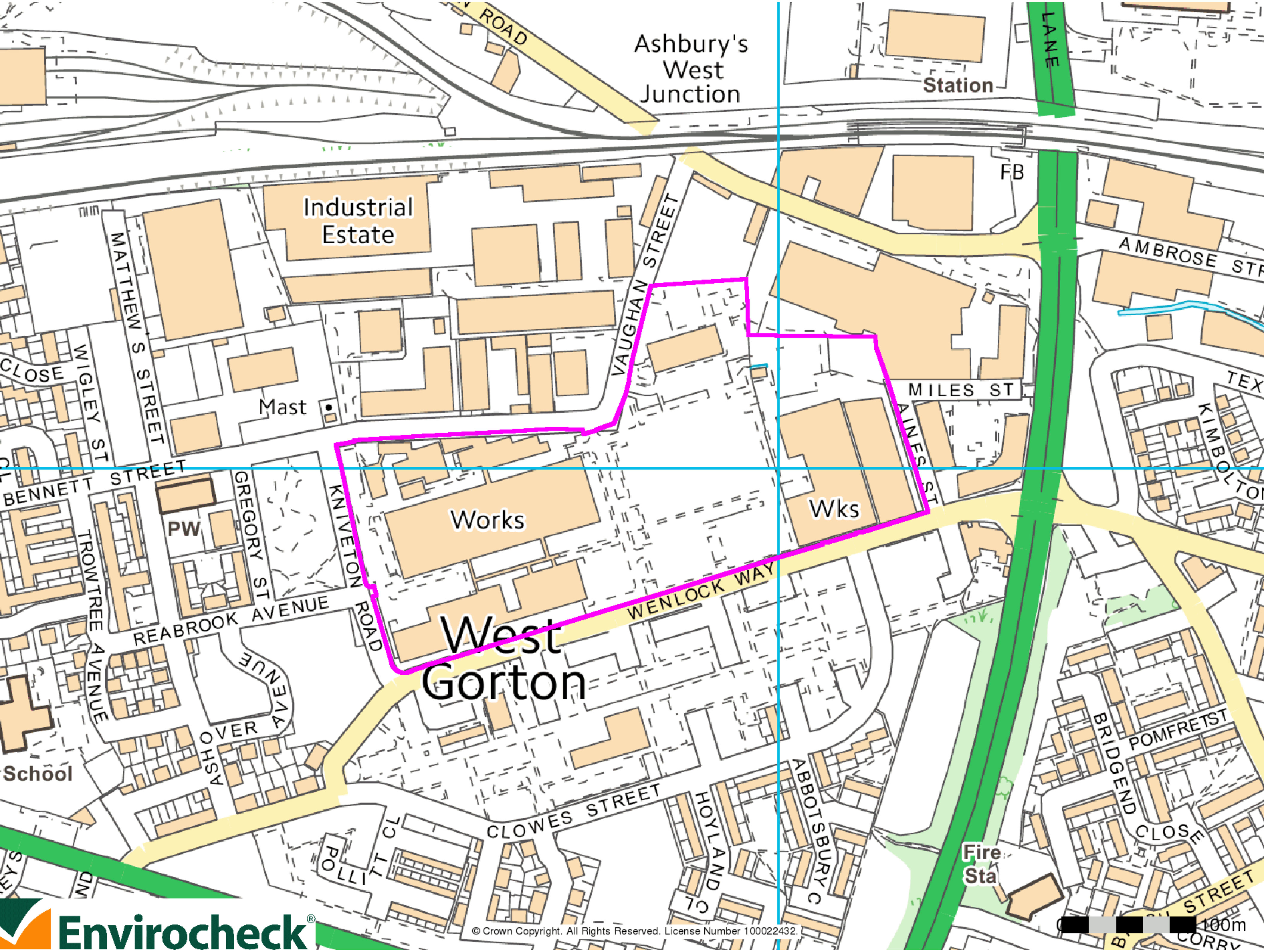
8.4 Appropriate assessment of subsurface ground services e.g. water main pipeline specifications should be undertaken utilising the associated regulator documentation. It should be noted that the requirement for further chemical testing to meet these requirements may be required.

8.5 If materials are to be removed from site, they should be assessed by an appropriately accredited person / landfill.

8.6 It should be noted that, if any further visual or olfactory evidence of contamination is encountered during remediation or construction work, the Local Authority Environmental Health Officer and Environment Agency should be contacted immediately in order to agree any necessary remediation measures.

# APPENDIX 1

# SITE LOCATION PLANS AND AERIAL PHOTOGRAPH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LANE
FB
Industrial Estate
VAUGHAN STREET
AMBROSE STR
MATTHEWS STREET
WIGLEY ST
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Mast
MILES ST
TEX
KIMBOLTON
AINES ST
CL
BENNETT STREET
PW
GREGORY ST
KNIVETON ROAD
Works
Wks
WENLOCK WAY
TROWTREE AVENUE
REABROOK AVENUE
AVENUE
West Gorton
ASHOVER
School
POMFRET ST
BRIDGEND CLOSE
ABBOTSBURY C
HOYLAND CL
CLOWES STREET
POLLITT CL
Fire Sta
STREET
CORRY
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100m

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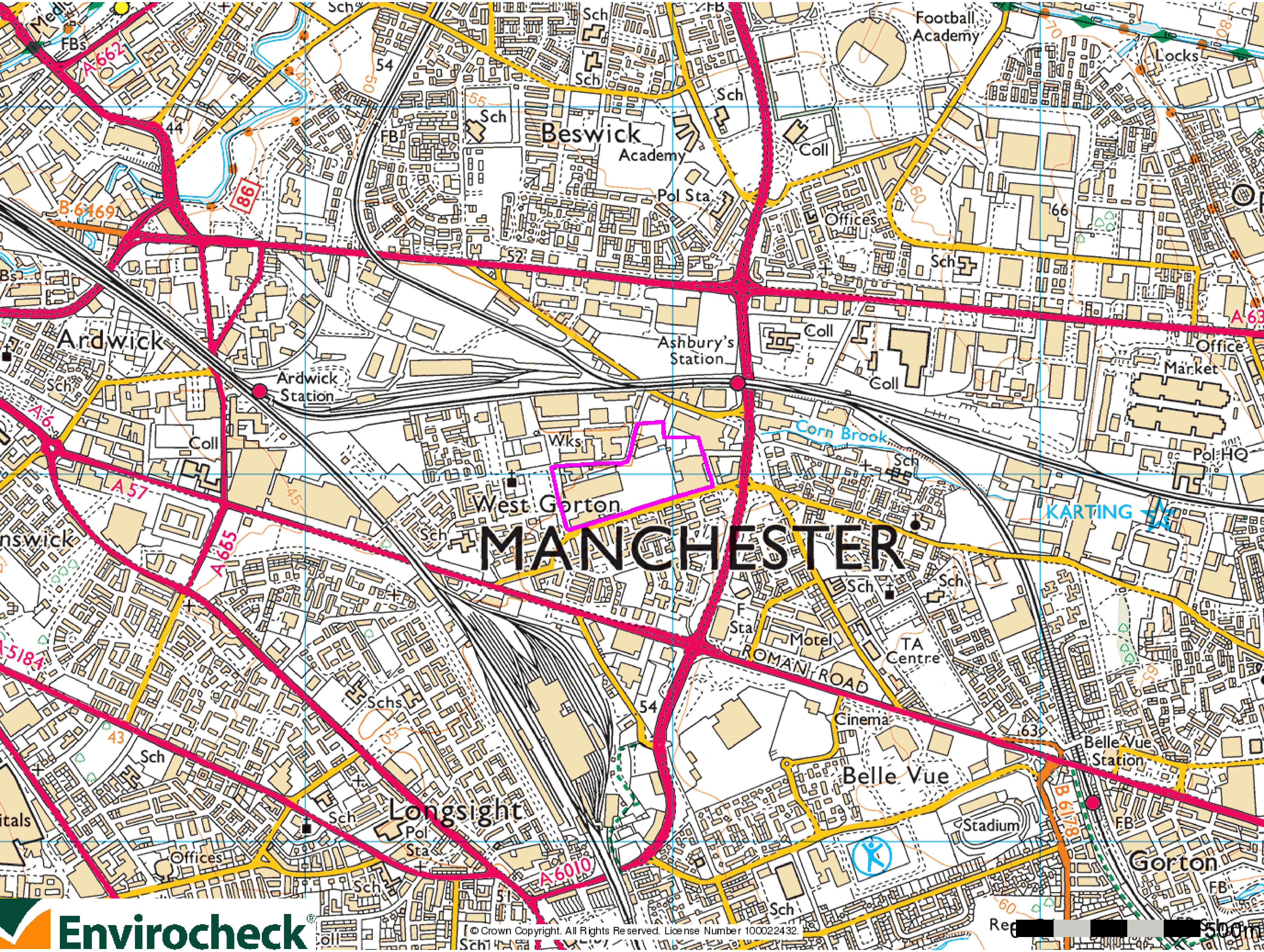
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Academy
Pol Sta
Football Academy
Locks
Sch
Coll
FB
FBs
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B 6469
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55
52
Offices
66
A 635
Ardwick
Ardwick Station
Ashbury's Station
Coll
Office
Market
Corn Brook
Pol HQ
Wks
West Gorton
MANCHESTER
KARTING
A 6
A 57
A 665
Coll
Sch
F Sta
Motel
TA Centre
ROMAN ROAD
Cinema
Belle Vue
Belle Vue Station
Stadium
B 6178
Gorton
A 5184
Schs
Longsight
Pol Sta
Offices
A 6010
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51
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43
45
50
60
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80
500m

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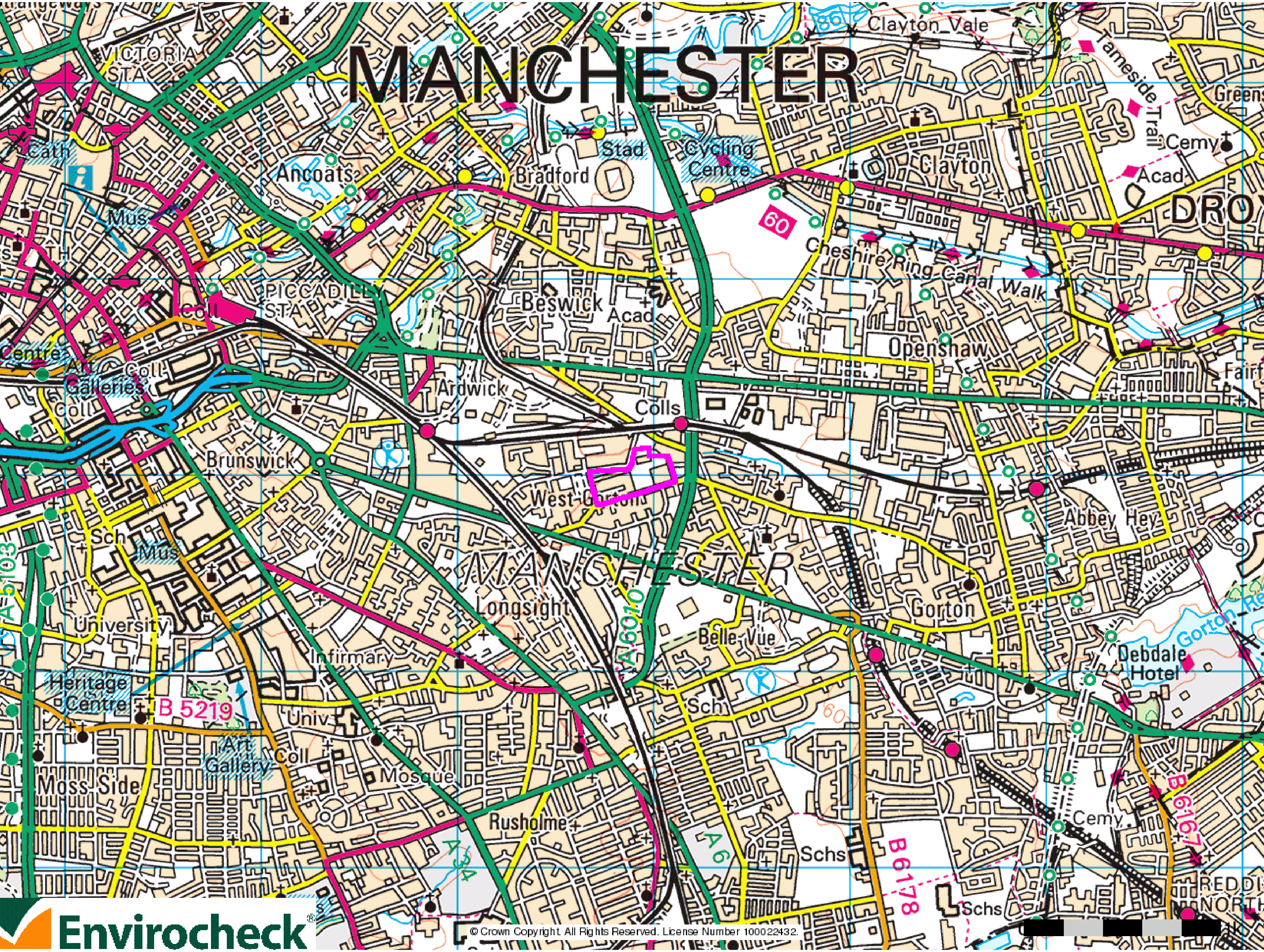
MANCHESTER
VICTORIA STA
Cath
Mus
Ancoats
Bradford
Stad
Cycling Centre
Clayton Vale
Clayton
Tameside Trail
Greens
Cemy
Acad
DROY
60
Cheshire Ring Canal Walk
PICCADILLY STA
Coll
Beswick
Acad
Openshaw
Centre
Art Galleries
Coll
Ardwick
Colls
Fairf
Brunswick
West Gorton
Abbey Hey
Sch
Mus
MANCHESTER
Longsight
A 6010
Gorton
A 5103
University
Infirmary
Belle Vue
Debdale Hotel
Gorton Re
Heritage Centre
B 5219
Univ
Sch
Art Gallery
Coll
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Moss Side
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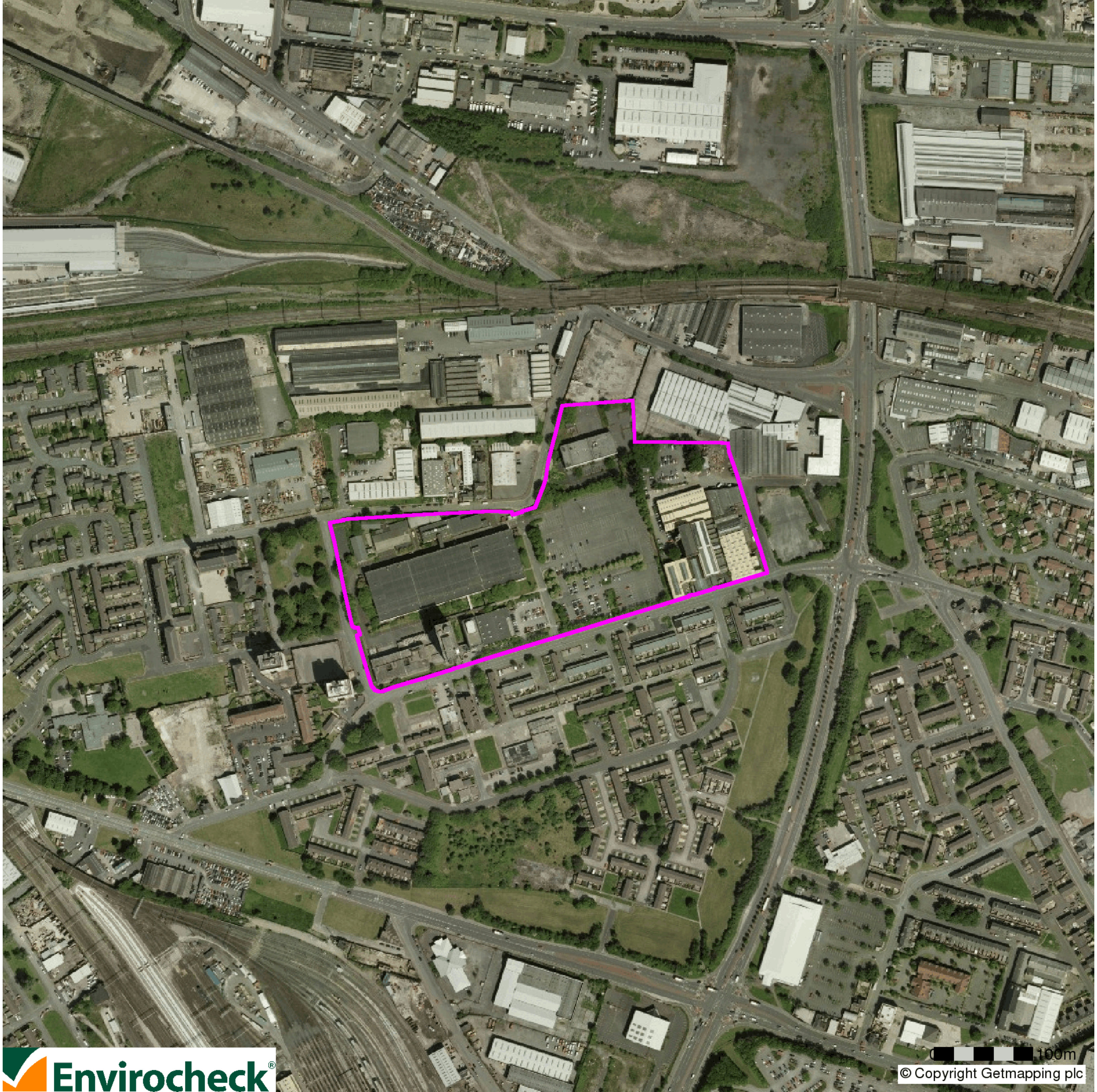

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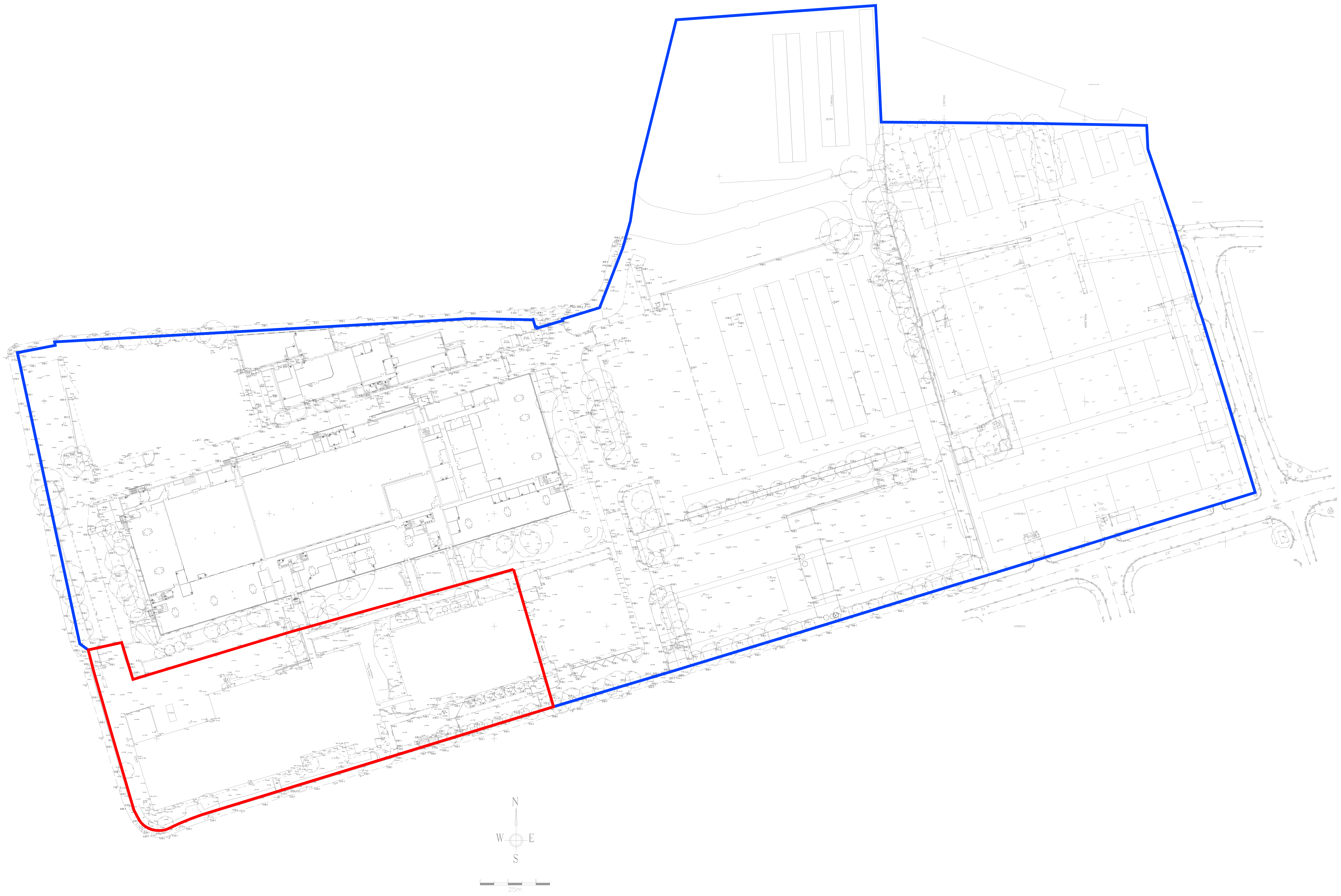


## Notes.

1 All dimensions and levels are in metres unless noted otherwise.

2 This drawing is to be read in conjunction with all relevant Architects and Service Engineers drawings.

## Key

| | |
|---|---|
| 🟥 | Approximate Wenlock Tower Complex Site Boundary |
| 🟦 | Approximate Wider Space Project Boundary |

| Rev | Drawn | Date | Description |
|---|---|---|---|
| | | | |

**Drawing Status**
INFORMATION

**Contract**
WENLOCK TOWER
COMPLEX,
SPACE PROJECT,
WEST GORTON

**Drawing Title**
SITE LOCATION PLAN

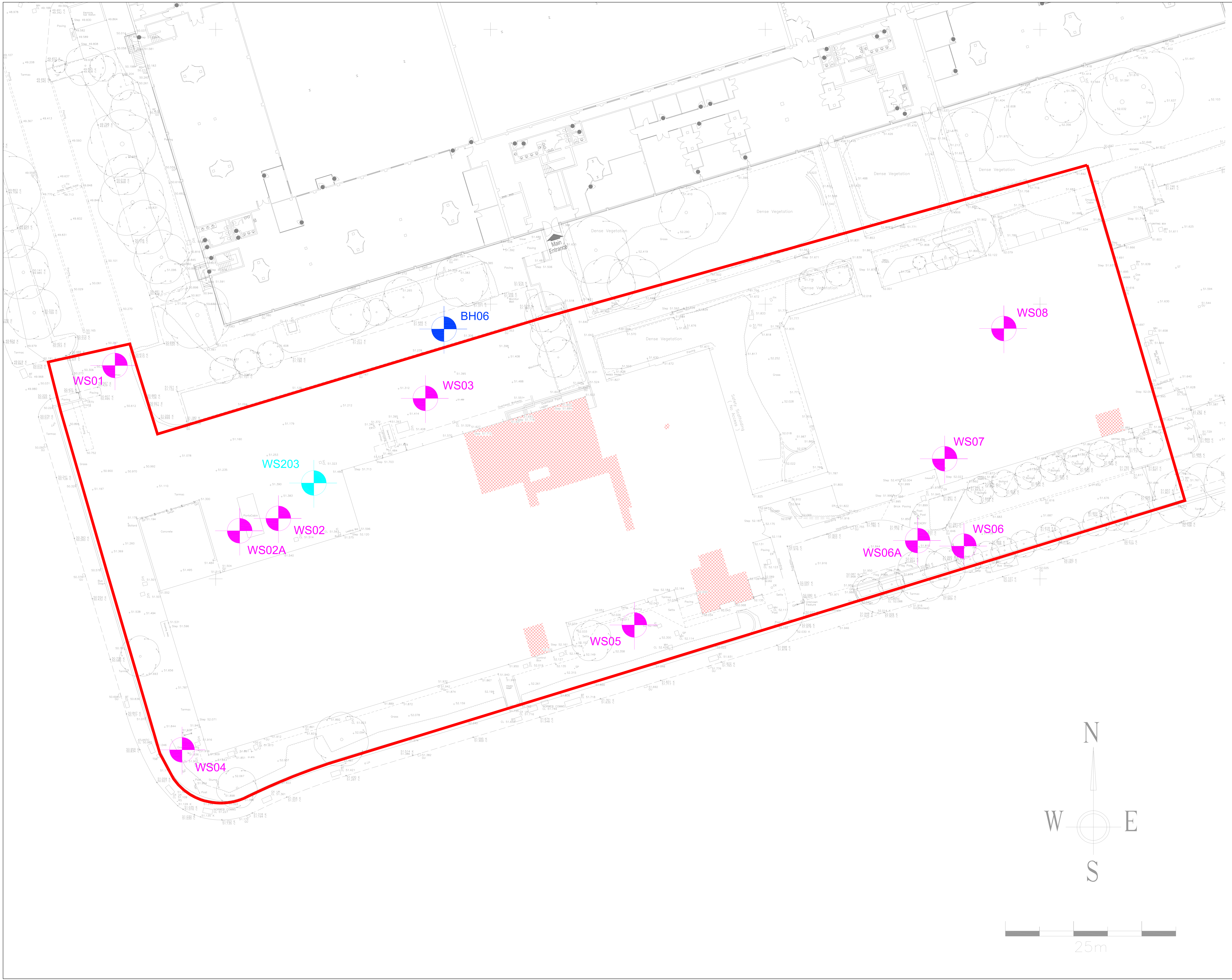
**Integra**
**consulting**
**environmental**

**Suite 4, 14-32 Hewitt Street, Manchester, M15 4GB**
**email: environmental@integraconsulting.co.uk**
**web: www.integraconsulting.co.uk**
**tel: 0161 237 9310**

| | | | |
|---|---|---|---|
| **Scales** 1:750@A1 | **Date** MAY 2017 | | |
| **Drawn** JG | **Checked** AE | | |
| **Contract No** 2913 | **Drawing No** SI–08 | P1 | |

# APPENDIX 2

# EXPLORATORY HOLE LOCATION PLAN


WS01
WS02
WS02A
WS03
WS04
WS05
WS06
WS06A
WS07
WS08
BH06
WS203
Main Entrance
Dense Vegetation
N
W
E
S
25m

## Notes.

1 All dimensions and levels are in metres unless noted otherwise.

2 This drawing is to be read in conjunction with all relevant Architects and Service Engineers drawings.

## Key

| | |
|---|---|
| ━ | Approximate Site Boundary |
| ⊕ WS01 | Integra Window Sample Location (2017) |
| ⊕ BH06 | Integra Borehole Location (2013) |
| ⊕ WS203 | Atkins Window Sample Location (2006) |
| ▨ | Area Inacessible Due to Presence of ACMs as agreed with AEC |

| Rev | Drawn | Date | Description |
|---|---|---|---|
| | | | |

**Drawing Status**
INFORMATION

**Contract**
WENLOCK TOWER
COMPLEX,
SPACE PROJECT,
WEST GORTON

**Drawing Title**
EXPLORATORY HOLE
LOCATION PLAN

**Integra**
**consulting**
**environmental**

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**tel: 0161 237 9310**

| | |
|---|---|
| **Scales** 1:250@A1 | **Date** APR 2017 |
| **Drawn** JG | **Checked** AE |
| **Contract No** 2913 | **Drawing No** SI–06 P1 |

# APPENDIX 3

# WINDOW SAMPLE LOGS AND PHOTOGRAPHS

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# Window Sample Log

ver. 0.3

Window Sample No.

**WS01**

Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Wenlock Tower Complex | Co-ords: | 386706E - 396912N | Project No. | 2913A |
| Location: | West Gorton, Manchester | Level (m AOD): | 50.40 | Logged By | MB |
| | | Date: | 12/04/2017 | | |
| Client: | Manchester City Council | Weather: | Wet and overcast | Checked By | JG |

| Well / Backfill | Water Strikes | Sample and In Situ Testing Depth(m) | Type | Results | Depth (m) | Level (m AOD) | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | 0.10 | 50.30 | TARMACADAM.<br>MADE GROUND |
| | | | | | 0.30 | 50.10 | Yellowish grey, subangular to subrounded, fine to coarse GRAVEL of limestone.<br>SUB-BASE |
| | | | | | 0.85 | 49.55 | Brown, mottled black, gravelly SAND. Gravel is subangular of fine to medium red brick (20%), suspected slag (20%) and mixed lithologies (60%).<br>MADE GROUND<br>*Becoming clayey from 0.70m bgl.* |
| | | 0.90<br>1.00 | SPT(C) | HVP=40<br>N=11<br>(1,3/2,3,3,3) | 1.20 | 49.20 | Soft, grey, mottled orangish yellow, slightly gravelly, slightly silty CLAY. Gravel is subangular to subrounded of fine to medium mixed lithologies.<br>GLACIAL TILL |
| | | 1.90<br>1.95<br>2.00 | <br><br>SPT(C) | HVP=120<br>HVP=120<br>N=50 (3,3/50 for 275mm) | 2.00 | 48.40 | Very stiff, brown, mottled grey, slightly gravelly, slightly sandy, silty CLAY. Gravel is subangular to subrounded of fine to coarse sandstone.<br>GLACIAL TILL |
| | | | | | | | Window Sample terminated at 2.00m. |

Remarks:

Window sample terminated at 2.00m bgl due to very stiff clay.

Casing Details

| Depth Top (m) | Depth Base (m) | Diameter (mm) |
|---|---|---|
| GL | 1.00 | 101 |

Sample Sleeve Runs

| Depth Top (m) | Depth Base (m) | Diameter (mm) |
|---|---|---|
| 0.00 | 1.00 | 87 |
| 1.00 | 2.00 | 87 |

Water Strike

| Depth Strike (m) | Remarks |
|---|---|
| | Dry |

# Window Sample Photos

**WS01**

Wenlock Tower Complex

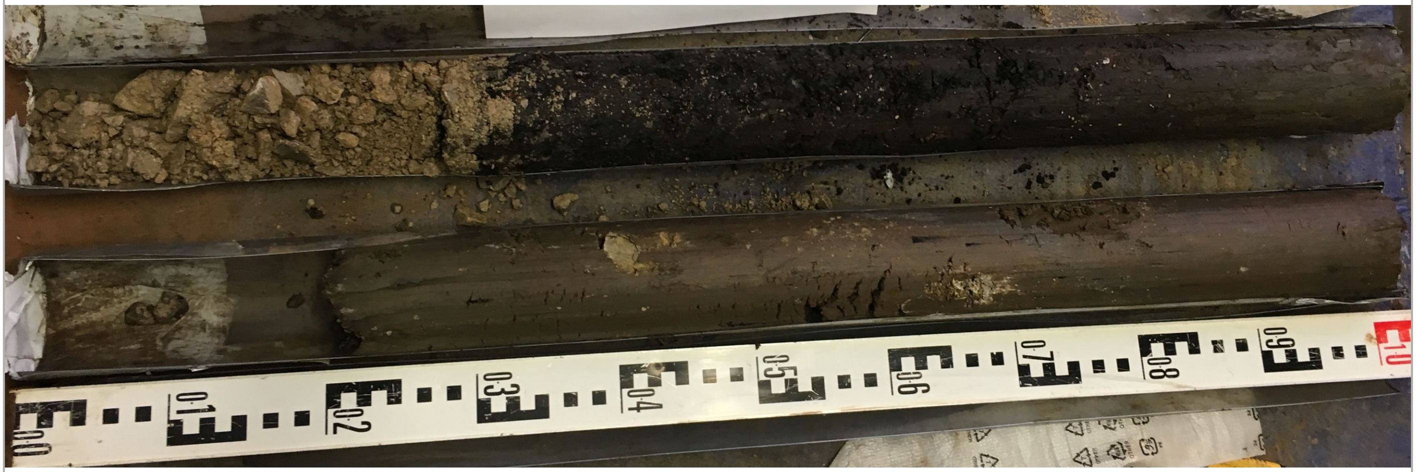
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

**Image 1.** WS01:
*Viewed left to right, top to bottom: 0.00m - 1.00m bgl, 1.00m - 2.00m bgl.*

integra consulting
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web: www.integraconsulting.co.uk
tel: 0161 237 9310

# Window Sample Log

ver. 0.3

Window Sample No.

**WS02**

Sheet 1 of 1

| | | | |
|---|---|---|---|
| Project Name: | Wenlock Tower Complex | Co-ords: | 386727E - 396888N |
| | | Level (m AOD): | 51.45 |
| Location: | West Gorton, Manchester | Date: | 12/04/2017 |
| Client: | Manchester City Council | Weather: | Wet and overcast |

Project No. 2913A

Logged By MB

Checked By JG

| Well / Backfill | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m AOD) | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | Depth(m) | Type | Results | | | |
| | | | | | 0.10 | 51.35 | TARMACADAM.<br>MADE GROUND |
| | | | | | 0.40 | 51.05 | Yellowish grey, subangular to subrounded, fine to coarse GRAVEL of limestone.<br>SUB-BASE |
| | | | | | 0.50 | 50.95 | Firm, brown, mottled black, gravelly, sandy CLAY. Gravel is subangular to well rounded of medium to coarse mixed lithologies.<br>MADE GROUND |
| | | 1.00 | SPT(C) | N=6<br>(2,5/2,2,1,1) | 1.90 | 49.55 | Red, mottled black SAND and GRAVEL with occasional half bricks. Gravel is angular to subangular of fine to coarse red brick (40%), suspected slag (30%) and mixed lithologies (30%).<br>MADE GROUND |
| | | 2.00 | SPT(C) | N=3<br>(1,0/0,1,1,1) | 2.50 | 48.95 | Soft, grey, slightly gravelly, slightly sandy CLAY. Gravel is subangular of fine mixed lithologies. |
| | | | | | 3.00 | 48.45 | Firm, friable, slightly gravelly, slightly sandy, silty CLAY. Gravel is subangular to well rounded of fine to coarse mixed lithologies.<br>GLACIAL TILL |

Window Sample terminated at 3.00m.

1
2
3
4
5
6
7
8
9
10

Remarks:

Window sample terminated at 3.00m bgl due to very stiff clay.

Casing Details

| Depth Top (m) | Depth Base (m) | Diameter (mm) |
|---|---|---|
| GL | 1.00 | 101 |

Water Strike

| Depth Strike (m) | Remarks |
|---|---|
| | Dry |

Sample Sleeve Runs

| Depth Top (m) | Depth Base (m) | Diameter (mm) |
|---|---|---|
| 0.00 | 1.00 | 87 |
| 1.00 | 2.00 | 87 |
| 2.00 | 3.00 | 77 |

# Window Sample Photos

**WS02**

Wenlock Tower Complex

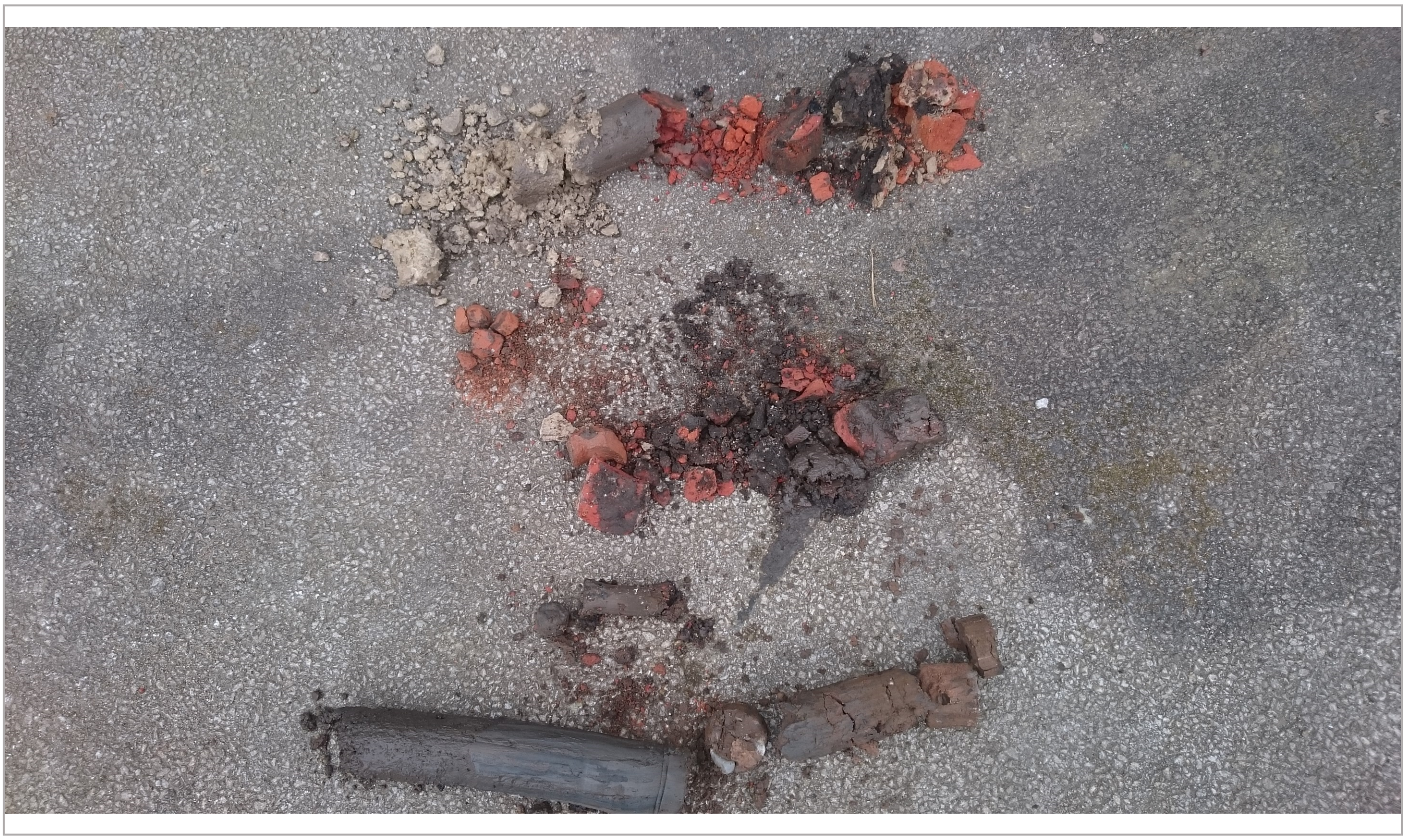

**Image 1.** WS02:
*Viewed left to right, top to bottom: 0.00m - 1.00m bgl, 1.00m - 2.00m bgl, 2.00m - 3.00m bgl.*

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# Window Sample Log

ver. 0.3

Window Sample No.

**WS02A**

Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Wenlock Tower Complex | Co-ords: | 386723E - 396887N | Project No. | 2913A |
| Location: | West Gorton, Manchester | Level (m AOD): | 51.45 | Logged By | MB |
| | | Date: | 12/04/2017 | | |
| Client: | Manchester City Council | Weather: | Wet and overcast | Checked By | JG |

| Well / Backfill | Water Strikes | Sample and In Situ Testing Depth(m) | Type | Results | Depth (m) | Level (m AOD) | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | 0.10 | 51.35 | TARMACADAM.<br>MADE GROUND |
| | | | | | 0.40 | 51.05 | Yellowish grey, subangular to subrounded, fine to coarse GRAVEL of limestone.<br>SUB-BASE |
| | | | | | 0.65 | 50.80 | Firm, brown, mottled black, gravelly, sandy CLAY. Gravel is subangular to well rounded of medium to coarse mixed lithologies.<br>MADE GROUND |
| | | 1.00 | SPT(C) | N=1 (1,0/1,0,0,0) | 1.85 | 49.60 | Dark brown, mottled black SAND and GRAVEL. Gravel is angular to subrounded of fine to medium suspected slag (20%), plastics (5%) and mixed lithologies (75%).<br>MADE GROUND<br>*Angular cobble of red brick and slate at 0.70m bgl.*<br>*Becoming damp from 1.40m bgl.*<br>*Becoming wet and clayey from 1.65m bgl.* |
| | | | | | 1.90 | 49.55 | Soft, orangish yellow, slightly gravelly, slightly sandy CLAY. Gravel is subangular of fine mixed lithologies.<br>MADE GROUND |
| | | 2.00 | SPT(C) | N=50 (25 for 135mm/50 for 295mm) | 2.00 | 49.45 | Soft, grey, mottled black, slightly gravelly CLAY. Gravel is subangular of fine mixed lithologies.<br>MADE GROUND |
| | | 2.60 | | HVP=7 | 2.70 | 48.75 | Very soft, wet, grey, slightly sandy, gravelly CLAY with rare plant remains. Gravel is angular to subrounded of fine to coarse red brick (20%), mudstone (20%), plastics (5%) and mixed lithologies (55%).<br>MADE GROUND |
| | | | | | 3.00 | 48.45 | Firm, friable, brown, slightly gravelly, slightly sandy, silty CLAY. Gravel is subangular to well rounded of fine to coarse mixed lithologies.<br>GLACIAL TILL |

Window Sample terminated at 3.00m.

Remarks:

Window sample terminated at 3.00m bgl due to very stiff clay.

| Casing Details | | |
|---|---|---|
| Depth Top (m) | Depth Base (m) | Diameter (mm) |
| GL | 1.00 | 101 |

| Water Strike | |
|---|---|
| Depth Strike (m) | Remarks |
| | Dry |

| Sample Sleeve Runs | | |
|---|---|---|
| Depth Top (m) | Depth Base (m) | Diameter (mm) |
| 0.00 | 1.00 | 87 |
| 1.00 | 2.00 | 87 |
| 2.00 | 3.00 | 77 |

# Window Sample Photos

## WS02A

Wenlock Tower Complex

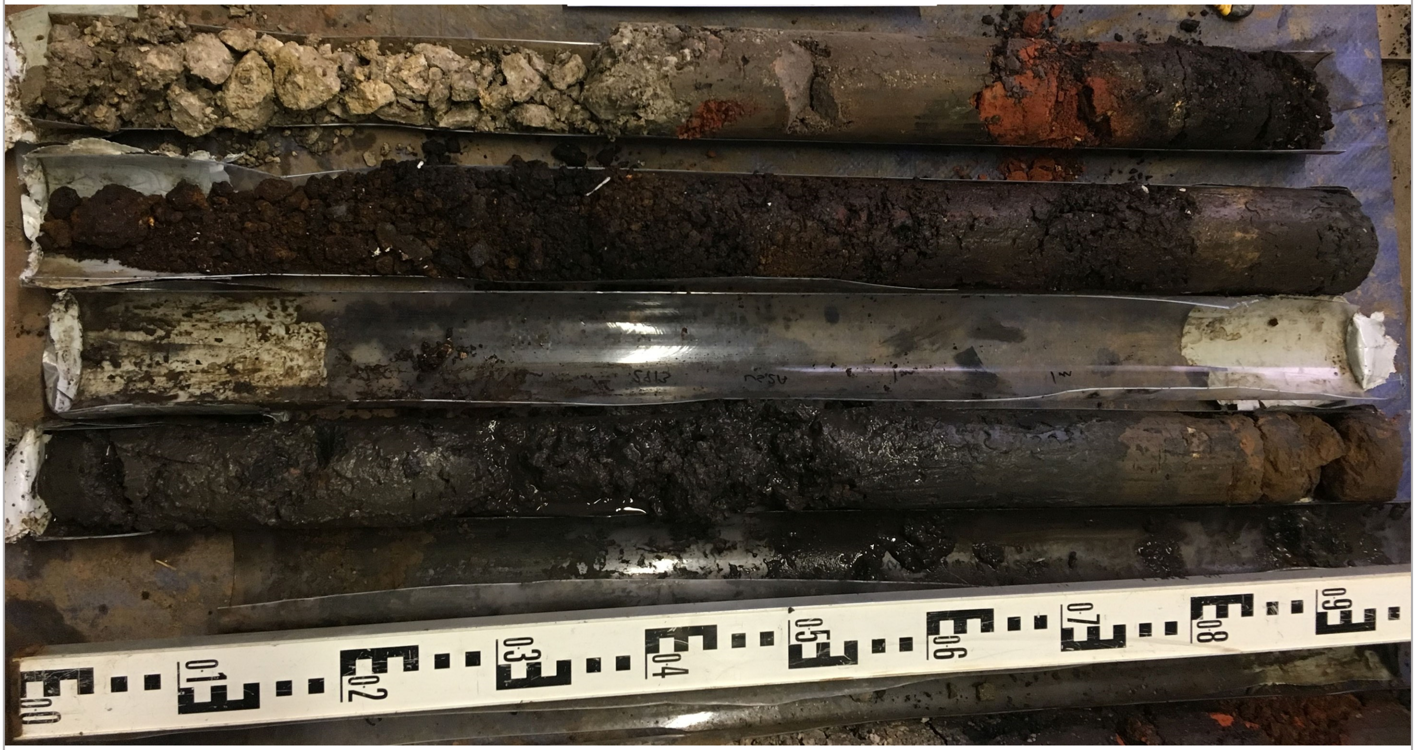
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9

**Image 1.** WS02A:
*Viewed left to right, top to bottom: 0.00m - 1.00m bgl, 1.00m - 2.00m bgl, 2.00m - 3.00m bgl.*

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web: www.integraconsulting.co.uk
tel: 0161 237 9310

# Window Sample Log

ver. 0.3

| | |
|---|---|
| Window Sample No. | **WS03** |
| Sheet 1 of 1 | |
| Project Name: | Wenlock Tower Complex |
| Location: | West Gorton, Manchester |
| Client: | Manchester City Council |
| Co-ords: | 386748E - 396906N |
| Level (m AOD): | 51.40 |
| Date: | 12/04/2017 |
| Weather: | Wet and overcast |
| Project No. | 2913A |
| Logged By | MB |
| Checked By | JG |

| Sample Depth(m) | Type | Results | Depth (m) | Level (m AOD) | Stratum Description |
|---|---|---|---|---|---|
| | | | 0.10 | 51.30 | TARMACADAM.<br>MADE GROUND |
| | | | 0.55 | 50.85 | Yellowish grey, subangular to subrounded, fine to coarse GRAVEL of limestone.<br>SUB-BASE |
| 1.00 | SPT(C) | N=4 (1,0/1,2,1,0) | 0.95 | 50.45 | Black, mottled yellow, very gravelly, slightly clayey SAND. Gravel is subangular to subrounded of fine to coarse red brick (30%), sandstone (10%), glass (5%) and mixed lithologies (55%).<br>MADE GROUND |
| 1.40 | | HVP=14 | 1.50 | 49.90 | Soft, yellowish brown, mottled grey, slightly sandy, gravelly CLAY. Gravel is subangular to subrounded of fine to coarse red brick (10%) and mixed lithologies (90%).<br>MADE GROUND |
| | | | 1.60 | 49.80 | Damp, brown SAND and GRAVEL. Gravel is subangular to subrounded of fine to medium suspected slag (10%) and mixed lithologies (90%).<br>MADE GROUND |
| | | | 1.65 | 49.75 | Soft, orangish yellow, slightly gravelly, slightly sandy CLAY. Gravel is subangular of fine mixed lithologies.<br>MADE GROUND |
| 1.95<br>2.00<br>2.45 | <br>SPT(C)<br> | HVP=20<br>N=16 (0,0/0,3,6,7)<br>HVP=10 | 2.50 | 48.90 | Very soft, damp, grey, mottled black, slightly sandy, gravelly CLAY. Gravel is angular to subangular of fine to medium mudstone (20%), red brick (10%) and mixed lithologies (70%).<br>MADE GROUND<br>*Becoming slightly gravelly from 1.85m bgl.* |
| 3.00 | SPT(C) | N=50 (25 for 105mm/50 for 235mm) | 3.00 | 48.40 | Stiff, brown, slightly gravelly, slightly sandy, silty CLAY. Gravel is subrounded of fine to coarse sandstone.<br>GLACIAL TILL<br>*Becoming very stiff from 2.70m bgl.* |
| | | | | | Window Sample terminated at 3.00m. |

Remarks:

A representative shear vane reading was not possible from 2.50m bgl due to the stiffness and high granular secondary content of the clay.

Window sample terminated at 3.00m bgl due to very stiff clay.

| Casing Details | | |
|---|---|---|
| Depth Top (m) | Depth Base (m) | Diameter (mm) |
| GL | 1.00 | 101 |

| Water Strike | |
|---|---|
| Depth Strike (m) | Remarks |
| | Dry |

| Sample Sleeve Runs | | |
|---|---|---|
| Depth Top (m) | Depth Base (m) | Diameter (mm) |
| 0.00 | 1.00 | 87 |
| 1.00 | 2.00 | 87 |
| 2.00 | 3.00 | 77 |

# Window Sample Photos

**WS03**

Wenlock Tower Complex

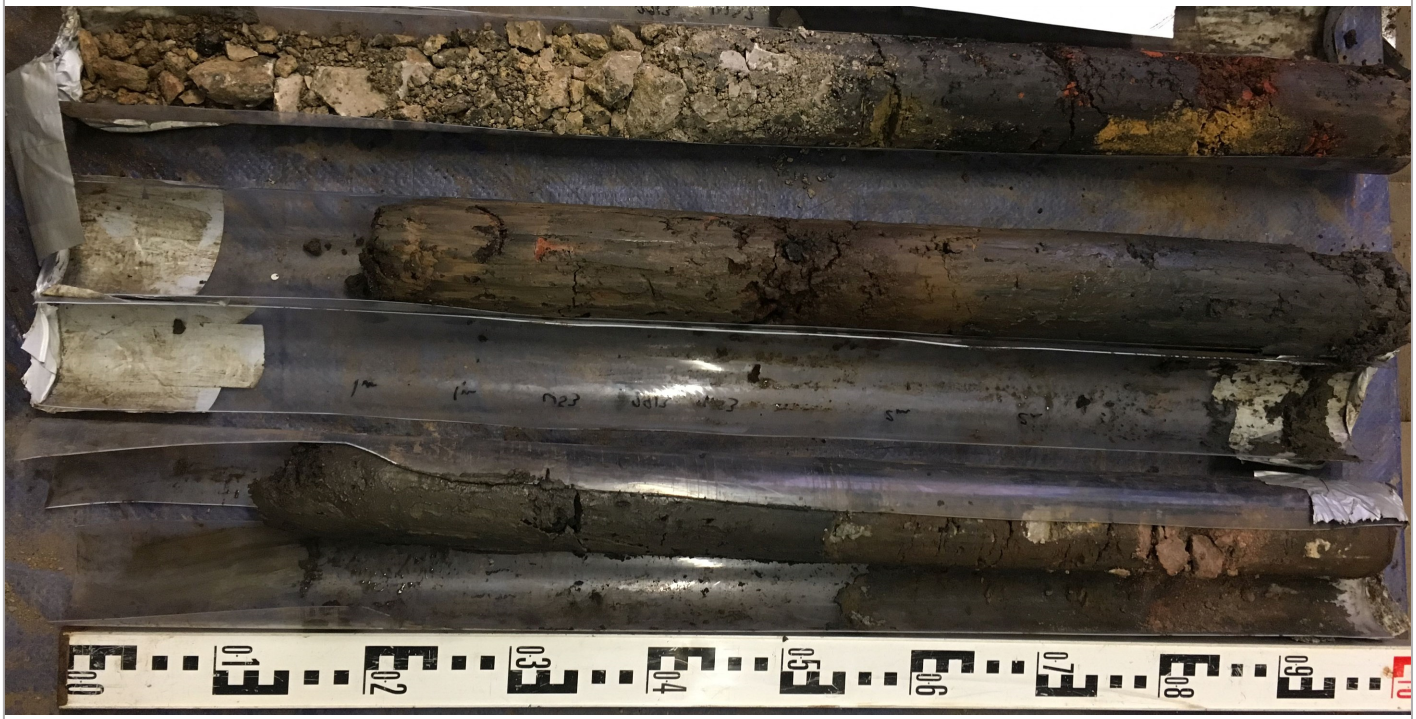

**Image 1.** WS03:
*Viewed left to right, top to bottom: 0.00m - 1.00m bgl, 1.00m - 2.00m bgl, 2.00m - 3.00m bgl.*

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# Window Sample Log

ver. 0.3

Window Sample No.
**WS04**
Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Wenlock Tower Complex | Co-ords: | 386715E - 396855N | Project No. | 2913A |
| Location: | West Gorton, Manchester | Level (m AOD): | 51.95 | Logged By | MB |
| | | Date: | 12/04/2017 | | |
| Client: | Manchester City Council | Weather: | Wet and overcast | Checked By | JG |

Sample and In Situ Testing

| Depth(m) | Type | Results |
|---|---|---|
| 0.60 | | HVP=20 |
| 1.00 | SPT(C) | N=9 (2,2/3,2,2,2) |
| 1.85 | | HVP=36 |
| 2.00 | SPT(C) | N=5 (0,0/1,2,1,1) |
| 2.85 | | HVP=5 |
| 3.00 | SPT(C) | 50 (10,13/50 for 220mm) |

| Depth (m) | Level (m AOD) | Stratum Description |
|---|---|---|
| 0.10 | 51.85 | Grassed, dark brown, silty, clayey SAND with frequent rootlets.<br>TOPSOIL |
| 0.30 | 51.65 | Dark brownish black, gravelly, slightly clayey SAND with occasional rootlets. Gravel is angular to subrounded of fine to coarse suspended slag (50%), red brick (10%) and mixed lithologies (40%).<br>MADE GROUND |
| | | Firm, brown, mottled orange and black, slightly sandy, gravelly CLAY. Gravel is subangular to subrounded of fine to coarse fibrous material (30%), red brick (10%), mudstone (10%) and mixed lithologies (50%).<br>MADE GROUND |
| 1.20 | 50.75 | Black, mottled orange, gravelly, clayey SAND. Gravel is angular to subrounded of fine to coarse suspected slag (10%), red brick (5%) and mixed lithologies (85%).<br>MADE GROUND |
| 1.40 | 50.55 | Firm, grey, mottled yellow and black, slightly gravelly, silty CLAY. Gravel is subrounded of fine mixed lithologies.<br>GLACIAL TILL<br>*Becoming soft from 2.00m bgl.* |
| 2.35 | 49.60 | Soft, orangish brown, slightly gravelly, slightly sandy, clayey SILT. Gravel is rounded of fine mixed lithologies.<br>GLACIAL TILL |
| 2.90 | 49.05 | Stiff, brown, mottled grey, slightly gravelly, slightly sandy, silty CLAY. Gravel is rounded of medium to coarse sandstone (50%) and mixed lithologies (50%).<br>GLACIAL TILL |
| 3.00 | 48.95 | Window Sample terminated at 3.00m. |

Remarks:

Window sample terminated at 3.00m bgl due to very stiff clay.

Casing Details

| Depth Top (m) | Depth Base (m) | Diameter (mm) |
|---|---|---|
| GL | 1.00 | 101 |

Water Strike

| Depth Strike (m) | Remarks |
|---|---|
| | Dry |

Sample Sleeve Runs

| Depth Top (m) | Depth Base (m) | Diameter (mm) |
|---|---|---|
| 0.00 | 1.00 | 87 |
| 1.00 | 2.00 | 87 |
| 2.00 | 3.00 | 77 |

# Window Sample Photos

## WS04

Wenlock Tower Complex

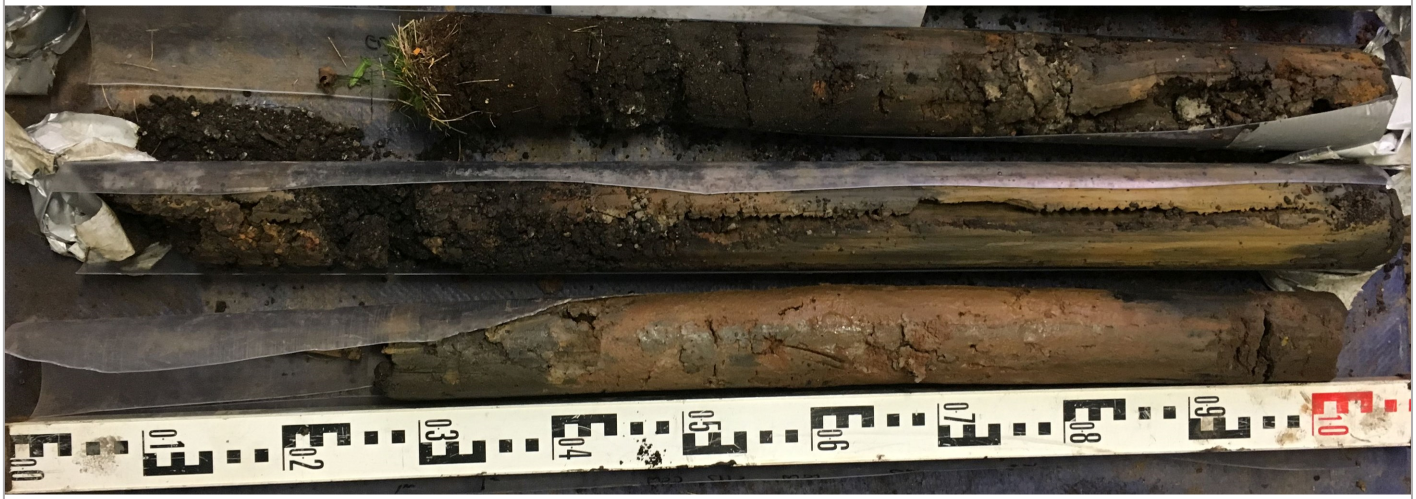
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

**Image 1.** WS04:
*Viewed left to right, top to bottom: 0.00m - 1.00m bgl, 1.00m - 2.00m bgl, 2.00m - 3.00m bgl.*

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# Window Sample Log

ver. 0.3

Window Sample No.

**WS05**

Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Wenlock Tower Complex | Co-ords: | 386781E - 396873N | Project No. | 2913A |
| Location: | West Gorton, Manchester | Level (m AOD): | 52.10 | Logged By | MB |
| | | Date: | 12/04/2017 | | |
| Client: | Manchester City Council | Weather: | Wet and overcast | Checked By | JG |

| Well / Backfill | Water Strikes | Sample and In Situ Testing Depth(m) | Type | Results | Depth (m) | Level (m AOD) | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | 0.10 | 52.00 | Grassed, dark brown, silty, clayey SAND with frequent rootlets.<br>TOPSOIL |
| | | | | | 0.40 | 51.70 | Black SAND and GRAVEL. Gravel is angular to subrounded of fine to medium suspected slag (50%) and mixed lithologies (50%).<br>MADE GROUND |
| | | | | | 0.60 | 51.50 | Stiff, dark grey, mottled black and brown, gravelly, very sandy CLAY. Gravel is subangular to subrounded of fine to coarse red brick (20%), suspected slag (10%) and mixed lithologies (70%).<br>MADE GROUND |
| | | 0.70 | | HVP=60 | | | |
| | | 1.00 | SPT(C) | N=9 (1,2/3,2,2,2) | | | Stiff, grey, gravelly, sandy CLAY. Gravel is subangular to subrounded of fine to coarse mixed lithologies.<br>GLACIAL TILL<br>*Becoming soft from 1.00m bgl.* |
| | | 1.30 | | HVP=40 | 1.30 | 50.80 | Firm, yellow, silty CLAY.<br>GLACIAL TILL |
| | | 1.50 | | HVP=52 | | | |
| | | | | | 1.55 | 50.55 | Stiff, brown, mottled grey, slightly gravelly, silty CLAY. Gravel is subrounded of fine of medium sandstone and coal.<br>GLACIAL TILL |
| | | 1.75 | | HVP=103 | | | |
| | | 2.00 | SPT(C) | N=27 (2,2/4,6,7,10) | | | |
| | | 2.50 | | HVP=50 | | | |
| | | | | | | | *Well rounded cobble of igneous rock at 2.70m bgl.* |
| | | 3.00 | SPT(C) | N=50 (10,14/50 for 230mm) | 3.00 | 49.10 | Window Sample terminated at 3.00m. |

Remarks:

A representative shear vane reading was not possible from 2.60m bgl due to the stiffness and high granular secondary content of the clay.

Window sample terminated at 3.00m bgl due to very stiff clay.

Casing Details

| Depth Top (m) | Depth Base (m) | Diameter (mm) |
|---|---|---|
| GL | 1.00 | 101 |

Water Strike

| Depth Strike (m) | Remarks |
|---|---|
| | Dry |

Sample Sleeve Runs

| Depth Top (m) | Depth Base (m) | Diameter (mm) |
|---|---|---|
| 0.00 | 1.00 | 87 |
| 1.00 | 2.00 | 87 |
| 2.00 | 3.00 | 77 |

| # Window Sample Photos | **WS05** |
|---|---|
| | Wenlock Tower Complex |

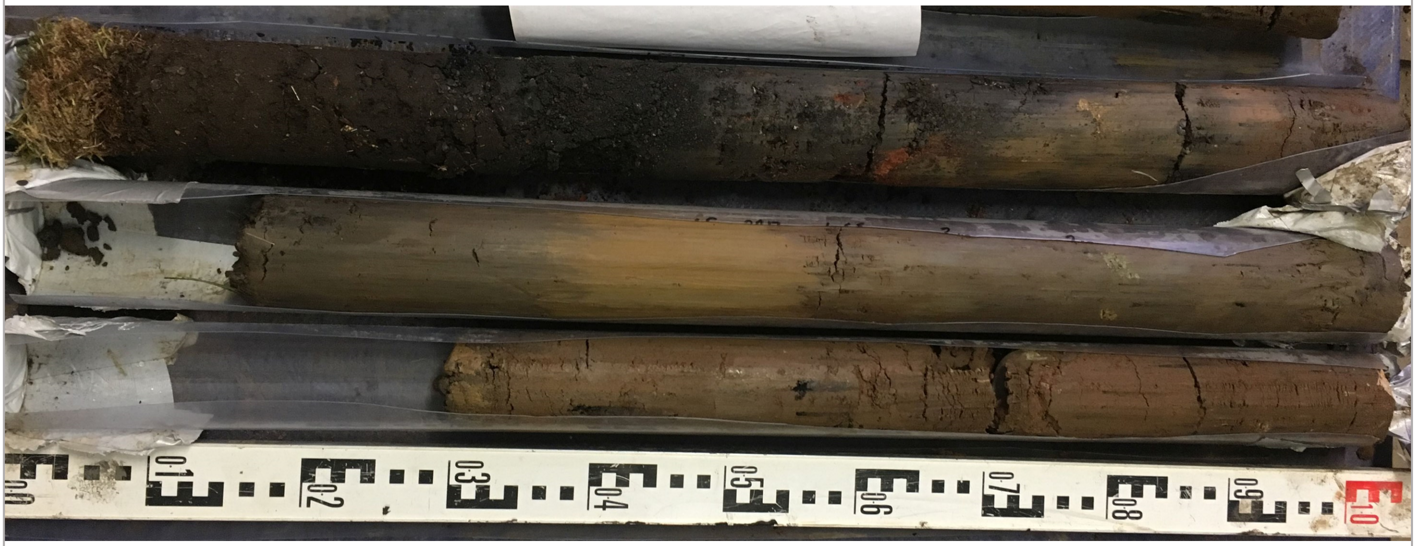

**Image 1.** WS05:
*Viewed left to right, top to bottom: 0.00m - 1.00m bgl, 1.00m - 2.00m bgl, 2.00m - 3.00m bgl.*

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# Window Sample Log

ver. 0.3

Window Sample No.

**WS06**

Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Wenlock Tower Complex | Co-ords: | 386829E - 396886N | Project No. | 2913A |
| Location: | West Gorton, Manchester | Level (m AOD): | 51.80 | Logged By | MB |
| | | Date: | 12/04/2017 | | |
| Client: | Manchester City Council | Weather: | Wet and overcast | Checked By | JG |

| Well / Backfill | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m AOD) | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | Depth(m) | Type | Results | | | |
| | | | | | 0.10 | 51.70 | TARMACADAM.<br>MADE GROUND |
| | | | | | 0.40 | 51.40 | Yellowish grey, subangular to subrounded, fine to coarse GRAVEL of limestone.<br>SUB-BASE |
| | | | | | | | Window Sample terminated at 0.40m. |

Remarks:

Window sample terminated at 0.40m bgl on concrete obstruction.

| Casing Details | | | Sample Sleeve Runs | | |
|---|---|---|---|---|---|
| Depth Top (m) | Depth Base (m) | Diameter (mm) | Depth Top (m) | Depth Base (m) | Diameter (mm) |
| GL | 0.40 | 101 | 0.00 | 0.40 | 87 |

| Water Strike | |
|---|---|
| Depth Strike (m) | Remarks |
| | Dry |

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tel: 0161 237 9310

# Window Sample Log

ver. 0.3

Window Sample No.

## WS06A

Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Wenlock Tower Complex | Co-ords: | 386824E - 396886N | Project No. | 2913A |
| Location: | West Gorton, Manchester | Level (m AOD): | 51.80 | Logged By | MB |
| | | Date: | 12/04/2017 | | |
| Client: | Manchester City Council | Weather: | Wet and overcast | Checked By | JG |

| Well / Backfill | Water Strikes | Sample and In Situ Testing | | | Depth (m) | Level (m AOD) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | | Depth(m) | Type | Results | | | | |
| ▨ | | | | | 0.10 | 51.70 | ▨ | TARMACADAM.<br>MADE GROUND |
| ▨ | | | | | 0.40 | 51.40 | ▨ | Yellowish grey, subangular to subrounded, fine to coarse GRAVEL of limestone.<br>SUB-BASE |
| | | | | | | | | Window Sample terminated at 0.40m. |

1
2
3
4
5
6
7
8
9
10

Remarks:

Window sample terminated at 0.40m bgl on concrete obstruction.

| Casing Details | | | Sample Sleeve Runs | | |
|---|---|---|---|---|---|
| Depth Top (m) | Depth Base (m) | Diameter (mm) | Depth Top (m) | Depth Base (m) | Diameter (mm) |
| GL | 0.40 | 101 | 0.00 | 0.40 | 87 |

| Water Strike | |
|---|---|
| Depth Strike (m) | Remarks |
| | Dry |

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tel: 0161 237 9310

# Window Sample Log

ver. 0.3

Window Sample No.
**WS07**
Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| Project Name: | Wenlock Tower Complex | Co-ords: | 386827E - 396897N | Project No.<br>2913A |
| Location: | West Gorton, Manchester | Level (m AOD): | 52.00 | Logged By<br>MB |
| | | Date: | 13/04/2017 | |
| Client: | Manchester City Council | Weather: | Wet and overcast | Checked By<br>JG |

| Well / Backfill | Water Strikes | Sample and In Situ Testing Depth(m) | Type | Results | Depth (m) | Level (m AOD) | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | 0.23 | 51.77 | CONCRETE.<br>MADE GROUND |
| | | 1.00 | SPT(C) | N=13<br>(1,2/2,3,4,4) | 1.00 | 51.00 | Light brownish grey, mottled orange, slightly sandy, slightly clayey, angular to subrounded, fine to coarse GRAVEL of limestone (95%) and mixed lithologies (5%).<br>SUB-BASE |
| | | 1.30 | | HVP=80 | 1.15 | 50.85 | Firm, brown, slightly gravelly, slightly sandy, silty CLAY. Gravel is angular to subangular of fine to coarse sandstone (50%) and mixed lithologies (50%).<br>MADE GROUND |
| | | 1.50<br>1.85 | | HVP=90<br>HVP=77 | 1.95 | 50.05 | Soft to firm, brown, slightly gravelly, silty CLAY. Gravel is subangular of fine coal and mixed lithologies.<br>GLACIAL TILL<br>*Becoming very stiff from 1.40m bgl.*<br>*Rounded cobble of mudstone at 1.70m bgl.* |
| | | 2.00 | SPT(C) | N=37<br>(5,5/7,7,8,15) | 2.40 | 49.60 | Brown, mottled grey, slightly gravelly, clayey SAND. Gravel is subrounded of fine to medium mudstone, sandstone and coal.<br>GLACIAL TILL |
| | | 3.00 | SPT(C) | 50 (25 for 105mm/50 for 105mm) | 3.00 | 49.00 | Very stiff, very friable, brown, very sandy CLAY.<br>GLACIAL TILL |

Window Sample terminated at 3.00m.

1 2 3 4 5 6 7 8 9 10

Remarks:

A representative shear vane reading was not possible from 2.40m bgl due to the stiffness and high granular secondary content of the clay.

Window sample terminated at 3.00m bgl due to very stiff clay.

Casing Details

| Depth Top (m) | Depth Base (m) | Diameter (mm) |
|---|---|---|
| GL | 1.00 | 101 |

Water Strike

| Depth Strike (m) | Remarks |
|---|---|
| | Dry |

Sample Sleeve Runs

| Depth Top (m) | Depth Base (m) | Diameter (mm) |
|---|---|---|
| 0.00 | 1.00 | 87 |
| 1.00 | 2.00 | 87 |
| 2.00 | 3.00 | 77 |

# Window Sample Photos

**WS07**

Wenlock Tower Complex

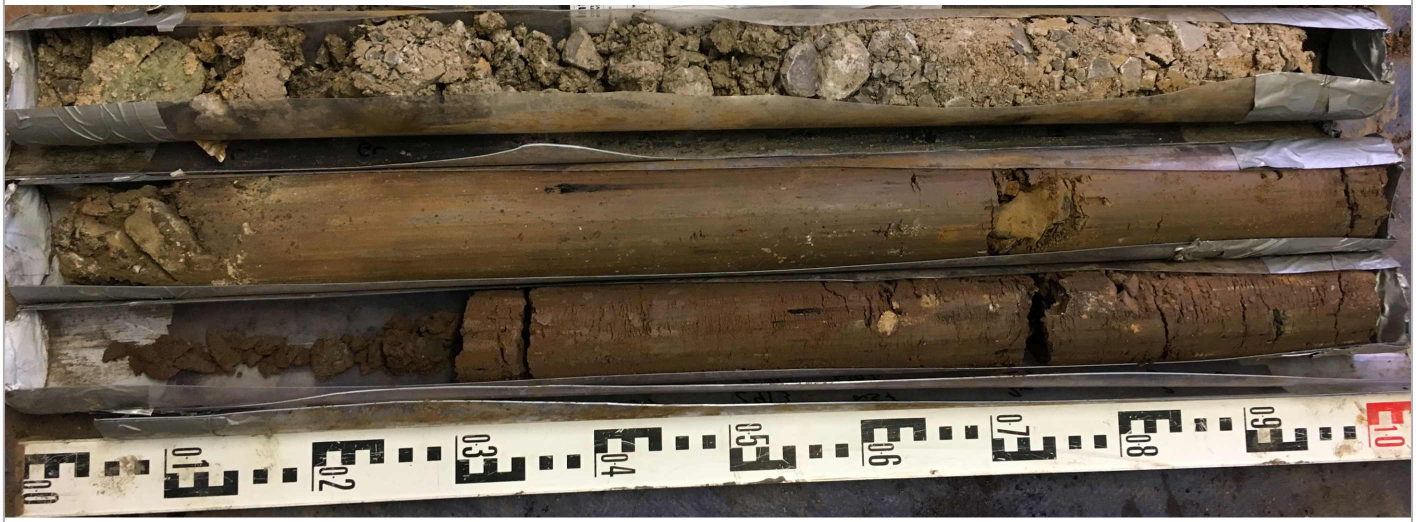

**Image 1.** WS07:
*Viewed left to right, top to bottom: 0.00m - 1.00m bgl, 1.00m - 2.00m bgl, 2.00m - 3.00m bgl.*

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# Window Sample Log

ver. 0.3

Window Sample No.
**WS08**
Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Project Name: | Wenlock Tower Complex | Co-ords: | 386835E - 396917N | Project No. | 2913A |
| Location: | West Gorton, Manchester | Level (m AOD): | 52.00 | Logged By | MB |
| | | Date: | 13/04/2017 | | |
| Client: | Manchester City Council | Weather: | Wet and overcast | Checked By | JG |

| Well / Backfill | Water Strikes | Sample and In Situ Testing Depth(m) | Type | Results | Depth (m) | Level (m AOD) | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | 0.30 | 51.70 | CONCRETE.<br>MADE GROUND |
| | | | | | 0.48 | 51.52 | Damp, greyish white, sandy, slightly clayey, angular to subrounded, fine to coarse GRAVEL of limestone.<br>SUB-BASE |
| | | | | | 0.90 | 51.10 | Dark brown to black SAND and GRAVEL. Gravel is angular to subangular of fine to coarse suspected slag (30%), red brick (20%), sandstone (20%) and mixed lithologies (30%).<br>MADE GROUND |
| | | 1.00 | SPT(C) | N=11 (1,2/2,2,3,4) | 1.10 | 50.90 | Soft to firm, grey CLAY. |
| | | 1.05<br>1.25 | | HVP=43<br>HVP=83 | 1.30 | 50.70 | Firm, yellowish orange, slightly gravelly, silty CLAY. Gravel is rounded of fine to medium sandstone.<br>GLACIAL TILL |
| | | 1.40<br>1.60<br>1.90 | | HVP=65<br>HVP=80<br>HVP=90 | 2.00 | 50.00 | Stiff, brown, mottled grey, slightly gravelly, silty CLAY. Gravel is subrounded of fine to medium sandstone and coal.<br>GLACIAL TILL<br>*Becoming very stiff from 1.80m bgl.* |
| | | 2.00<br>3.00 | SPT(C)<br>SPT(C) | N=42 (3,5/7,10,11,14)<br>50 (25 for 85mm/50 for 105mm) | 3.10 | 48.90 | Stiff, very friable, brown, slightly gravelly, very sandy CLAY. Gravel is rounded of fine to coarse mixed lithologies.<br>GLACIAL TILL |
| | | | | | 3.50 | 48.50 | Very stiff, brown, slightly gravelly, sandy CLAY. Gravel is subrounded of fine to medium sandstone.<br>GLACIAL TILL |
| | | | | | | | Window Sample terminated at 3.50m. |

1 2 3 4 5 6 7 8 9 10

Remarks:

A representative shear vane reading was not possible from 2.00m bgl due to the stiffness and high granular secondary content of the clay.

Window sample terminated at 3.00m bgl due to very stiff clay.

| Casing Details | | |
|---|---|---|
| Depth Top (m) | Depth Base (m) | Diameter (mm) |
| GL | 1.00 | 101 |

| Water Strike | |
|---|---|
| Depth Strike (m) | Remarks |
| | Dry |

| Sample Sleeve Runs | | |
|---|---|---|
| Depth Top (m) | Depth Base (m) | Diameter (mm) |
| 0.00 | 1.00 | 87 |
| 1.00 | 2.00 | 87 |
| 2.00 | 3.00 | 77 |
| 3.00 | 3.50 | 57 |

# Window Sample Photos

**WS08**

Wenlock Tower Complex

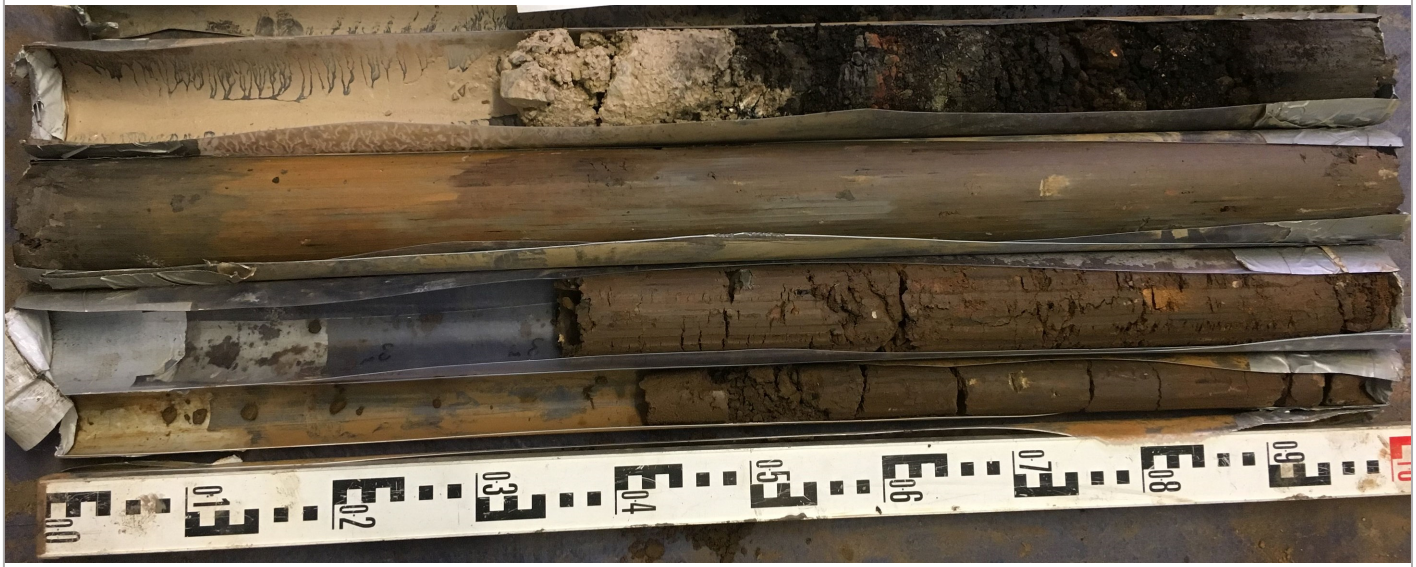

**Image 1.** WS08:
*Viewed left to right, top to bottom: 0.00m - 1.00m bgl, 1.00m - 2.00m bgl, 2.00m - 3.00m bgl, 3.00m - 3.50m bgl.*

# APPENDIX 4

# LABORATORY CHEMICAL TEST RESULTS

UKAS
TESTING
2183

Chemtest
The right chemistry to deliver results
**Chemtest Ltd.**
**Depot Road**
**Newmarket**
**CB8 0AL**
**Tel: 01638 606070**
**Email: info@chemtest.co.uk**

# Final Report

| | | | |
|---|---|---|---|
| **Report No.:** | 17-09436-1 | | |
| **Initial Date of Issue:** | 26-Apr-2017 | | |
| **Client** | Integra Consulting | | |
| **Client Address:** | 14 - 32 Hewitt Street<br>Manchester<br>M15 4GB | | |
| **Contact(s):** | James Greenfield | | |
| **Project** | 2913 Wenlock Tower Complex, West Gorton | | |
| **Quotation No.:** | Q14-02166 | **Date Received:** | 20-Apr-2017 |
| **Order No.:** | | **Date Instructed:** | 20-Apr-2017 |
| **No. of Samples:** | 3 | | |
| **Turnaround (Wkdays):** | 5 | **Results Due:** | 26-Apr-2017 |
| **Date Approved:** | 26-Apr-2017 | | |
| **Approved By:** | | | |
| **Details:** | Martin Dyer, Laboratory Manager | | |

# Results - Soil

**Project: 2913 Wenlock Tower Complex, West Gorton**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Client: Integra Consulting** | | | | **Chemtest Job No.:** | 17-09436 | 17-09436 | 17-09436 |
| Quotation No.: Q14-02166 | | | | **Chemtest Sample ID.:** | 441581 | 441582 | 441583 |
| Order No.: | | | | Client Sample Ref.: | WS07 | WS07 | WS08 |
| | | | | Sample Type: | SOIL | SOIL | SOIL |
| | | | | Top Depth (m): | 0.25 | 1.95 | 0.48 |
| | | | | Bottom Depth (m): | 1.00 | 2.00 | 0.90 |
| | | | | Date Sampled: | 19-Apr-2017 | 19-Apr-2017 | 19-Apr-2017 |
| | | | | Asbestos Lab: | COVENTRY | | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | |
| ACM Type | U | 2192 | | N/A | - | | - |
| Asbestos Identification | U | 2192 | % | 0.001 | No Asbestos Detected | | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | 3.2 | 9.0 | 15 |
| Stones | N | 2030 | % | 0.020 | < 0.020 | < 0.020 | < 0.020 |
| pH | U | 2010 | | N/A | 8.3 | 8.3 | 7.4 |
| Boron (Hot Water Soluble) | U | 2120 | mg/kg | 0.40 | < 0.40 | < 0.40 | 2.3 |
| Sulphate (2:1 Water Soluble) as SO4 | U | 2120 | g/l | 0.010 | 0.31 | 0.031 | 0.61 |
| Nitrate (Water Soluble) | N | 2220 | g/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Cyanide (Free) | U | 2300 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Cyanide (Total) | U | 2300 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Arsenic | U | 2450 | mg/kg | 1.0 | 28 | 18 | 29 |
| Barium | U | 2450 | mg/kg | 10 | 23 | 47 | 230 |
| Beryllium | U | 2450 | mg/kg | 1.0 | 1.3 | < 1.0 | 5.6 |
| Cadmium | U | 2450 | mg/kg | 0.10 | 1.2 | 0.49 | 0.31 |
| Chromium | U | 2450 | mg/kg | 1.0 | 8.8 | 13 | 23 |
| Copper | U | 2450 | mg/kg | 0.50 | 9.6 | 8.0 | 190 |
| Mercury | U | 2450 | mg/kg | 0.10 | 0.14 | < 0.10 | 0.31 |
| Nickel | U | 2450 | mg/kg | 0.50 | 15 | 14 | 72 |
| Lead | U | 2450 | mg/kg | 0.50 | 19 | 5.9 | 85 |
| Selenium | U | 2450 | mg/kg | 0.20 | < 0.20 | < 0.20 | < 0.20 |
| Vanadium | U | 2450 | mg/kg | 5.0 | 9.8 | 15 | 83 |
| Zinc | U | 2450 | mg/kg | 0.50 | 34 | 17 | 87 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Organic Matter | U | 2625 | % | 0.40 | 0.69 | 0.45 | 48 |
| TPH >C6-C10 | N | 2670 | mg/kg | 1.0 | < 1.0 | | 12 |
| TPH >C10-C21 | N | 2670 | mg/kg | 1.0 | 30 | | 67 |
| TPH >C21-C40 | N | 2670 | mg/kg | 1.0 | 66 | | 76 |
| Total TPH >C6-C40 | U | 2670 | mg/kg | 10 | 95 | < 10 | 160 |
| Naphthalene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | 1.3 |
| Acenaphthylene | N | 2800 | mg/kg | 0.10 | 0.10 | < 0.10 | < 0.10 |
| Acenaphthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluorene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Phenanthrene | U | 2800 | mg/kg | 0.10 | 0.48 | < 0.10 | 0.94 |
| Anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluoranthene | U | 2800 | mg/kg | 0.10 | 0.45 | < 0.10 | 0.22 |
| Pyrene | U | 2800 | mg/kg | 0.10 | 0.34 | < 0.10 | 0.30 |
| Benzo[a]anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |

# Results - Soil

**Project: 2913 Wenlock Tower Complex, West Gorton**

| **Client: Integra Consulting** | | | | **Chemtest Job No.:** | 17-09436 | 17-09436 | 17-09436 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q14-02166 | | | | **Chemtest Sample ID.:** | 441581 | 441582 | 441583 |
| Order No.: | | | | Client Sample Ref.: | WS07 | WS07 | WS08 |
| | | | | Sample Type: | SOIL | SOIL | SOIL |
| | | | | Top Depth (m): | 0.25 | 1.95 | 0.48 |
| | | | | Bottom Depth (m): | 1.00 | 2.00 | 0.90 |
| | | | | Date Sampled: | 19-Apr-2017 | 19-Apr-2017 | 19-Apr-2017 |
| | | | | Asbestos Lab: | COVENTRY | | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | |
| Chrysene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[a]pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Of 16 PAH's | N | 2800 | mg/kg | 2.0 | < 2.0 | < 2.0 | 2.8 |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 2010 | pH Value of Soils | pH | pH Meter |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2220 | Water soluble Chloride in Soils | Chloride | Aqueous extraction and measuremernt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate. |
| 2300 | Cyanides & Thiocyanate in Soils | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser. |
| 2450 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |
| 2490 | Hexavalent Chromium in Soils | Chromium [VI] | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2670 | Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40 | Dichloromethane extraction / GC-FID |
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene* | Dichloromethane extraction / GC-MS |

# Report Information

## Key

| | |
|---|---|
| U | UKAS accredited |
| M | MCERTS and UKAS accredited |
| N | Unaccredited |
| S | This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis |
| SN | This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis |
| T | This analysis has been subcontracted to an unaccredited laboratory |
| I/S | Insufficient Sample |
| U/S | Unsuitable Sample |
| N/E | not evaluated |
| < | "less than" |
| > | "greater than" |

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

## Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container

## Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk

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**CB8 0AL**
**Tel: 01638 606070**
**Email: info@chemtest.co.uk**

# Amended Report

| | | | |
|---|---|---|---|
| **Report No.:** | 17-09705-2 | | |
| **Initial Date of Issue:** | 28-Apr-2017 | **Date of Re-Issue:** | 04-May-2017 |
| **Client** | Integra Consulting | | |
| **Client Address:** | 14 - 32 Hewitt Street<br>Manchester<br>M15 4GB | | |
| **Contact(s):** | James Greenfield | | |
| **Project** | 2913 - Wenlock Tower Complex, West Gorton | | |
| **Quotation No.:** | Q14-02166 | **Date Received:** | 24-Apr-2017 |
| **Order No.:** | | **Date Instructed:** | 24-Apr-2017 |
| **No. of Samples:** | 2 | | |
| **Turnaround (Wkdays):** | 5 | **Results Due:** | 28-Apr-2017 |
| **Date Approved:** | 28-Apr-2017 | | |

**Approved By:**

KJones

**Details:** Keith Jones, Technical Manager

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# Results - Water

**Project: 2913 - Wenlock Tower Complex, West Gorton**

| **Client: Integra Consulting** | **Chemtest Job No.:** | | | | 17-09705 | 17-09705 |
|---|---|---|---|---|---|---|
| Quotation No.: Q14-02166 | **Chemtest Sample ID.:** | | | | 442844 | 442845 |
| Order No.: | Client Sample Ref.: | | | | BH06 | WS203 |
| | Sample Type: | | | | WATER | WATER |
| | Top Depth (m): | | | | 6.33 | 7.98 |
| | Date Sampled: | | | | 21-Apr-2017 | 21-Apr-2017 |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | |
| pH | U | 1010 | | N/A | 8.2 | 7.5 |
| Electrical Conductivity | U | 1020 | µS/cm | 1.0 | 1200 | 1400 |
| Chemical Oxygen Demand | U | 1100 | mg O2/l | 10 | 19 | 18 |
| Redox Potential | N | 1170 | mV | N/A | 130 | 130 |
| Total Hardness as CaCO3 | U | 1270 | mg/l | 15 | 610 | 820 |
| Arsenic (Dissolved) | U | 1450 | µg/l | 1.0 | 6.8 | 1.5 |
| Barium (Dissolved) | U | 1450 | µg/l | 5.0 | 200 | 160 |
| Beryllium (Dissolved) | U | 1450 | µg/l | 1.0 | < 1.0 | < 1.0 |
| Cadmium (Dissolved) | U | 1450 | µg/l | 0.080 | < 0.080 | < 0.080 |
| Cobalt (Dissolved) | U | 1450 | µg/l | 1.0 | 1.9 | < 1.0 |
| Chromium (Dissolved) | U | 1450 | µg/l | 1.0 | < 1.0 | 1.7 |
| Copper (Dissolved) | U | 1450 | µg/l | 1.0 | 1.1 | 1.4 |
| Mercury (Dissolved) | U | 1450 | µg/l | 0.50 | < 0.50 | < 0.50 |
| Nickel (Dissolved) | U | 1450 | µg/l | 1.0 | 4.7 | 8.8 |
| Lead (Dissolved) | U | 1450 | µg/l | 1.0 | < 1.0 | < 1.0 |
| Selenium (Dissolved) | U | 1450 | µg/l | 1.0 | 1.6 | < 1.0 |
| Vanadium (Dissolved) | U | 1450 | µg/l | 1.0 | < 1.0 | < 1.0 |
| Zinc (Dissolved) | U | 1450 | µg/l | 1.0 | 24 | 9.8 |
| Total TPH >C6-C40 | U | 1670 | µg/l | 10 | < 10 | < 10 |
| Naphthalene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Acenaphthylene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Acenaphthene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Fluorene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Phenanthrene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Anthracene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Fluoranthene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Pyrene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Benzo[a]anthracene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Chrysene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Benzo[a]pyrene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Total Of 16 PAH's | U | 1800 | µg/l | 2.0 | < 2.0 | < 2.0 |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 1010 | pH Value of Waters | pH | pH Meter |
| 1020 | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters | Conductivity Meter |
| 1090 | Biochemical Oxygen Demand | Biochemical Oxygen demand (BOD) | Electrometric determination of dissolved oxygen in seeded sample initially and after 5 days incubation at 20°C. |
| 1100 | Chemical Oxygen Demand | Chemical Oxygen demand (COD) | Dichromate oxidation of organic matter in sample followed by colorimetric determination of residual Cr[VI]. |
| 1170 | Redox Potential | Redox Potential | Meter |
| 1270 | Total Hardness of Waters | Total hardness | Calculation applied to calcium and magnesium results, expressed as mg l-1 $CaCO_3$ equivalent. |
| 1415 | Cations in Waters by ICP-MS | Sodium; Potassium; Calcium; Magnesium | Direct determination by inductively coupled plasma - mass spectrometry (ICP-MS). |
| 1450 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1670 | Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO | Pentane extraction / GC FID detection |
| 1800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Pentane extraction / GCMS detection |

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## Report Information

### Key

| | |
|---|---|
| U | UKAS accredited |
| M | MCERTS and UKAS accredited |
| N | Unaccredited |
| S | This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis |
| SN | This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis |
| T | This analysis has been subcontracted to an unaccredited laboratory |
| I/S | Insufficient Sample |
| U/S | Unsuitable Sample |
| N/E | not evaluated |
| < | "less than" |
| > | "greater than" |

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

### Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container

### Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk

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# Amended Report

| | | | |
|---|---|---|---|
| **Report No.:** | 17-09145-2 | | |
| **Initial Date of Issue:** | 24-Apr-2017 | **Date of Re-Issue:** | 09-May-2017 |
| **Client** | Integra Consulting | | |
| **Client Address:** | 14 - 32 Hewitt Street<br>Manchester<br>M15 4GB | | |
| **Contact(s):** | James Greenfield | | |
| **Project** | 2913 Wenlock Tower Complex, West Gorton | | |
| **Quotation No.:** | Q14-02166 | **Date Received:** | 18-Apr-2017 |
| **Order No.:** | | **Date Instructed:** | 18-Apr-2017 |
| **No. of Samples:** | 12 | | |
| **Turnaround (Wkdays):** | 13 | **Results Due:** | 05-May-2017 |
| **Date Approved:** | 09-May-2017 | | |
| **Approved By:** | | | |
| **Details:** | Martin Dyer, Laboratory Manager | | |

# Results - Soil

**Project: 2913 Wenlock Tower Complex, West Gorton**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Client: Integra Consulting** | **Chemtest Job No.:** | | | | 17-09145 | 17-09145 | 17-09145 | 17-09145 | 17-09145 | 17-09145 | 17-09145 | 17-09145 | 17-09145 |
| Quotation No.: Q14-02166 | **Chemtest Sample ID.:** | | | | 440143 | 440144 | 440145 | 440146 | 440147 | 440148 | 440149 | 440150 | 440151 |
| Order No.: | Client Sample Ref.: | | | | WS01 | WS01 | WS02A | WS02A | WS02A | WS03 | WS03 | WS04 | WS04 |
| | Client Sample ID.: | | | | | | | | | | | | |
| | Sample Type: | | | | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | Top Depth (m): | | | | 0.30 | 1.50 | 0.00 | 0.40 | 1.65 | 0.55 | 1.50 | 0.10 | 0.30 |
| | Bottom Depth (m): | | | | 0.85 | | 0.40 | 0.65 | 1.85 | 0.95 | 1.60 | 0.30 | 0.80 |
| | Date Sampled: | | | | 13-Apr-2017 | 13-Apr-2017 | 13-Apr-2017 | 13-Apr-2017 | 13-Apr-2017 | 13-Apr-2017 | 13-Apr-2017 | 13-Apr-2017 | 13-Apr-2017 |
| | Asbestos Lab: | | | | COVENTRY | | COVENTRY | COVENTRY | | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | | |
| ACM Type | U | 2192 | | N/A | - | | - | - | | - | - | - | Lagging |
| Asbestos Identification | U | 2192 | % | 0.001 | No Asbestos Detected | | No Asbestos Detected | No Asbestos Detected | | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | Amosite<br>Chrysotile |
| Asbestos by Gravimetry | U | 2192 | % | 0.001 | | | | | | | | | 5.6 |
| Total Asbestos | N | 2192 | % | 0.001 | | | | | | | | | 5.6 |
| Moisture | N | 2030 | % | 0.020 | 32 | 13 | 2.8 | 14 | 44 | 25 | 28 | 16 | 17 |
| Stones | N | 2030 | % | 0.020 | < 0.020 | < 0.020 | < 0.020 | < 0.020 | < 0.020 | < 0.020 | < 0.020 | < 0.020 | < 0.020 |
| pH | U | 2010 | | N/A | 8.2 | 8.8 | 6.6 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.9 |
| Boron (Hot Water Soluble) | U | 2120 | mg/kg | 0.40 | 0.41 | 1.0 | 0.71 | 0.95 | 0.69 | 6.3 | 0.86 | < 0.40 | < 0.40 |
| Sulphate (2:1 Water Soluble) as SO4 | U | 2120 | g/l | 0.010 | < 0.010 | 0.080 | 0.021 | 0.095 | 0.033 | 0.31 | 0.055 | < 0.010 | 0.18 |
| Nitrate (Water Soluble) | N | 2220 | g/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Cyanide (Free) | U | 2300 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Cyanide (Total) | U | 2300 | mg/kg | 0.50 | < 0.50 | < 0.50 | 1.7 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Arsenic | U | 2450 | mg/kg | 1.0 | 8.8 | 43 | 120 | 29 | 55 | 120 | 54 | 39 | 18 |
| Barium | U | 2450 | mg/kg | 10 | 240 | 73 | 960 | 390 | 420 | 640 | 150 | 520 | 350 |
| Beryllium | U | 2450 | mg/kg | 1.0 | 1.0 | < 1.0 | 3.7 | 1.7 | 3.0 | 2.9 | 1.2 | 1.9 | 1.3 |
| Cadmium | U | 2450 | mg/kg | 0.10 | 0.16 | 0.62 | 0.20 | 0.72 | 0.81 | 2.6 | 0.10 | 0.57 | 0.37 |
| Chromium | U | 2450 | mg/kg | 1.0 | 22 | 6.4 | 220 | 27 | 26 | 25 | 52 | 27 | 28 |
| Copper | U | 2450 | mg/kg | 0.50 | 23 | 8.5 | 450 | 110 | 140 | 240 | 3300 | 170 | 120 |
| Mercury | U | 2450 | mg/kg | 0.10 | < 0.10 | 0.10 | 2.8 | 0.78 | 0.92 | 2.1 | 0.32 | 1.5 | 0.52 |
| Nickel | U | 2450 | mg/kg | 0.50 | 36 | 7.2 | 61 | 29 | 52 | 56 | 69 | 41 | 31 |
| Lead | U | 2450 | mg/kg | 0.50 | 14 | 22 | 3000 | 480 | 380 | 900 | 1300 | 350 | 220 |
| Selenium | U | 2450 | mg/kg | 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 |
| Vanadium | U | 2450 | mg/kg | 5.0 | 18 | < 5.0 | 62 | 32 | 50 | 67 | 120 | 49 | 35 |
| Zinc | U | 2450 | mg/kg | 0.50 | 50 | 14 | 91 | 160 | 250 | 2100 | 860 | 220 | 330 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Organic Matter | U | 2625 | % | 0.40 | 1.6 | 4.5 | 50 | 22 | 24 | 31 | 17 | 33 | 7.9 |
| TPH >C6-C10 | N | 2670 | mg/kg | 1.0 | < 1.0 | | | < 1.0 | < 1.0 | 25 | < 1.0 | < 1.0 | < 1.0 |
| TPH >C10-C21 | N | 2670 | mg/kg | 1.0 | 15 | | | 38 | < 1.0 | 130 | 6.2 | 47 | 24 |
| TPH >C21-C40 | N | 2670 | mg/kg | 1.0 | 30 | | | 110 | < 1.0 | 150 | 17 | 120 | 40 |
| Total TPH >C6-C40 | U | 2670 | mg/kg | 10 | 45 | < 10 | 120 | 150 | < 10 | 300 | 23 | 160 | 64 |
| Naphthalene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | 1.4 | 0.76 | 0.44 | 3.4 | 0.97 | 8.4 | 0.80 |
| Acenaphthylene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.15 | < 0.10 |
| Acenaphthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | 0.20 | 0.30 | 0.27 | 0.44 | 0.20 | 0.63 | 1.1 |
| Fluorene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.26 | 0.32 | 0.27 | 0.17 | 0.70 | 0.63 |
| Phenanthrene | U | 2800 | mg/kg | 0.10 | < 0.10 | 0.28 | 1.4 | 3.3 | 3.6 | 3.8 | 1.9 | 7.4 | 8.3 |

# Results - Soil

**Project: 2913 Wenlock Tower Complex, West Gorton**

| **Client: Integra Consulting** | **Chemtest Job No.:** | | | | 17-09145 | 17-09145 | 17-09145 | 17-09145 | 17-09145 | 17-09145 | 17-09145 | 17-09145 | 17-09145 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q14-02166 | **Chemtest Sample ID.:** | | | | 440143 | 440144 | 440145 | 440146 | 440147 | 440148 | 440149 | 440150 | 440151 |
| Order No.: | Client Sample Ref.: | | | | WS01 | WS01 | WS02A | WS02A | WS02A | WS03 | WS03 | WS04 | WS04 |
| | Client Sample ID.: | | | | | | | | | | | | |
| | Sample Type: | | | | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | Top Depth (m): | | | | 0.30 | 1.50 | 0.00 | 0.40 | 1.65 | 0.55 | 1.50 | 0.10 | 0.30 |
| | Bottom Depth (m): | | | | 0.85 | | 0.40 | 0.65 | 1.85 | 0.95 | 1.60 | 0.30 | 0.80 |
| | Date Sampled: | | | | 13-Apr-2017 | 13-Apr-2017 | 13-Apr-2017 | 13-Apr-2017 | 13-Apr-2017 | 13-Apr-2017 | 13-Apr-2017 | 13-Apr-2017 | 13-Apr-2017 |
| | Asbestos Lab: | | | | COVENTRY | | COVENTRY | COVENTRY | | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | | |
| Anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | 0.23 | 0.62 | 0.85 | 0.46 | 0.47 | 1.3 | 1.8 |
| Fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | 0.40 | 1.2 | 4.6 | 5.4 | 2.6 | 2.4 | 7.9 | 12 |
| Pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | 0.29 | 1.3 | 4.1 | 4.9 | 2.6 | 2.7 | 8.7 | 11 |
| Benzo[a]anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | 0.52 | 1.4 | 1.6 | 1.0 | 1.5 | 3.4 | 4.5 |
| Chrysene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | 0.52 | 1.5 | 2.0 | 1.2 | 1.7 | 4.1 | 5.8 |
| Benzo[b]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | 0.66 | 1.7 | 1.9 | 0.74 | 1.6 | 3.6 | 5.5 |
| Benzo[k]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | 0.16 | 0.45 | 0.47 | 0.20 | 0.56 | 1.4 | 1.8 |
| Benzo[a]pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | 0.34 | 1.1 | 1.4 | 0.51 | 1.6 | 2.8 | 3.8 |
| Indeno(1,2,3-c,d)Pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | 0.14 | 0.70 | 0.82 | 0.26 | 0.90 | 2.1 | 2.8 |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.30 | 0.32 |
| Benzo[g,h,i]perylene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | 0.31 | 0.73 | 0.91 | 0.38 | 0.91 | 2.1 | 2.5 |
| Total Of 16 PAH's | N | 2800 | mg/kg | 2.0 | < 2.0 | < 2.0 | 8.4 | 22 | 25 | 18 | 18 | 55 | 63 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Client: Integra Consulting** | **Chemtest Job No.:** | | | | 17-09145 | 17-09145 | 17-09145 |
| Quotation No.: Q14-02166 | **Chemtest Sample ID.:** | | | | 440152 | 440153 | 445365 |
| Order No.: | Client Sample Ref.: | | | | WS05 | WS05 | WS02A |
| | Client Sample ID.: | | | | | | Retest of 440145 |
| | Sample Type: | | | | SOIL | SOIL | SOIL |
| | Top Depth (m): | | | | 0.25 | 1.30 | 0.00 |
| | Bottom Depth (m): | | | | 0.40 | | 0.40 |
| | Date Sampled: | | | | 13-Apr-2017 | 13-Apr-2017 | 13-Apr-2017 |
| | Asbestos Lab: | | | | COVENTRY | | |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | |
| ACM Type | U | 2192 | | N/A | - | | |
| Asbestos Identification | U | 2192 | % | 0.001 | No Asbestos Detected | | |
| Asbestos by Gravimetry | U | 2192 | % | 0.001 | | | |
| Total Asbestos | N | 2192 | % | 0.001 | | | |
| Moisture | N | 2030 | % | 0.020 | 12 | 22 | 5.7 |
| Stones | N | 2030 | % | 0.020 | < 0.020 | < 0.020 | |
| pH | U | 2010 | | N/A | 8.2 | 7.3 | |
| Boron (Hot Water Soluble) | U | 2120 | mg/kg | 0.40 | < 0.40 | 0.44 | 1.3 |
| Sulphate (2:1 Water Soluble) as SO4 | U | 2120 | g/l | 0.010 | 0.013 | 0.072 | < 0.010 |
| Nitrate (Water Soluble) | N | 2220 | g/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Cyanide (Free) | U | 2300 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Cyanide (Total) | U | 2300 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Arsenic | U | 2450 | mg/kg | 1.0 | 22 | 11 | 25 |
| Barium | U | 2450 | mg/kg | 10 | 150 | 96 | 90 |
| Beryllium | U | 2450 | mg/kg | 1.0 | 1.6 | 1.1 | < 1.0 |
| Cadmium | U | 2450 | mg/kg | 0.10 | 0.14 | < 0.10 | 0.89 |
| Chromium | U | 2450 | mg/kg | 1.0 | 24 | 34 | 7.4 |
| Copper | U | 2450 | mg/kg | 0.50 | 79 | 28 | 18 |
| Mercury | U | 2450 | mg/kg | 0.10 | 0.21 | < 0.10 | 0.12 |
| Nickel | U | 2450 | mg/kg | 0.50 | 39 | 29 | 9.0 |
| Lead | U | 2450 | mg/kg | 0.50 | 62 | 25 | 47 |
| Selenium | U | 2450 | mg/kg | 0.20 | < 0.20 | < 0.20 | < 0.20 |
| Vanadium | U | 2450 | mg/kg | 5.0 | 54 | 36 | 5.1 |
| Zinc | U | 2450 | mg/kg | 0.50 | 66 | 53 | 29 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Organic Matter | U | 2625 | % | 0.40 | 17 | 1.2 | 4.5 |
| TPH >C6-C10 | N | 2670 | mg/kg | 1.0 | < 1.0 | | |
| TPH >C10-C21 | N | 2670 | mg/kg | 1.0 | < 1.0 | | |
| TPH >C21-C40 | N | 2670 | mg/kg | 1.0 | < 1.0 | | |
| Total TPH >C6-C40 | U | 2670 | mg/kg | 10 | < 10 | < 10 | |
| Naphthalene | U | 2800 | mg/kg | 0.10 | 0.39 | < 0.10 | |
| Acenaphthylene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | |
| Acenaphthene | U | 2800 | mg/kg | 0.10 | 0.13 | < 0.10 | |
| Fluorene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | |
| Phenanthrene | U | 2800 | mg/kg | 0.10 | 2.1 | < 0.10 | |

# Results - Soil

**Project: 2913 Wenlock Tower Complex, West Gorton**

| **Client: Integra Consulting** | **Chemtest Job No.:** | | | | 17-09145 | 17-09145 | 17-09145 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q14-02166 | **Chemtest Sample ID.:** | | | | 440152 | 440153 | 445365 |
| Order No.: | Client Sample Ref.: | | | | WS05 | WS05 | WS02A |
| | Client Sample ID.: | | | | | | Retest of 440145 |
| | Sample Type: | | | | SOIL | SOIL | SOIL |
| | Top Depth (m): | | | | 0.25 | 1.30 | 0.00 |
| | Bottom Depth (m): | | | | 0.40 | | 0.40 |
| | Date Sampled: | | | | 13-Apr-2017 | 13-Apr-2017 | 13-Apr-2017 |
| | Asbestos Lab: | | | | COVENTRY | | |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | |
| Anthracene | U | 2800 | mg/kg | 0.10 | 0.35 | < 0.10 | |
| Fluoranthene | U | 2800 | mg/kg | 0.10 | 3.6 | < 0.10 | |
| Pyrene | U | 2800 | mg/kg | 0.10 | 3.1 | < 0.10 | |
| Benzo[a]anthracene | U | 2800 | mg/kg | 0.10 | 0.99 | < 0.10 | |
| Chrysene | U | 2800 | mg/kg | 0.10 | 1.1 | < 0.10 | |
| Benzo[b]fluoranthene | U | 2800 | mg/kg | 0.10 | 1.0 | < 0.10 | |
| Benzo[k]fluoranthene | U | 2800 | mg/kg | 0.10 | 0.22 | < 0.10 | |
| Benzo[a]pyrene | U | 2800 | mg/kg | 0.10 | 0.49 | < 0.10 | |
| Indeno(1,2,3-c,d)Pyrene | U | 2800 | mg/kg | 0.10 | 0.29 | < 0.10 | |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | |
| Benzo[g,h,i]perylene | U | 2800 | mg/kg | 0.10 | 0.41 | < 0.10 | |
| Total Of 16 PAH's | N | 2800 | mg/kg | 2.0 | 14 | < 2.0 | |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 2010 | pH Value of Soils | pH | pH Meter |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2220 | Water soluble Chloride in Soils | Chloride | Aqueous extraction and measuremernt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate. |
| 2300 | Cyanides & Thiocyanate in Soils | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser. |
| 2450 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |
| 2490 | Hexavalent Chromium in Soils | Chromium [VI] | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2670 | Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40 | Dichloromethane extraction / GC-FID |
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene* | Dichloromethane extraction / GC-MS |

## Report Information

**Key**

| | |
|---|---|
| U | UKAS accredited |
| M | MCERTS and UKAS accredited |
| N | Unaccredited |
| S | This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis |
| SN | This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis |
| T | This analysis has been subcontracted to an unaccredited laboratory |
| I/S | Insufficient Sample |
| U/S | Unsuitable Sample |
| N/E | not evaluated |
| < | "less than" |
| > | "greater than" |

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

**Sample Deviation Codes**

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container

**Sample Retention and Disposal**

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk

UKAS
TESTING
2183

The right chemistry to deliver results
**Chemtest Ltd.**
**Depot Road**
**Newmarket**
**CB8 0AL**
**Tel: 01638 606070**
**Email: info@chemtest.co.uk**

# Amended Report

|  |  |  |  |
|---|---|---|---|
| **Report No.:** | 17-10110-3 |  |  |
| **Initial Date of Issue:** | 04-May-2017 | **Date of Re-Issue:** | 08-May-2017 |
| **Client** | Integra Consulting |  |  |
| **Client Address:** | 14 - 32 Hewitt Street<br>Manchester<br>M15 4GB |  |  |
| **Contact(s):** | James Greenfield |  |  |
| **Project** | 2913 - Wenlock Tower Complex, West Gorton |  |  |
| **Quotation No.:** | Q14-02166 | **Date Received:** | 27-Apr-2017 |
| **Order No.:** |  | **Date Instructed:** | 27-Apr-2017 |
| **No. of Samples:** | 1 |  |  |
| **Turnaround (Wkdays):** | 7 | **Results Due:** | 08-May-2017 |
| **Date Approved:** | 08-May-2017 |  |  |

**Approved By:**

**Details:** Glynn Harvey, Laboratory Manager

Chemtest
The right chemistry to deliver results

# Results - Water

**Project: 2913 - Wenlock Tower Complex, West Gorton**

| | | | | | |
|---|---|---|---|---|---|
| **Client: Integra Consulting** | | | | **Chemtest Job No.:** | 17-10110 |
| Quotation No.: Q14-02166 | | | | **Chemtest Sample ID.:** | 444749 |
| Order No.: | | | | Client Sample Ref.: | WS02A |
| | | | | Sample Type: | WATER |
| | | | | Top Depth (m): | 2.00 |
| | | | | Date Sampled: | 26-Apr-2017 |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | |
| pH | U | 1010 | | N/A | 7.4 |
| Electrical Conductivity | U | 1020 | µS/cm | 1.0 | 1100 |
| Chemical Oxygen Demand | U | 1100 | mg O2/l | 10 | < 10 |
| Redox Potential | N | 1170 | mV | N/A | 66 |
| Total Hardness as CaCO3 | U | 1270 | mg/l | 15 | 600 |
| Arsenic (Dissolved) | U | 1450 | µg/l | 1.0 | 4.9 |
| Barium (Dissolved) | U | 1450 | µg/l | 5.0 | 51 |
| Beryllium (Dissolved) | U | 1450 | µg/l | 1.0 | < 1.0 |
| Cadmium (Dissolved) | U | 1450 | µg/l | 0.080 | < 0.080 |
| Cobalt (Dissolved) | U | 1450 | µg/l | 1.0 | 2.4 |
| Chromium (Dissolved) | U | 1450 | µg/l | 1.0 | 1.5 |
| Copper (Dissolved) | U | 1450 | µg/l | 1.0 | < 1.0 |
| Mercury (Dissolved) | U | 1450 | µg/l | 0.50 | < 0.50 |
| Nickel (Dissolved) | U | 1450 | µg/l | 1.0 | 4.6 |
| Lead (Dissolved) | U | 1450 | µg/l | 1.0 | < 1.0 |
| Selenium (Dissolved) | U | 1450 | µg/l | 1.0 | 4.9 |
| Vanadium (Dissolved) | U | 1450 | µg/l | 1.0 | < 1.0 |
| Zinc (Dissolved) | U | 1450 | µg/l | 1.0 | 64 |
| Dissolved Organic Carbon | U | 1610 | mg/l | 2.0 | 8.3 |
| Total TPH >C6-C40 | U | 1670 | µg/l | 10 | < 10 |
| Naphthalene | U | 1800 | µg/l | 0.10 | < 0.10 |
| Acenaphthylene | U | 1800 | µg/l | 0.10 | < 0.10 |
| Acenaphthene | U | 1800 | µg/l | 0.10 | < 0.10 |
| Fluorene | U | 1800 | µg/l | 0.10 | < 0.10 |
| Phenanthrene | U | 1800 | µg/l | 0.10 | < 0.10 |
| Anthracene | U | 1800 | µg/l | 0.10 | < 0.10 |
| Fluoranthene | U | 1800 | µg/l | 0.10 | < 0.10 |
| Pyrene | U | 1800 | µg/l | 0.10 | < 0.10 |
| Benzo[a]anthracene | U | 1800 | µg/l | 0.10 | < 0.10 |
| Chrysene | U | 1800 | µg/l | 0.10 | < 0.10 |
| Benzo[b]fluoranthene | U | 1800 | µg/l | 0.10 | < 0.10 |
| Benzo[k]fluoranthene | U | 1800 | µg/l | 0.10 | < 0.10 |
| Benzo[a]pyrene | U | 1800 | µg/l | 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | U | 1800 | µg/l | 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | U | 1800 | µg/l | 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 1800 | µg/l | 0.10 | < 0.10 |
| Total Of 16 PAH's | U | 1800 | µg/l | 2.0 | < 2.0 |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 1010 | pH Value of Waters | pH | pH Meter |
| 1020 | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters | Conductivity Meter |
| 1090 | Biochemical Oxygen Demand | Biochemical Oxygen demand (BOD) | Electrometric determination of dissolved oxygen in seeded sample initially and after 5 days incubation at 20°C. |
| 1100 | Chemical Oxygen Demand | Chemical Oxygen demand (COD) | Dichromate oxidation of organic matter in sample followed by colorimetric determination of residual Cr[VI]. |
| 1170 | Redox Potential | Redox Potential | Meter |
| 1270 | Total Hardness of Waters | Total hardness | Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO3 equivalent. |
| 1415 | Cations in Waters by ICP-MS | Sodium; Potassium; Calcium; Magnesium | Direct determination by inductively coupled plasma - mass spectrometry (ICP-MS). |
| 1450 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1610 | Total/Dissolved Organic Carbon in Waters | Organic Carbon | TOC Analyser using Catalytic Oxidation |
| 1670 | Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO | Pentane extraction / GC FID detection |
| 1800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Pentane extraction / GCMS detection |

## Report Information

### Key

| | |
|---|---|
| U | UKAS accredited |
| M | MCERTS and UKAS accredited |
| N | Unaccredited |
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| T | This analysis has been subcontracted to an unaccredited laboratory |
| I/S | Insufficient Sample |
| U/S | Unsuitable Sample |
| N/E | not evaluated |
| < | "less than" |
| > | "greater than" |

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The results relate only to the items tested
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None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

### Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container

### Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk

# APPENDIX 5

# GROUND GAS AND GROUNDWATER DEPTH MONITORING RESULTS

**Gas Monitoring**

Site: Wenlock Tower Complex, Gorton
Recent weather: Showers
Precipitation: None
Job No.: 2913
Date: 20/04/2017
Air temperature: 13.3$^{o}$
Ground condition: Dry
Engineer: JG & MB
Start time: 15:20
Cloud cover: 100%
Pressure trend: Steady
Visit No.: 1
End time: 16:05
Wind velocity and direction: 13mph NW
On-site activities (e.g.construction): None

| Exploratory hole | Time | Response zone range | Water level | Base level | Atm. pressure | $CH_4$ | | LEL | | $CO_2$ | | $O_2$ | | | $H_2S$ | | Flow | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (m) | (m bgl) | (m bgl) | (mbar) | (%) | | (%) | | (%) | | (%) | | | (ppm) | | (l/hr) | |
| | | | | | | peak | steady | peak | steady | peak | steady | high | steady | low | peak | steady | peak | steady |
| WS02A | 15:20 | 1.00-3.00 | 1.70 | 2.55 | 1025 | 0.0 | 0.0 | 0.0 | 0.0 | 5.5 | 5.5 | 20.5 | 14.4 | 14.3 | 0 | 0 | 0.0 | 0.0 |
| WS05 | 15:35 | 1.00-3.00 | Dry | 2.67 | 1025 | 0.0 | 0.0 | 0.0 | 0.0 | 3.6 | 3.6 | 20.3 | 17.6 | 17.6 | 0 | 0 | 0.2 | 0.0 |
| WS07 | 15:55 | 1.00-3.00 | Dry | 2.57 | 1025 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | 0.7 | 19.8 | 19.8 | 19.8 | 0 | 0 | 0.0 | 0.0 |
| WS08 | 15:50 | 1.00-3.00 | Dry | 2.61 | 1025 | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 | 1.2 | 18.5 | 18.5 | 18.4 | 0 | 0 | 0.0 | 0.0 |
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Comments:

**Gas Monitoring**

Site: Wenlock Tower Complex, Gorton

Job No.: 2913

Date: 26/04/2017

Engineer: JG & MB

Start time: 11:40

Visit No.: 2

End time: 12:40

Recent weather: Rain

Air temperature: 8.1°

Cloud cover: 60%

Wind velocity and direction: 8mph NNW

Precipitation: None

Ground condition: Dry

Pressure trend: Steady

On-site activities (e.g.construction): None

| Exploratory hole | Time | Response zone range | Water level | Base level | Atm. pressure | $CH_4$ | | LEL | | $CO_2$ | | $O_2$ | | | $H_2S$ | | Flow | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | (%) | | (%) | | (%) | | (%) | | | (ppm) | | (l/hr) | |
| | | (m) | (m bgl) | (m bgl) | (mbar) | peak | steady | peak | steady | peak | steady | high | steady | low | peak | steady | peak | steady |
| WS02A | 11:40 | 1.00-3.00 | 1.72 | 2.55 | 1010 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.6 | 20.1 | 19.8 | 19.8 | 0 | 0 | 0.0 | 0.0 |
| WS05 | 12:20 | 1.00-3.00 | Dry | 2.70 | 1010 | 0.0 | 0.0 | 0.0 | 0.0 | 2.4 | 2.4 | 18.4 | 18.4 | 18.4 | 0 | 0 | 0.0 | 0.0 |
| WS07 | 12:30 | 1.00-3.00 | Dry | 2.58 | 1010 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | 0.7 | 19.1 | 19.1 | 19.1 | 0 | 0 | 0.0 | 0.0 |
| WS08 | 12:36 | 1.00-3.00 | Dry | 2.62 | 1010 | 0.0 | 0.0 | 0.0 | 0.0 | 1.7 | 1.7 | 20.6 | 18.7 | 18.7 | 0 | 0 | 0.0 | 0.0 |
| WS203 | 12:14 | 3.00-8.50 | 6.72 | 8.46 | | | | | | | | | | | | | | |
| BH06 | 12:15 | 2.00-9.50 | 2.17 | 8.89 | | | | | | | | | | | | | | |
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Comments: WS203 and BH06 were monitored for groundwater level only.

**Gas Monitoring**

Site: Wenlock Tower Complex, Gorton
Job No.: 2913
Date: 12/05/2017
Engineer: JG
Start time: 10:30
Visit No.: 3
End time: 11:40

Recent weather: Dry
Air temperature: 11.8°
Cloud cover: 100%
Wind velocity and direction: 6mph E

Precipitation: Wet
Ground condition: Wet
Pressure trend: Rising
On-site activities (e.g.construction): None

| Exploratory hole | Time | Response zone range | Water level | Base level | Atm. pressure | $CH_4$ | | LEL | | $CO_2$ | | $O_2$ | | | $H_2S$ | | Flow | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (m) | (m bgl) | (m bgl) | (mbar) | (%) | | (%) | | (%) | | (%) | | | (ppm) | | (l/hr) | |
| | | | | | | peak | steady | peak | steady | peak | steady | high | steady | low | peak | steady | peak | steady |
| WS02A | 10:30 | 1.00-3.00 | 1.72 | 2.55 | 987 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 19.8 | 19.8 | 19.8 | 0 | 0 | 0.0 | 0.0 |
| WS05 | 11:05 | 1.00-3.00 | Dry | 2.69 | 987 | 0.0 | 0.0 | 0.0 | 0.0 | 1.7 | 1.7 | 19.4 | 19.4 | 19.4 | 0 | 0 | 0.0 | 0.0 |
| WS07 | 11:20 | 1.00-3.00 | Dry | 2.55 | 987 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.6 | 19.5 | 19.5 | 19.4 | 0 | 0 | 0.0 | 0.0 |
| WS08 | 11:30 | 1.00-3.00 | Dry | 2.60 | 987 | 0.0 | 0.0 | 0.0 | 0.0 | 2.1 | 2.1 | 17.6 | 17.6 | 17.6 | 0 | 0 | 0.0 | 0.0 |
| WS203 | 10:45 | 3.00-8.50 | 6.65 | 8.44 | | | | | | | | | | | | | | |
| BH06 | 10:55 | 2.00-9.50 | 1.66 | 8.80 | | | | | | | | | | | | | | |
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Comments: WS203 and BH06 were monitored for groundwater level only.

## Gas Monitoring

Site: Wenlock Tower Complex, Gorton
Recent weather: Dry
Precipitation: Dry

Job No.: 2913
Date: 25/05/2017
Air temperature: 22.2°
Ground condition: Dry

Engineer: JG
Start time: 10:45
Cloud cover: 10%
Pressure trend: Falling

Visit No.: 4
End time: 11:45
Wind velocity and direction: 6mph SSW
On-site activities (e.g.construction): None

| Exploratory hole | Time | Response zone range | Water level | Base level | Atm. pressure | $CH_4$ | | LEL | | $CO_2$ | | $O_2$ | | | $H_2S$ | | Flow | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (m) | (m bgl) | (m bgl) | (mbar) | (%) | | (%) | | (%) | | (%) | | | (ppm) | | (l/hr) | |
| | | | | | | peak | steady | peak | steady | peak | steady | high | steady | low | peak | steady | peak | steady |
| WS02A | 10:55 | 1.00-3.00 | 1.67 | 2.54 | 1016 | 0.0 | 0.0 | 0.0 | 0.0 | 4.6 | 4.6 | 15.8 | 15.8 | 15.8 | 0 | 0 | 0.0 | 0.0 |
| WS05 | 11:10 | 1.00-3.00 | Dry | 2.69 | 1017 | 0.0 | 0.0 | 0.0 | 0.0 | 1.9 | 1.9 | 19.4 | 19.4 | 19.4 | 0 | 0 | 0.0 | 0.0 |
| WS07 | 11:25 | 1.00-3.00 | Dry | 2.57 | 1017 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.6 | 19.2 | 19.2 | 19.2 | 0 | 0 | 0.0 | 0.0 |
| WS08 | 11:35 | 1.00-3.00 | Dry | 2.61 | 1017 | 0.0 | 0.0 | 0.0 | 0.0 | 2.1 | 2.1 | 17.1 | 17.1 | 17.1 | 0 | 0 | 0.0 | 0.0 |
| WS203 | 10:50 | 3.00-8.50 | 6.74 | 8.43 | | | | | | | | | | | | | | |
| BH06 | 10:45 | 2.00-9.50 | 1.55 | 8.80 | | | | | | | | | | | | | | |
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Comments: WS203 and BH06 were monitored for groundwater level only.

**Gas Monitoring**

Site: Wenlock Tower Complex, Gorton
Recent weather: Dry
Precipitation: Dry

Job No.: 2913
Date: 13/06/2017
Air temperature: 17.0°
Ground condition: Dry

Engineer: JG
Start time: 10:50
Cloud cover: 50%
Pressure trend: Falling

Visit No.: 5
End time: 11:40
Wind velocity and direction: 5mph SW
On-site activities (e.g.construction): None

| Exploratory hole | Time | Response zone range | Water level | Base level | Atm. pressure | $CH_4$ | | LEL | | $CO_2$ | | $O_2$ | | | $H_2S$ | | Flow | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (m) | (m bgl) | (m bgl) | (mbar) | (%) | | (%) | | (%) | | (%) | | | (ppm) | | (l/hr) | |
| | | | | | | peak | steady | peak | steady | peak | steady | high | steady | low | peak | steady | peak | steady |
| WS02A | 10:55 | 1.00-3.00 | 1.62 | 2.54 | 1011 | 0.0 | 0.0 | 0.0 | 0.0 | 7.8 | 7.8 | 12.7 | 12.7 | 12.7 | 0 | 0 | 0.0 | 0.0 |
| WS05 | 11:07 | 1.00-3.00 | Dry | 2.69 | 1010 | 0.0 | 0.0 | 0.0 | 0.0 | 1.8 | 1.8 | 19.3 | 19.3 | 19.3 | 0 | 0 | 0.3 | 0.0 |
| WS07 | 11:22 | 1.00-3.00 | Dry | 2.57 | 1009 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 0.8 | 18.6 | 18.6 | 18.6 | 0 | 0 | 0.0 | 0.0 |
| WS08 | 11:28 | 1.00-3.00 | Dry | 2.61 | 1009 | 0.0 | 0.0 | 0.0 | 0.0 | 2.2 | 2.2 | 18.0 | 18.0 | 18.0 | 0 | 0 | 0.0 | 0.0 |
| WS203 | 10:58 | 3.00-8.50 | 6.68 | 8.44 | | | | | | | | | | | | | | |
| BH06 | 11:01 | 2.00-9.50 | 1.63 | 8.79 | | | | | | | | | | | | | | |
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Comments: WS203 and BH06 were monitored for groundwater level only.

| TEST DATE AND CONDITIONS | |
|---|---|
| Date | 25/05/16 |
| Atmospheric Pressure | 1006mB |
| Ambient Temp | 21.3°C |
| Environics Serial No. | 3268 |

**GAS DATA LTD**
Pegasus House
Seven Stars Estate
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Coventry
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Tel 02476303311 Fax 02476307711

# GFM430-1 FINAL INSPECTION & CALIBRATION CHECK CERTIFICATE

| INSTRUMENT DETAILS | |
|---|---|
| Serial No | Customer |
| 10181 | Integra Consulting Engineers |

| INSTRUMENT CHECKS | | | |
|---|---|---|---|
| Keyboard | ✓ | Pump Flow | 400cc/min |
| Display Contrast | ✓ | Pump Flow @ -200mB | 275cc/min |
| Clock Set / Running | ✓ | S/W Version | G430.0024/0013 |
| Labels Fitted | ✓ | Recalibration Date | 25/05/17 |

## GAS CHECKS

| Calibration Gas | | Instrument Gas Channels Read | | | | | |
|---|---|---|---|---|---|---|---|
| Gas Type | Applied Conc. | CH4 ( % ) | tol. ( % vol. ) | CO2 ( % ) | tol. ( % vol. ) | O2 ( % ) | tol. ( % vol. ) |
| N2 | 100% | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | +0.1 |
| CH4 | 5 % | 5.2 | +/-0.3 | 0.0 | 0.0 | 0.0 | +0.1 |
| | 60% | 60.1 | +/-3.0 | 0.0 | 0.0 | 0.0 | +0.1 |
| CO2 | 5% | 0.0 | 0.0 | 5.1 | +/-0.3 | 0.0 | +0.1 |
| | 40% | 0.0 | 0.0 | 39.8 | +/-3.0 | 0.0 | +0.1 |
| Air (20.9% O2, 400ppm CO2) | 100% | 0.0 | 0.0 | 0.0 | +0.1 | 20.9 | +/-0.5 |

## OPTIONAL GAS CHECKS

| Calibration Gas | | Instrument Gas Channels Read | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Gas Type | Applied Conc. | Label | H2S | | | | | tol. (% vol.) |
| | | Range | 2000ppm | | | | | |
| N2 | 100% | | 0 | | | | | 0.0 |
| H2S | 100ppm | | 103 | | | | | +/- 5.0 |
| H2S | 1500ppm | | 1505 | | | | | +/- 5.0 |
| | | | | | | | | +/- 5.0 |
| | | | | | | | | +/- 5.0 |
| | | | | | | | | +/- 5.0 |

| TEST DATE AND CONDITIONS | |
|---|---|
| Date | 25/05/16 |
| Atmospheric Pressure | 1006mB |
| Ambient Temp | 21.3°C |
| Environics Serial No. | 3268 |

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# GFM430-1 FINAL INSPECTION & CALIBRATION CHECK CERTIFICATE

| PRESSURE CHECKS | | | | | | | |
|---|---|---|---|---|---|---|---|
| Calibration Pressure | | Instrument Pressure Channels Read | | | | | |
| Pressure @ | Applied Pressure | Atmospheric [Ap] ( mB ) | tol. ( mB ) | | | | |
| All Ports | Current Atmospheric | 1006 | +/-2.0 | | | | |
| Ap Port (Internal) | +800mB(a) | 800 | +/-5.0 | | | | |
| | +1200mB(a) | 1200 | +/-5.0 | | | | |

| FLOW CHECKS | | | | | |
|---|---|---|---|---|---|
| Calibration Flow | | Instrument Flow Channels Read | | | |
| Applied Flow (l/hour) | Applied Pressure (Pa) | Flow [Flow] ( l/hour ) | tol. ( l/hour ) | Differential Pressure [Dp] ( Pa ) | tol. ( Pa ) |
| -30.0 | -265 | -28.3 | +/-3.0 | -254 | +/-50 |
| -3.0 | -12 | -2.8 | +/-1.0 | -11 | +/-6 |
| 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 |
| +3.0 | 11 | 2.8 | +/-0.5 | 10 | +/-3 |
| +30.0 | 284 | 28.9 | +/-3.0 | 274 | +/-50 |
| +60.0 | 850 | 58.2 | +/-6.0 | 826 | +/-130 |
| +90.0 | 1677 | 87.7 | +/-9.0 | 1634 | +/-250 |

| TEMPERATURE CHECK | | |
|---|---|---|
| Calibration Temperature | Instrument Temperature Channel Read | |
| Applied Equivalent Temperature (°C) | Temperature [Temp] ( °C ) | tol. ( °C ) |
| -10.0 | -10.0 | +/- 2.0 |
| 0.0 | 0.0 | +/- 1.0 |
| 30.0 | 30.0 | +/- 1.0 |
| 60.0 | 60.0 | +/- 1.0 |
| 100.0 | 100.0 | +/- 1.0 |

**Notes:**

The instrument identified by the serial number stated above has been tested by Gas Data personnel for calibration accuracy on the date and under the ambient conditions stated. Gas Data Ltd internal BS EN ISO9001:2008 compliant workshop procedures were followed to apply known calibration test gases, gas flow rates, pressures and temperatures of the values stated. The results displayed on the instrument at each stage are recorded above.

Gas Data Ltd is certified to BS EN ISO9001:2008. Certificate NQA 8374. Valid until 20/03/2016

| TEST DATE AND CONDITIONS | |
|---|---|
| Date | 24/4/17 |
| Atmospheric Pressure | 1002mB |
| Ambient Temp | 22.1°C |
| Environics Serial No. | 3268 |

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## GFM436-1 FINAL INSPECTION & CALIBRATION CHECK CERTIFICATE

| INSTRUMENT DETAILS | |
|---|---|
| Serial No | Customer |
| 12928 | Shawcity Ltd |

| INSTRUMENT CHECKS | | | |
|---|---|---|---|
| Keyboard | ✓ | Pump Flow | 500cc/min |
| Display Contrast | ✓ | Pump Flow @ -200mB | 300cc/min |
| Clock Set / Running | ✓ | S/W Version | G436-00.0027/0010 |
| Labels Fitted | ✓ | Recalibration Date | 24/4/18 |

| GAS CHECKS | | | | | | | |
|---|---|---|---|---|---|---|---|
| Calibration Gas | | Instrument Gas Channels Read | | | | | |
| Gas Type | Applied Conc. | CH4 ( % ) | tol. ( % vol. ) | CO2 ( % ) | tol. ( % vol. ) | O2 ( % ) | tol. ( % vol. ) |
| N2 | 100% | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | +/-0.1 |
| CH4 | 5% | 5.2 | +/-0.3 | 0.0 | 0.0 | 0.0 | +/-0.1 |
| | 60% | 59.8 | +/-3.0 | 0.0 | 0.0 | 0.0 | +/-0.1 |
| CO2 | 5% | 0.0 | 0.0 | 4.8 | +/-0.3 | 0.0 | +/-0.1 |
| | 40% | 0.0 | 0.0 | 40.2 | +/-3.0 | 0.0 | +/-0.1 |
| O2 | 20.9% | 0.0 | 0.0 | 0.0 | +0.1 | 20.9 | +/-0.5 |

| OPTIONAL GAS CHECKS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Calibration Gas | | Instrument Gas Channels Read | | | | | | |
| Gas Type | Applied Conc. | Label | H2S | CO | | | Hexane | tol. (% vol.) |
| | | Range | 5000ppm | 2000ppm | | | 2.00% | |
| N2 | 100% | | 0 | 0 | | | 0.0 | +/- 5.0 |
| H2S | 1500ppm | | 1520 | 0 | | | | +/- 5.0 |
| CO | 1000ppm | | 40 | 997 | | | | +/- 5.0 |
| Hexane | 2.00% | | | | | | 1.953 | +/- 10.0 |

| PRESSURE CHECKS | | | | | | | |
|---|---|---|---|---|---|---|---|
| Calibration Pressure | | Instrument Pressure Channels Read | | | | | |
| Pressure @ | Applied Pressure | Atmospheric [Ap] ( mB ) | tol. ( mB ) | | | | |
| All Ports | Current Atmospheric | 1002 | +/-2.0 | | | | |
| Ap Port (Internal) | +800mB(a) | 802 | +/-5.0 | | | | |
| | +1200mB(a) | 1198 | +/-5.0 | | | | |

| TEST DATE AND CONDITIONS | |
|---|---|
| Date | 25/4/17 |
| Atmospheric Pressure | 1001 mB |
| Ambient Temp | 20.6 °C |
| Environics Serial No. | 2633 |

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# GFM436-1 OUTWARD INSPECTION & QUALITY CHECK SHEET

| INSTRUMENT DETAILS | | | | | |
|---|---|---|---|---|---|
| SO Number | Instrument Banner | Instrument Serial Number + SW Version | Job Number(s) | | |
| 316930 | GFM436 | 12928/ 27-10 | 11646. | | |

**Calibration Technician** ..................................... **DATE** 24-4-17

**Inspection Technician** Biggs **DATE** 25/4/17

| INSTRUMENT CHECKS | | Pass (P). Fail (F) or not applicable(NA) |
|---|---|---|
| Function Tests | Dust Caps Fitted | P |
| | Keyboard Test (All keys) | P |
| | Backlight Test | P |
| | Clock Set / Running | P |
| | Comms Test | P |
| | Pump Flow Test (In & Out) | P |
| | Overall Leak Test (30mb) | N/A |
| | Battery Charge Test | P |
| | Service Date set to? | 24/4/18 |
| Channel Tests | Data Logging Enabled? | P |
| | Verify CH4/LEL/Hexane/PID | P |
| | Verify CO2 | P |
| | Verify O2 | P |
| | Verify H2S | P |
| | Verify CO | P |
| | Verify LEL | P |
| | Verify 1st Option gas | N/A |
| | Verify atmospheric pressure | P |
| | Verify differential pressure | P |
| | Verify flow | P |
| | Verify temperature probe input | P |
| | Verify vane anemometer input | P |
| DataBase Checks | Jobcard(s) completed and signed | P |
| | Jobcard(s) booked off database | P |
| | Calibration certificate completed | P |
| | Complete & print QI record | N/A |
| Label Checks | No. of Calibration label fitted | 7669 |
| | MCERTS label not displayed | P |
| | Warranty label fitted | N/A |
| H2S Range | H2S Range from SO | 5000ppm |
| | H2S Range from cal cert | 5000ppm |
| | Over-range value correct? | P |

| INSTRUMENT PACKING LIST | | Tick if included |
|---|---|---|
| Instrument | | ✓ |
| Leather Case | | ✓ |
| Instrument Strap | | ✓ |
| AC Battery Charger (UK) | | ✓ |
| AC Battery Charger (EURO) | | ✗ |
| AC Battery Charger (US) | | ✗ |
| AC Battery Charger (AUS) | | ✗ |
| Gas Sample Pipe | | ✓ |
| Hard Carry Case | | ✓ |
| Spares Pot | | ✓ |
| Allen Key | | ✓ |
| Flow Sample Pipe | | ✓ |
| Temperature Probe | | ✗ |
| Vane Anemometer | | ✗ |
| USB Cable | | ✓ |
| USB Memory Stick | | ✓ |
| SM V5 Software | Ver 6.05 | ✓ |
| Internal Filter Pack | Qty | ✗ |
| External Filter Pack | Qty | ✗ |
| Field Guide | | ✗ |

Extra Items:

Comments

| TEST DATE AND CONDITIONS | |
|---|---|
| Date | 24/4/17 |
| Atmospheric Pressure | 1002mB |
| Ambient Temp | 22.1°C |
| Environics Serial No. | 3268 |

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## GFM436-1 FINAL INSPECTION & CALIBRATION CHECK CERTIFICATE

### FLOW CHECKS

| Calibration Flow | | Instrument Flow Channels Read | | | |
|---|---|---|---|---|---|
| Applied Flow (l/hour) | Applied Pressure (Pa) | Flow [Flow] ( l/hour ) | tol. ( l/hour ) | Differential Pressure [Dp] ( Pa ) | tol. ( Pa ) |
| -30.0 | -359 | -30.1 | +/-3.0 | -364 | +/-50 |
| -3.0 | -15 | -3.1 | +/-1.0 | -17 | +/-6 |
| 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 |
| +3.0 | 14 | 3.0 | +/-0.5 | 14 | +/-3 |
| +30.0 | 349 | 30.2 | +/-3.0 | 367 | +/-50 |
| +60.0 | 1069 | 60.4 | +/-6.0 | 1073 | +/-130 |
| +90.0 | 2118 | 90.9 | +/-9.0 | 2174 | +/-250 |

### TEMPERATURE CHECK

| Calibration Temperature | Instrument Temperature Channel Read | |
|---|---|---|
| Applied Equivalent Temperature (°C) | Temperature [Temp] ( °C ) | tol. ( °C ) |
| -10.0 | -10.0 | +/- 2.0 |
| 0.0 | 0.0 | +/- 1.0 |
| 30.0 | 30.0 | +/- 1.0 |
| 60.0 | 60.0 | +/- 1.0 |
| 100.0 | 100.0 | +/- 1.0 |

**Notes:**

The instrument identified by the serial number stated above has been tested by Gas Data personnel for calibration accuracy on the date and under the ambient conditions stated. Gas Data Ltd internal BS EN ISO9001:2015 compliant workshop procedures were followed to apply known calibration test gases, gas flow rates, pressures and temperatures of the values stated. The results displayed on the instrument at each stage are recorded above.

Gas Data Ltd is certified to BS EN ISO9001:2015. Certificate NQA 8374. Valid until 22/03/2019

**Groundwater Monitoring**

Site: Wenlock Tower Complex, Gorton
Date: 20/04/2017
Weather: Dry and overcast

Job No.: 2913
Start time: 13:55
Recent weather: Showers

Engineer: JG & MB
End time: 14:45
Atm. Pressure: 1025

Borehole: BH06
Well Diameter: 0.05 m
Liquid Level: 1.70 m
Base Level: 8.90 m

Response zone (slotted): 2.00-9.50 m

| Time | NAPL Level | Water Level | pH | Electrical Conductivity | Total Dissolved Solids | Dissolved Oxygen | Redox Potential | Water Temp. | Sampled | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| | (m) | (m) | | (µS/cm) | (ppm) | (%) | (mV) | (°C) | (✓) | (Colour? Turbidity? Odour? Etc.) |
| 13:55 | n/a | 1.70 | | | | | | | | Start |
| 14:08 | - | 2.36 | 7.5 | 1166 | 583 | | -74 | 11.0 | | Brown, rusty and turbid. |
| 14:11 | - | 3.02 | 7.4 | 1232 | 616 | | -83 | 11.2 | | Brown and turbid. |
| 14:14 | - | 3.60 | 7.4 | 1250 | 623 | | -85 | 11.3 | | Brown and turbid. |
| 14:16 | - | 4.25 | 7.5 | 1251 | 6.25 | | -71 | 11.4 | | Brown and turbid. |
| 14:20 | - | 4.78 | 7.4 | 1250 | 626 | | -80 | 11.5 | | Brown and turbid. |
| 14:23 | - | 5.42 | 7.5 | 1251 | 624 | | -76 | 11.7 | | Brown, turbid and a slight hydrocarbon sheen. |
| 14:33 | - | 5.84 | 7.5 | 1252 | 626 | | -75 | 11.9 | | Brown and turbid. |
| 14:37 | - | 6.33 | | | | | | | ✓ | Brown and turbid. |
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**Comments:**

**Groundwater Monitoring**

| | | | | | |
|---|---|---|---|---|---|
| Site: | Wenlock Tower Complex, Gorton | Date: | 26/04/2017 | Weather: | Dry and cloudy |
| Job No.: | 2913 | Start time: | 11:40 | Recent weather: | Rain |
| Engineer: | JG & MB | End time: | 12:10 | Atm. Pressure: | 1010 |

Borehole: WS02A

Well Diameter: 0.05 m

Liquid Level: 1.72 m

Base Level: 2.55 m

Response zone (slotted): 1.00-3.00 m

| Time | NAPL Level | Water Level | pH | Electrical Conductivity | Total Dissolved Solids | Dissolved Oxygen | Redox Potential | Water Temp. | Sampled | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| | (m) | (m) | | (µS/cm) | (ppm) | (%) | (mV) | (°C) | (✓) | (Colour? Turbidity? Odour? Etc.) |
| 11:52 | n/a | 1.72 | 7.0 | 1320 | 656 | | 38 | 10.2 | | Mostly clear with black sediment |
| 11:54 | - | 1.90 | 7.0 | 1197 | 599 | | 25 | 10.1 | | Black and turbid |
| 11:56 | - | 1.91 | 7.0 | 1170 | 584 | | 3 | 10.1 | | Black and turbid |
| 11:58 | - | 1.96 | 7.0 | 1160 | 580 | | -1 | 10.0 | | Black and turbid |
| 12:00 | - | 2.00 | 7.1 | 1198 | 598 | | -11 | 10.0 | ✓ | Black and turbid |
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**Comments:**

**Groundwater Monitoring**

integra consulting

| | | | | | |
|---|---|---|---|---|---|
| Site: | Wenlock Tower Complex, Gorton | Date: | 20/04/2017 | Weather: | Dry and overcast |
| Job No.: | 2913 | Start time: | 15:01 | Recent weather: | Showers |
| Engineer: | JG & MB | End time: | 16:25 | Atm. Pressure: | 1025 |

Borehole: WS203
Well Diameter: 0.05 m
Liquid Level: 6.55 m
Base Level: 8.43 m

Response zone (slotted): 3.00-8.50 m

| Time | NAPL Level (m) | Water Level (m) | pH | Electrical Conductivity (µS/cm) | Total Dissolved Solids (ppm) | Dissolved Oxygen (%) | Redox Potential (mV) | Water Temp. (°C) | Sampled (✓) | Comments (Colour? Turbidity? Odour? Etc.) |
|---|---|---|---|---|---|---|---|---|---|---|
| 15:01 | n/a | 6.55 | 7.3 | 1489 | 744 | | 86 | 12.5 | | Orangish brown, rusty and turbid. |
| 15:05 | - | 7.60 | 7.3 | 1504 | 750 | | 88 | 12.4 | | Orangish brown, rusty and turbid. |
| 15:07 | - | 8.00 | 7.3 | 1486 | 743 | | 91 | 12.5 | | Orangish brown, rusty and turbid. |
| 15:17 | - | 8.26 | 7.4 | 1483 | 739 | | 95 | 12.5 | | Reddish brown and turbid. |
| 16:10 | - | 7.98 | | | | | | | ✓ | Reddish brown and turbid. |
| | | | | | | | | | | |
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**Comments:**

# APPENDIX 6

# REVISED CONCEPTUAL SITE MODEL DIAGRAM

Human Health Contamination Sources

1. Bulk made ground (Asbestos) - potential localised source.

Ground Gas Sources

None identified.

Controlled Waters Contamination Sources

2. Bulk made ground (Zinc) - widespread source.

Human Health Pathways

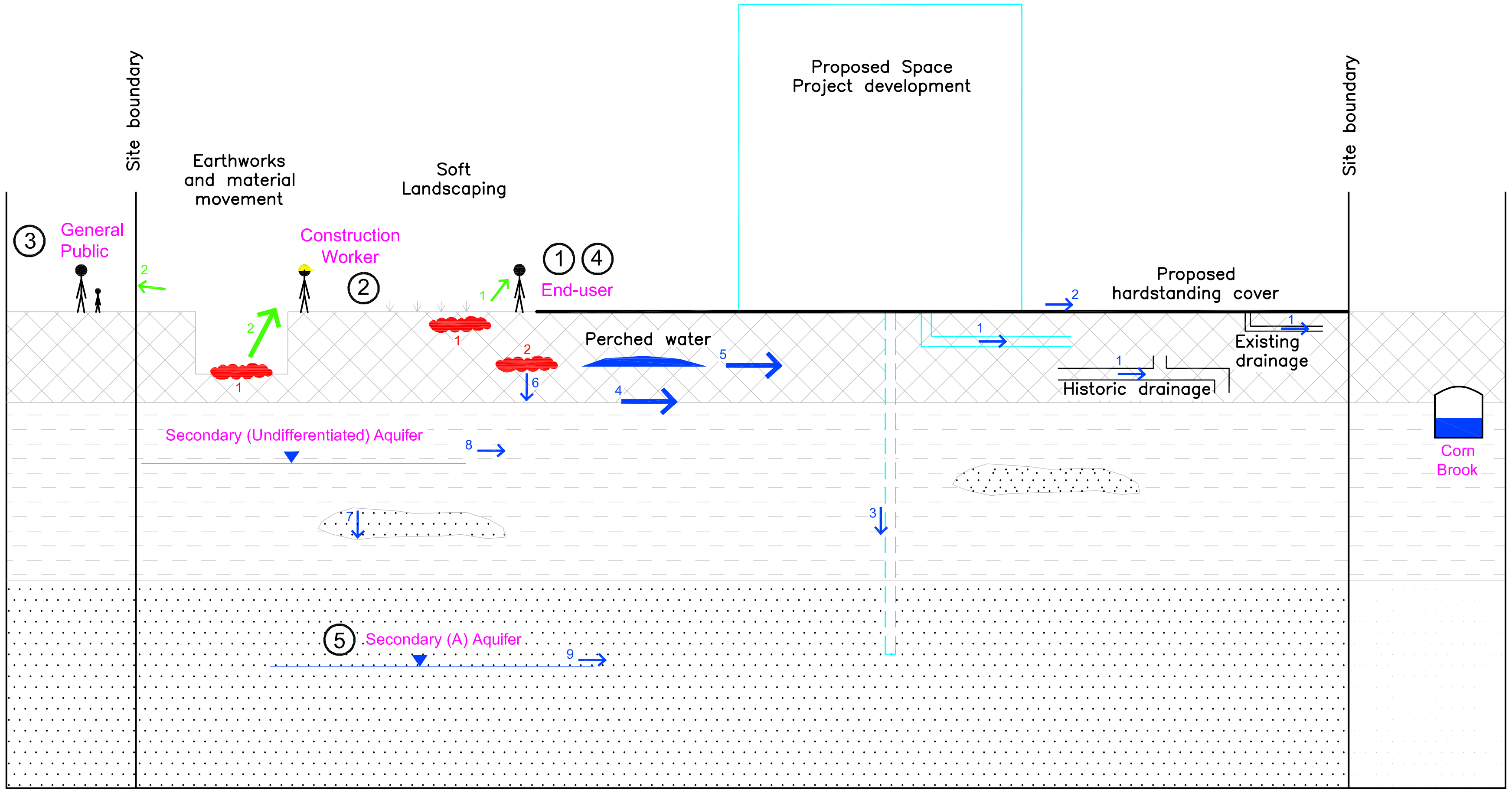
1. Inhalation from outdoor dust.
2. Inhalation risk during earthworks, demolition and material movement.

Controlled Waters Pathways

1. Lateral migration along historic / existing / proposed drainage.
2. Surface runoff.
3. Vertical migration along historic / existing / proposed foundations e.g. piles.
4. Lateral migration along low permeability deposits.
5. Lateral migration along perched water lenses / bands.
6. Vertical migration through granular made ground.
7. Vertical migration through granular lenses / bands within natural cohesive deposits.
8. Lateral migration along superficial groundwater flow.
9. Lateral migration along bedrock groundwater flow.

Receptors

1. End-users.
2. Construction workers.
3. General public.
4. Controlled waters (i.e. Secondary A and Secondary Undifferentiated Aquifer and Corn Brook).


Site boundary
Earthworks and material movement
Soft Landscaping
Proposed Space Project development
Site boundary
③
General Public
2
Construction Worker
②
2
1
1
①④
End-user
2
6
Perched water
5
4
2
Proposed hardstanding cover
1
1
Existing drainage
1
Historic drainage
Secondary (Undifferentiated) Aquifer
8
7
3
Corn Brook
⑤
Secondary (A) Aquifer
9

## RISK ASSESSMENT

① Human health risk is LOW due to limited contaminative sources and hardstanding negating pathway across the majority of the site.

② Human health risk from asbestos to construction worker is MODERATE due to acute interaction with soil - risk can be mitigated by the appropriate use of PPE and dust prevention measures.

③ Any human health risk to general public from airborne asbestos fibres during construction works will be mitigated by dust prevention measures.

④ Ground gas risk is VERY LOW due to absence of sources.

⑤ Controlled waters risk is VERY LOW to underlying aquifers and LOW to Corn Brook due to the low sensitivity of the receptor.

Notes.

1 All dimensions and levels are in metres unless noted otherwise.

2 This drawing is to be read in conjunction with all relevant Architects and Service Engineers drawings.

3 This drawing is abstract and not to scale.

4 The presence of any areas of soft landscaping / POS / landscaping features i.e trees are to be confirmed, if present human health pathway 1 will become more prevalent.

▨ Made Ground
▤ Glacial Till
⛆ Granular Lenses
▩ Bedrock – Sandstone / Mudstone

Pathway Significance

→ Low
→ High

| Rev | Drawn | Date | Description |
|---|---|---|---|

Drawing Status
INFORMATION

Contract
WENLOCK TOWER
COMPLEX,
SPACE PROJECT,
WEST GORTON

Drawing Title
REVISED
CONCEPTUAL SITE
MODEL DIAGRAM

**Integra**
**consulting**
**environmental**

Suite 4, 14-32 Hewitt Street, Manchester, M15 4GB
email: environmental@integraconsulting.co.uk
web: www.integraconsulting.co.uk
tel: 0161 237 9310

| | | | |
|---|---|---|---|
| Scales | N.T.S. | Date | MAY 2017 |
| Drawn | JG | Checked | MB |
| Contract No | 2913 | Drawing No | SI–07 P1 |

# APPENDIX 13

# IMPORTED 6F2 LABORATORY CHEMICAL TEST RESULTS

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

Concept Life Sciences is a trading name of Concept Life Sciences Analytical & Development Services Limited registered in England and Wales (No 2514788)

# Concept Life Sciences

## Certificate of Analysis

Hadfield House
Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

**Report Number:** 737938-1

**Date of Report:** 05-Jun-2018

**Customer:** PP O'Connor
Woodrow Way
Thames Trading Estate
Irlam
Manchester
M44 6NN

**Customer Contact:** Mr Nigel Hambleton

**Customer Job Reference:** C0150
**Customer Purchase Order:** C0150/24002
**Customer Site Reference:** Basell Carrington
**Date Job Received at Concept:** 18-May-2018
**Date Analysis Started:** 22-May-2018
**Date Analysis Completed:** 24-May-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS
TESTING
1549

Report checked
and authorised by :
Chloe Kitto
Customer Service Advisor

Issued by :
Jack Nagy
Customer Service Advisor

This document has been printed from a digitally signed master copy

**Concept Reference:** 737938
**Project Site:** Basell Carrington
**Customer Reference:** C0150

**Soil** **Analysed as Soil**
**Miscellaneous**

| | |
|---|---|
| **Concept Reference** | 737938 001 |
| **Customer Sample Reference** | ST 1 |
| **Date Sampled** | 17-MAY-2018 |

| Determinand | Method | Test Sample | LOD | Units | |
|---|---|---|---|---|---|
| Asbestos ID | T27 | A40 | | | N.D. |

**Concept Reference:** 737938
**Project Site:** Basell Carrington
**Customer Reference:** C0150

**Soil** **Analysed as Soil**
**Heavy Metals(9)**

| | |
|---|---|
| **Concept Reference** | 737938 001 |
| **Customer Sample Reference** | ST 1 |
| **Date Sampled** | 17-MAY-2018 |

| Determinand | Method | Test Sample | LOD | Units | |
|---|---|---|---|---|---|
| Arsenic | T6 | A40 | 1 | mg/kg | 6 |
| Cadmium | T6 | A40 | 1 | mg/kg | <1 |
| Chromium | T6 | A40 | 1 | mg/kg | 20 |
| Copper | T6 | A40 | 1 | mg/kg | 17 |
| Lead | T6 | A40 | 1 | mg/kg | 87 |
| Mercury | T6 | A40 | 1 | mg/kg | <1 |
| Nickel | T6 | A40 | 1 | mg/kg | 13 |
| Selenium | T6 | A40 | 3 | mg/kg | <3 |
| Zinc | T6 | A40 | 1 | mg/kg | 500 |

**Concept Reference:** 737938
**Project Site:** Basell Carrington
**Customer Reference:** C0150

**Soil** **Analysed as Soil**
**Total and Speciated USEPA16 PAH**

| | |
|---|---|
| **Concept Reference** | 737938 001 |
| **Customer Sample Reference** | ST 1 |
| **Date Sampled** | 17-MAY-2018 |

| Determinand | Method | Test Sample | LOD | Units | |
|---|---|---|---|---|---|
| Naphthalene | T16 | AR | 0.1 | mg/kg | <0.1 |
| Acenaphthylene | T16 | AR | 0.1 | mg/kg | <0.1 |
| Acenaphthene | T16 | AR | 0.1 | mg/kg | <0.1 |
| Fluorene | T16 | AR | 0.1 | mg/kg | <0.1 |
| Phenanthrene | T16 | AR | 0.1 | mg/kg | <0.1 |
| Anthracene | T16 | AR | 0.1 | mg/kg | <0.1 |
| Fluoranthene | T16 | AR | 0.1 | mg/kg | <0.1 |
| Pyrene | T16 | AR | 0.1 | mg/kg | <0.1 |
| Benzo(a)Anthracene | T16 | AR | 0.1 | mg/kg | <0.1 |
| Chrysene | T16 | AR | 0.1 | mg/kg | <0.1 |
| Benzo(b/k)Fluoranthene | T16 | AR | 0.1 | mg/kg | <0.1 |
| Benzo(a)Pyrene | T16 | AR | 0.1 | mg/kg | <0.1 |
| Indeno(123-cd)Pyrene | T16 | AR | 0.1 | mg/kg | <0.1 |
| Dibenzo(ah)Anthracene | T16 | AR | 0.1 | mg/kg | <0.1 |
| Benzo(ghi)Perylene | T16 | AR | 0.1 | mg/kg | <0.1 |
| PAH(total) | T16 | AR | 0.1 | mg/kg | <0.1 |

**Concept Reference:** 737938
**Project Site:** Basell Carrington
**Customer Reference:** C0150

**Soil** Analysed as Soil
**TPH (CWG) with MTBE, BTEX**

| | | | | Concept Reference | 737938 001 |
|---|---|---|---|---|---|
| | | | | Customer Sample Reference | ST 1 |
| | | | | Date Sampled | 17-MAY-2018 |
| **Determinand** | **Method** | **Test Sample** | **LOD** | **Units** | |
| Benzene | T54 | AR | 1 | µg/kg | (13) <1 |
| Toluene | T54 | AR | 1 | µg/kg | (13) 2 |
| EthylBenzene | T54 | AR | 1 | µg/kg | <1 |
| M/P Xylene | T54 | AR | 1 | µg/kg | <1 |
| O Xylene | T54 | AR | 1 | µg/kg | <1 |
| Methyl tert-Butyl Ether | T54 | AR | 1 | µg/kg | <1 |
| TPH (C5-C6 aliphatic) | T54 | AR | 0.010 | mg/kg | <0.010 |
| TPH (C6-C8 aliphatic) | T54 | AR | 0.010 | mg/kg | <0.010 |
| TPH (C8-C10 aliphatic) | T54 | AR | 0.010 | mg/kg | <0.010 |
| TPH (C10-C12 aliphatic) | T909 | AR | 1 | mg/kg | (13) <1 |
| TPH (C12-C16 aliphatic) | T909 | AR | 1 | mg/kg | (13) 7 |
| TPH (C16-C21 aliphatic) | T909 | AR | 1 | mg/kg | (13) 28 |
| TPH (C21-C35 aliphatic) | T909 | AR | 2 | mg/kg | (13) 250 |
| TPH (C6-C7 aromatic) | T54 | AR | 0.010 | mg/kg | <0.010 |
| TPH (C7-C8 aromatic) | T54 | AR | 0.010 | mg/kg | <0.010 |
| TPH (C8-C10 aromatic) | T54 | AR | 0.010 | mg/kg | <0.010 |
| TPH (C10-C12 aromatic) | T909 | AR | 2 | mg/kg | (13) <2 |
| TPH (C12-C16 aromatic) | T909 | AR | 1 | mg/kg | (13) 1 |
| TPH (C16-C21 aromatic) | T909 | AR | 1 | mg/kg | (13) 2 |
| TPH (C21-C35 aromatic) | T909 | AR | 1 | mg/kg | (13) <1 |

## Index to symbols used in 737938-1

| Value | Description |
|---|---|
| A40 | Assisted dried < 40C |
| AR | As Received |
| N.D. | Not Detected |
| 13 | Results have been blank corrected. |
| S | Analysis was subcontracted |
| U | Analysis is UKAS accredited |
| N | Analysis is not UKAS accredited |

## Notes

Asbestos testing was subcontracted to REC.

## Method Index

| Value | Description |
|---|---|
| T16 | GC/MS |
| T6 | ICP/OES |
| T54 | GC/MS (Headspace) |
| T27 | PLM |
| T909 | GCxGC |

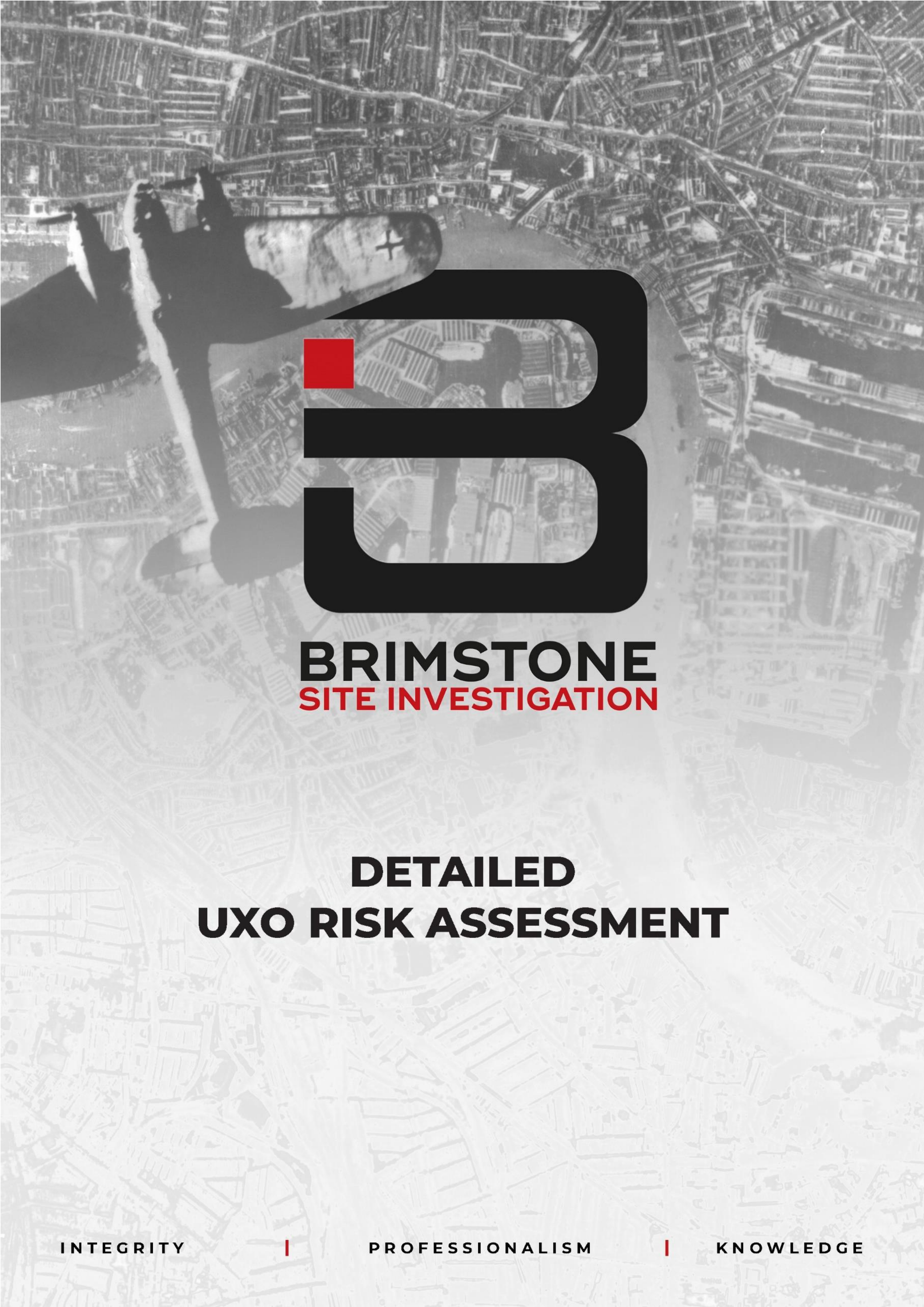
## Accreditation Summary

| Determinand | Method | Test Sample | LOD | Units | Symbol | Concept References |
|---|---|---|---|---|---|---|
| Arsenic | T6 | A40 | 1 | mg/kg | U | 001 |
| Cadmium | T6 | A40 | 1 | mg/kg | U | 001 |
| Chromium | T6 | A40 | 1 | mg/kg | U | 001 |
| Copper | T6 | A40 | 1 | mg/kg | U | 001 |
| Lead | T6 | A40 | 1 | mg/kg | U | 001 |
| Mercury | T6 | A40 | 1 | mg/kg | U | 001 |
| Nickel | T6 | A40 | 1 | mg/kg | U | 001 |

| Determinand | Method | Test Sample | LOD | Units | Symbol | Concept References |
|---|---|---|---|---|---|---|
| Selenium | T6 | A40 | 3 | mg/kg | U | 001 |
| Zinc | T6 | A40 | 1 | mg/kg | U | 001 |
| Benzene | T54 | AR | 1 | µg/kg | U | 001 |
| Toluene | T54 | AR | 1 | µg/kg | U | 001 |
| EthylBenzene | T54 | AR | 1 | µg/kg | U | 001 |
| M/P Xylene | T54 | AR | 1 | µg/kg | U | 001 |
| O Xylene | T54 | AR | 1 | µg/kg | U | 001 |
| Methyl tert-Butyl Ether | T54 | AR | 1 | µg/kg | U | 001 |
| TPH (C5-C6 aliphatic) | T54 | AR | 0.010 | mg/kg | N | 001 |
| TPH (C6-C8 aliphatic) | T54 | AR | 0.010 | mg/kg | N | 001 |
| TPH (C8-C10 aliphatic) | T54 | AR | 0.010 | mg/kg | N | 001 |
| TPH (C10-C12 aliphatic) | T909 | AR | 1 | mg/kg | U | 001 |
| TPH (C12-C16 aliphatic) | T909 | AR | 1 | mg/kg | U | 001 |
| TPH (C16-C21 aliphatic) | T909 | AR | 1 | mg/kg | U | 001 |
| TPH (C21-C35 aliphatic) | T909 | AR | 2 | mg/kg | U | 001 |
| TPH (C6-C7 aromatic) | T54 | AR | 0.010 | mg/kg | N | 001 |
| TPH (C7-C8 aromatic) | T54 | AR | 0.010 | mg/kg | N | 001 |
| TPH (C8-C10 aromatic) | T54 | AR | 0.010 | mg/kg | N | 001 |
| TPH (C10-C12 aromatic) | T909 | AR | 2 | mg/kg | U | 001 |
| TPH (C12-C16 aromatic) | T909 | AR | 1 | mg/kg | U | 001 |
| TPH (C16-C21 aromatic) | T909 | AR | 1 | mg/kg | U | 001 |
| TPH (C21-C35 aromatic) | T909 | AR | 1 | mg/kg | U | 001 |
| Asbestos ID | T27 | A40 |  |  | SU | 001 |
| Naphthalene | T16 | AR | 0.1 | mg/kg | U | 001 |
| Acenaphthylene | T16 | AR | 0.1 | mg/kg | U | 001 |
| Acenaphthene | T16 | AR | 0.1 | mg/kg | U | 001 |
| Fluorene | T16 | AR | 0.1 | mg/kg | U | 001 |
| Phenanthrene | T16 | AR | 0.1 | mg/kg | U | 001 |
| Anthracene | T16 | AR | 0.1 | mg/kg | U | 001 |
| Fluoranthene | T16 | AR | 0.1 | mg/kg | U | 001 |
| Pyrene | T16 | AR | 0.1 | mg/kg | U | 001 |
| Benzo(a)Anthracene | T16 | AR | 0.1 | mg/kg | U | 001 |
| Chrysene | T16 | AR | 0.1 | mg/kg | U | 001 |
| Benzo(b/k)Fluoranthene | T16 | AR | 0.1 | mg/kg | U | 001 |
| Benzo(a)Pyrene | T16 | AR | 0.1 | mg/kg | U | 001 |
| Indeno(123-cd)Pyrene | T16 | AR | 0.1 | mg/kg | U | 001 |
| Dibenzo(ah)Anthracene | T16 | AR | 0.1 | mg/kg | U | 001 |
| Benzo(ghi)Perylene | T16 | AR | 0.1 | mg/kg | U | 001 |
| PAH(total) | T16 | AR | 0.1 | mg/kg | U | 001 |

# APPENDIX 14

# DETAILED UNEXPLODED ORDNANCE RISK ASSESSMENT



BRIMSTONE
SITE INVESTIGATION

# DETAILED UXO RISK ASSESSMENT

INTEGRITY | PROFESSIONALISM | KNOWLEDGE

# STAGE 2 DETAILED UXO RISK ASSESSMENT

| | |
|---|---|
| **Client:** | IGE Consulting Ltd. |
| **Project Ref:** | IGE24R |
| **Site:** | Space Studios, Gorton |
| **Report Ref:** | DRA-21-1283-IGE24R-Space Studios, Gorton |
| **Revision:** | 0 |
| **Status:** | Final |
| **Release Date:** | 26th July 2021 |

| | | | |
|---|---|---|---|
| **Written By:** | Will Hunnisett | Project Researcher | will.hunnisett@brimstoneuxo.com |
| **Reviewed By:** | Chris Birch | Project Researcher | chris.birch@brimstoneuxo.com |
| **Authorised By:** | Aaron Florence | Managing Director | |

# EXECUTIVE SUMMARY

**RESULT:** Brimstone Site Investigation concludes that UXO poses a **LOW RISK** and **LOW-TO-MODERATE RISK** to the proposed works.

**THE SITE:** The Site (centred on the National Grid Ref: SJ 86792 96910) is located in Gorton, within Greater Manchester, approximately 180m south-west of Ashbury railway station. The Site is bound to the north by large commercial structures, to the east by open, undeveloped ground, to the south by Wenlock Way and to the west by Kniveton Road.

The Site comprises an area of brownfield land, with electric lighting present on Site. No further defining features are situated on Site.

**THE PROPOSED WORKS:** Development works will comprise the construction of a number of structures in the south of the Site. Car parking provisions will be located in the north. Pad foundations bearing into the firm / stiff clays at shallow level (<2.50m bgl) will be utilised, with the ground floor slab either being laid either on re-engineered made ground or improved ground (i.e. using vibro stone columns) to get the required bearing capacity.

**UXO RISK ASSESSMENT:**

**German UXO:**

- Greater Manchester was the 11th most heavily bombed British conurbation during WWII. Like today, the Site occupied a location on the periphery of the city centre during the Blitz, although confirmed Luftwaffe bombing targets were situated in the vicinity. However, it does not appear to have experienced a high bombing density, as only two raids are recorded to have affected the wider Site area.
- A bomb plot and damage map covering all air raids on the city was analysed, as was a map denoting civilian casualties as a result of bombing incidents. These confirm that the study area was affected by at least two air raids, resulting in 14 incendiary bombs within a 400m radius of the Site. No HE bombs were recorded in this radius. This map does not record sections of the wider Site area (which occupied part of the 300m radius to the south/south-east of the Site) and therefore multiple additional bombs may have occurred within the vicinity. However, unrecorded bombs in these areas would not pose a risk to the Site.
- As all bomb strikes in the wider Site area were incendiary bombs, it has not proved possible to identify individual bombload alignments in relation to the Site. While these bombs may not have been significantly affected by the wind and were dropped by a plane whose flightpath generally aligned with the Site, this cannot be ascertained for certain.
- Records of exploded and unexploded HE bombs dropped during the Manchester Blitz give a failure rate of 16.6%; a significantly higher figure than the widely accepted 10% average for Britain as a whole. However, as the Site does not appear to have been subject to significant damage, this factor is not thought to have an impact on this risk assessment.
- At the commencement of the Blitz, the Site was almost entirely occupied by terraced, residential structures in the west, with a small cluster of industrial/commercial structures in the east. Multiple roadways intersected the Site. A comparison of the historical records confirms that the vast majority of these structures survived the war intact with no significant damage sustained. Any UXB strike to these structures or the roadways would have caused incontrovertible evidence of its incidence.
- Furthermore, this apparent lack of bomb damage increases the likelihood that these structures were accessed on a frequent basis throughout WWII. This increases the likelihood that evidence of a UXB, within undamaged structures, would have been observed and reported at the time.

**British / Allied UXO:**

- Numerous (<30) permanent HAA batteries were active within range of the Site during WWII. Luftwaffe activity was frequent and intense over the wider area and therefore these guns would have expended a large quantity of ammunition. Consequently, it is quite possible that an unexploded AA shell struck the Site.
- A WWI-era chemical works was located approximately 150m north-east of the Site. This plant manufactured chemicals and TNT during WWI. However, as the majority of the Site comprised terraced structures, there is no associated risk of UXO contamination across most of the Site. There is a slightly elevated risk of UXO contamination in an area of seemingly insignificant ground in the east, although this risk is not considered significant enough to warrant proactive risk mitigation measures.

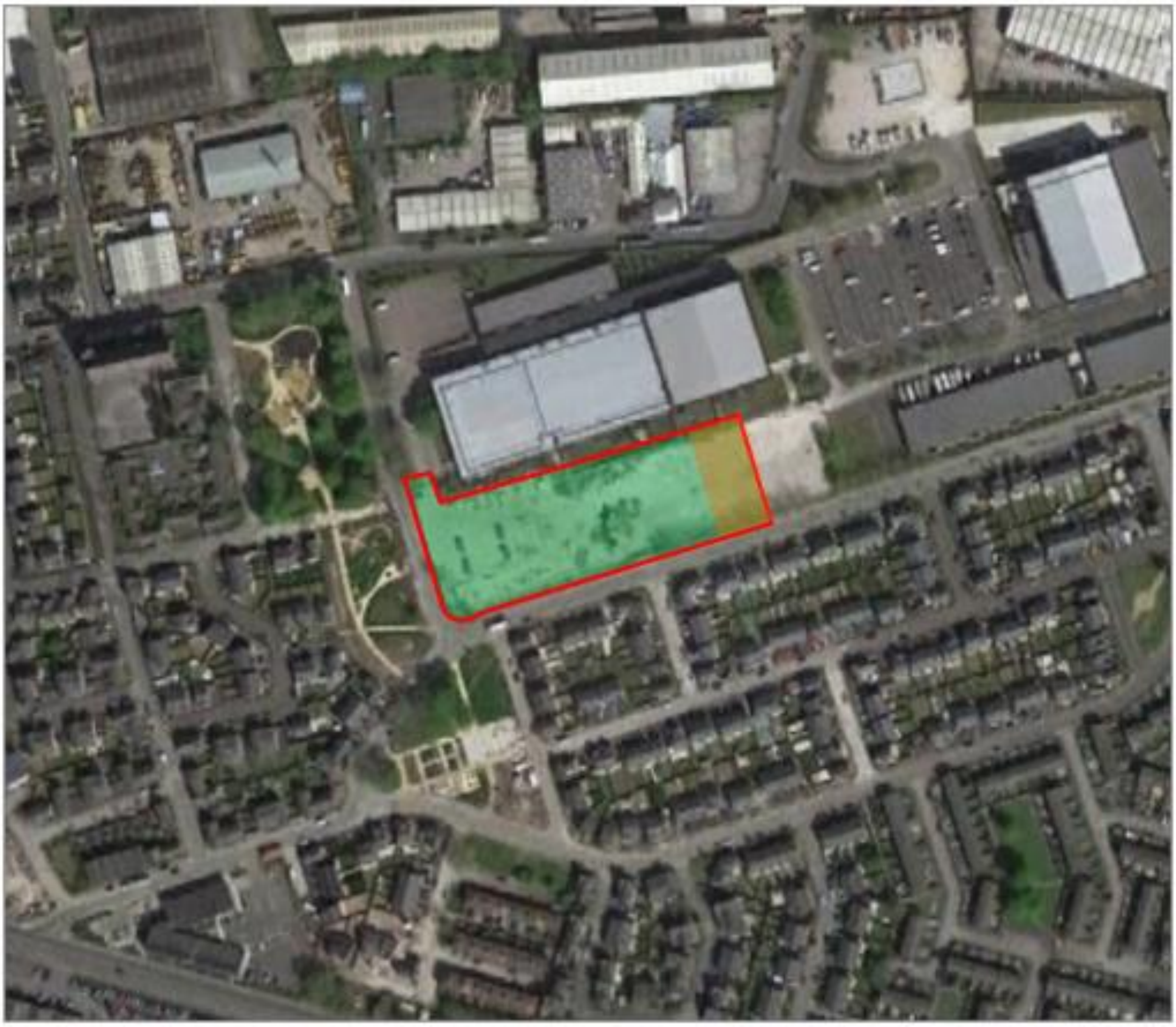
**Likelihood of UXO Remaining and UXO Encounter:**

- It is conceivable that some of the post-conflict ground works required deep excavations; contemporary, albeit poor quality aerial photography, appears to indicate that the structure built in the southern/central sections of the Site post-WWII was high rise. It is possible that structures built further east, since cleared, would also have required deep excavations. The grubbing out of foundations of pre-WWII structures would have disturbed soil down to the maximum depth of these foundations, the majority of which are thought to be shallow.
- The risk associated with any deep buried German UXBs will likely have been mitigated in the locations of possible deep excavations in the southern/central sections of the Site. The risk associated within any very shallow/shallow buried UXO will have been largely mitigated by the extensive groundworks that have occurred on Site with the clearing and subsequent grubbing out of foundations of the post-WWII structures

**RECOMMENDED RISK MITIGATION MEASURES:** The measures detailed below are recommended to mitigate the risk to ALARP level.

| Risk Mitigation Measure | Recommendation |
|---|---|
| UXO Safety Awareness Briefings | Prior to all intrusive works commencing within both risk zones. |

**RISK MAP:**



🟩 **LOW UXO RISK:** Low likelihood of German HE UXBs/IBs remaining here.

🟧 **LOW-MODERATE UXO RISK:** Slightly elevated likelihood of British LSA related ordnance remaining here.

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**APPENDIX 1:** Recent UXO Incidents and Historical Analysis

**APPENDIX 2:** Data Sheets - German WWII Air-Delivered Munitions

**APPENDIX 3:** Data Sheet - British WWII Anti-Aircraft Munitions

**APPENDIX 4:** Glossary

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# BRIMSTONE SITE INVESTIGATION LTD

Brimstone Site Investigation is committed to delivering bespoke UXO-risk mitigation strategies to a range of clients across a range of industries.

We are committed to providing a safe, cost-effective, and quality service, underpinned by our three core values:

- **Integrity** in advice, information and the manner in which we conduct ourselves and our operations.
- **Professionalism** in the way we handle our operations, people, and processes.
- **Knowledge** in new skills and information, to ensure we remain at the forefront of innovation and strategy.

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This report has been prepared with consideration to the site conditions at the time of report order confirmation. BSI Ltd cannot accept liability for any subsequent changes to the conditions on site which may influence the UXO risk. The report has been prepared in line with the relevant CIRIA guidance and UK legislation current at the time of report order confirmation. Changes to official guidance, legislation or technical risk assessment improvements could render parts of this assessment obsolete.

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# 1 INTRODUCTION

## 1.1 Background

IGE Consulting Ltd. (the Client) has commissioned BSI to carry out a Stage 2 Detailed Unexploded Ordnance Risk Assessment (DRA) of the proposed redevelopment works at the Space Studios, Gorton site (the Site).

## 1.2 Legislation

There are no regulations that specifically govern the UXO risk mitigation industry in the UK. There are however two pieces of legislation that require consideration. It is industry best practice (and common sense) to frame your site in the context of UXO, and to put in place measures to protect people from risks. In 2009, CIRIA published Unexploded Ordnance (UXO) - A Guide for the Construction Industry C681. This publication, though not legally binding, provides the gold-standard framework to which UXO and construction companies operate.

### 1.2.1 Construction Design and Management Regulations (CDM) 2015

The regulations identify the client, the CDM coordinator, the designer, and the principal contractor as responsible parties. Under the regulations, responsible parties are held accountable for the way a construction project is managed and for the health and safety of workers. Responsible parties must:

- Provide an appropriate assessment of potential UXO risks, or ensure an assessment is completed by another party.
- Put in place appropriate risk mitigation measures if necessary.
- Supply all parties with information relevant to the risks.
- Ensure the preparation of an emergency response plan.

### 1.2.2 The Health and Safety at Work Act 1974

The Health and Safety at Work Act 1974 had a transformative impact on health and safety, saving thousands of lives since its enactment. Employers must consider their employees, workers not in their employment, and members of the public. The act places a duty on every employer ‘as far as is reasonably practicable’ to protect workers from risks. It also says that information must be provided about aspects of health and safety that affect their role.

## 1.3 Commercial Contractor and the Authorities

### 1.3.1 Commercial Contractors

If your site has been given a moderate or high-risk rating, then control measures will be recommended. The measures will be specific to the scope of works on site, usually in relation to the depth and extent of excavations, piling and similar activities. There are a range of different methods at BSI’s disposal, including:

- Non-intrusive surveying (including drone surveying)
- Intrusive surveying
- Search and clear
- Watching brief
- Support to geotechnical investigations
- Target investigation
- Site-specific training packages
- Site safety briefings

Our UXO Engineers can assess suspicious items on site when they are found. This will avoid unnecessary site evacuations. If our engineer(s) decide the item is UXO, they will coordinate with the authorities, manage disruptions, and advise on control measures, such as evacuations and a cordon.

### 1.3.2 UK Authorities

If BSI is not on site and a suspicious item is found, the local police must be immediately called on the non-emergency number. Police will visit the site. They will then inform the Joint Services Explosive Ordnance Disposal (JSEOD) office, which will coordinate the callout of an army or navy response team.

A precautionary cordon will initially be put into effect, with possible evacuation of homes and businesses, road and rail closures. The cordon may be extended following the advice from JSEOD's response team.

To manage their resources, JSEOD triages incidents. A consideration of the type, size and location of the UXO is made. If an incident is not given a high priority rating, a team may not be available for up to two days following the initial report.

The use of JSEOD is under the Military Aid to Civil Authorities (MACA) framework, therefore the budget and personnel is limited, and there are no statutory obligations made of the MOD. Often the MOD will recommend involvement of a commercial UXO contractor to manage the ongoing risk – this is especially true of former airfields and training areas where contact with land service ammunition can be frequent.

## 1.4 UXO Risk in the UK

Fortunately, to the best of our knowledge, there has not been a single post-war incident in the UK where a construction worker has been killed or injured because of an item of UXO exploding. There have been cases in mainland Europe where UXO had been struck and then exploded, killing workers. In 2019 a WWII general purpose bomb spontaneously detonating in a field north of Frankfurt, Germany.

However, the incident in Frankfurt is not comparable to the UK, due to the way different countries manufactured ordnance. Bombs made in different countries have different associated hazards. British WWII bombs, for example, have a fuzing system which uses chemicals which makes them very unsafe. Please see **APPENDIX 1** for recent examples of UK UXO incidents.

Between 2013 and 2016 JSEOD responded to 7,500 callouts. These callouts range from falsely identified objects, inert objects, small items of UXO and large WWII German unexploded bombs (UXBs). Each year the construction industry inadvertently unearths UXO; often this goes unreported. UXO contamination comes from three main sources:

- **Enemy action:** during WWI and WWII the air forces of Germany, and to a lesser extent Italy, bombed targets throughout the UK. The German navy bombarded several coastal targets in eastern England during WWI and then in WWII German long-range artillery on the French coast bombarded parts of Kent.
- **Allied military activity:** during WWI and WWII several Allied nations used the UK as a staging area for military action in the European Theatre; predominantly the US and Canada.
- **UK military activity:** domestic British Army, Royal Air Force (RAF) and Royal Navy (RN) training activities during peacetime and conflict as well as anti-aircraft gun and rocket batteries during WWI and WWII.

## 1.5 UXO Detonations

A detonation is a violent chemical reaction which creates a huge volume of gas. This reaction appears to happen instantaneously – the velocity of the shockwave moving is up to 9000m per second. This chemical reaction is started using a small amount of very sensitive explosives called primary explosives. These types of explosives are highly sensitive to shock, friction, heat, and spark. As the explosive charge undergoes high order decomposition (detonation), the brisance, or shattering effect, causes the casing to splinter, projecting razor-sharp shrapnel across long distances.

The blast wave effect and the shrapnel effect can cause significant damage. Calculating safety distances is a complex process. As a rule of thumb, in open ground, a 250kg explosive charge (as would be found inside a typical 500kg bomb) would require an omnidirectional safety distance of at least 1.6km.

Bombs work by amplifying the explosive charge from the sensitive primary explosive through to the main charge or fill of the item. This process is called an explosive train, if any link in that chain is broken, the item will fail to function as intended. This can be due to mechanical, electrical, or manufacturing tolerances or faults. Amongst other reasons, detonation of UXO could occur under the following circumstances:

- **UXO body impact:** A substantial impact onto the main body of a UXO; borehole rigs, piling rigs, jack hammers and mechanical excavator buckets.
- **Fuse impact:** Environmental conditions during decades of burial can result in the primary explosives located in the fuse pocket to crystallise and become shock sensitive. It would then take a relatively small impact or friction impact to cause the fuse to function and detonate the UXO.
- **Re-starting a timer:** A small proportion of German WWII bombs used clockwork fuses. In 2002 an Army EOD Engineer reported that the clockwork fuse in a UXB re-started. Decades of burial cause substantial corrosion in WWII German UXBs and therefore an incident such as this is extremely rare.

# 2 ASSESSMENT METHODOLOGY

## 2.1 Introduction

This assessment has been produced in accordance with the relevant CIRIA guidelines; *Unexploded Ordnance (UXO) - A Guide for the Construction Industry C681* (published in 2009). CIRIA C681 is a publication which originated from round table best practice discussions from industry leaders.

## 2.2 SPRC Risk Model

The Source, Pathway, Receptor, Consequence (SPRC) risk model can be applied to buried UXO as follows:

- **Sources:** UK and allied UXO sources include military firing ranges, bases, storage depots, munitions factories, anti-aircraft batteries, amongst others. There are many wartime causes of UXO contamination. The source for enemy contamination is overwhelmingly from WWII German air raids.
- **Pathways:** the pathway describes how the UXO reaches receptors. Usually UXO is buried and therefore pathways can be any activity which involve breaking ground. Examples include ground investigation works, site enabling works and excavations.
- **Receptors:** receptors are the people, assets and infrastructure that can be adversely affected by UXO exposure. This includes site personnel, plant, equipment, buildings, the general public, , and the environment.
- **Consequence:** the consequences of an inadvertent UXO detonation are catastrophic. They include injury and loss or life, as well as damage to property. Fortunately, the likelihood of UXO detonating is low, even when it is uncovered during works. Another consequence to consider however is delays to works, which itself can be a risk.

## 2.3 Assessment Structure

In accordance with CIRIA C681 this assessment addresses the following considerations in the appropriate order:

- The likelihood that the site was contaminated with UXO.
- The type of UXO that could have contaminated the site, and their associated hazards.
- The likelihood that UXO remains on the site.
- Theoretical bomb penetration depths.
- The likelihood that UXO will be uncovered during the proposed works.
- Risk rating and risk mapping (as appropriate).
- Risk mitigation recommendations.

## 2.4 Information Sources

To complete this risk assessment BSI has gathered information from a wide range of sources. BSI's research team has completed detailed historical research, including access of original archived records. The following is a general list of information sources that are consulted during the research process:

- The National Archives,
- Local archive centres,
- Ministry of Defence,
- The Council for British Archaeology,
- Groundsure mapping services,
- Historical aerial photography (Historic England, Britain From Above, Bluesky),
- Google open source mapping,
- The British Geological Society,
- Open sources; published book, articles, web resources,
- Site specific information supplied by the Client,
- BSI's library and historical database, and
- BSI's former armed forces employees.

## 2.5 ALARP Principle

The ALARP (as low as reasonably practicable) principle corresponds to the actions that should be taken to reduce risks. The term 'ALARP' is in the Health and Safety at Work Act 1974, which says that risks must be controlled in a reasonable way.

Infinite time, effort and money could be spent trying to eliminate risk entirely. HSE uses the example that spending £1m to prevent five employees bruising their knees is disproportionate, whereas spending the same amount to prevent an explosion which could kill 150 people is proportionate.

Using this principle, BSI aims to reduce client costs by recommending strategies that are proportionate to the assessed risks, if any elevated risk is found at all.

## 2.6 Risk Tolerances

The BSI risk assessment process divides UXO risk into two tolerances:

- **Tolerable:** negligible risk or low risk ratings are tolerable. Where the risk cannot be completely discounted, it may be a useful strategy to opt for a low-cost measure, such as a UXO safety briefing from a qualified UXO engineer.
- **Intolerable:** moderate risk or high-risk ratings are intolerable. Proactive risk mitigation measures should be put in place. Various strategies are at BSI's disposal to meet your project-specific needs.

## 2.7 Reliance and Limitations

This report has been prepared using published information and information provided by the Client. BSI is not liable for any information which has become available following the publication of this report. No third-party liability or duty of care is extended. Any third-party using information contained in this assessment do so at their own risk.

# 3 THE PROJECT

## 3.1 The Site

The Site (centred on the National Grid Ref: SJ 86792 96910) is located in Gorton, within Greater Manchester, approximately 180m south-west of Ashbury railway station. The Site is bound to the north by large commercial structures, to the east by open, undeveloped ground, to the south by Wenlock Way and to the west by Kniveton Road.

The Site comprises an area of brownfield land, with electric lighting present on Site. No further defining features are situated on Site.

**FIGURE 1:** Site Location Maps **FIGURE 2:** Recent Aerial Photograph

## 3.2 The Proposed Works

Development works will comprise the construction of a number of structures in the south of the Site. Car parking provisions will be located in the north. Pad foundations bearing into the firm / stiff clays at shallow level (<2.50m bgl) will be utilised, with the ground floor slab either being laid either on re-engineered made ground or improved ground (i.e. using vibro stone columns) to get the required bearing capacity.

**FIGURE 3:** Existing Site Plan

# 4 SITE HISTORY

## 4.1 Site Introduction

Site-specific history can be assessed by reviewing historical mapping, historical aerial photography and by carrying out additional Site-specific research where appropriate. Below are descriptions of a selection of records relevant to the Site:

## 4.2 Mapping

| Period | Map Date | Map Scale | Review |
|---|---|---|---|
| Pre-WWI | 1893 | 1:2,500 | The Site comprises terraced residential structures on Edgeley Street, Eskridge Street and Kelsall Street.<br>The eastern section of the Site comprises unnamed structures of an assumed industrial/commercial structure. |
| | 1908 | 1:2,500 | No significant changes on Site.<br>A row of structures have been erected to the north of the terraced, residential structures. |
| Post-WWI | 1922 | 1:2,500 | **FIGURE 4.1:** The structure in the north-east of the Site has been extended to the north. |
| Post-WWII | 1948-1950 | 1:1,250 | **FIGURE 4.2:** One small structure has been cleared in the centre of the Site.<br>No further alterations on or adjacent to the Site. |
| | 1953-1979 | 1:1,250 | Large clusters of structures on Nellie Street, Eskridge Street, Edgeley Street, Kelsall Street and Thomas Street (all on Site) have been cleared. |
| | 1975-1990 | 1:1,250 | All pre-WWII structures on Site have been cleared.<br>A large structure, of an assumed commercial/industrial nature, is encompassed by the Site. |

## 4.3 Photography/Aerial Photography

| Period | Photo Date | Review |
|---|---|---|
| **Post-WWII** | **May 1947** | **FIGURE 5:** This oblique view photograph was taken approximately two years after the end of WWII in Europe.<br>Whilst the poor quality of the image means that detailed analysis is limited, it can be said that the majority of the Site appears to comprise undamaged, terraced structures. The structures in the east of the Site also appear to be undamaged.<br>There do not appear to be any structures immediately adjacent to the Site which have been damaged/cleared. |

## 4.4 Additional Site-Specific History

Some sites will have been occupied by landmarks or significant buildings historically and in such cases specific written histories including significant wartime details are occasionally available in the public domain. No such information was available.

# 5 UXO RISK - GERMAN BOMBING

## 5.1 WWII Bombing History of the Site

### 5.1.1 Greater Manchester

Greater Manchester was home to a number of vital wartime industries during WWII, many of which were located in Trafford Park. Infrastructure of strategic importance was also present in the form of Manchester Docks and the Manchester Ship Canal.

Between 29th July 1940 and 30th July 1942, Greater Manchester experienced 41 air raids, most of which were small in scale, often executed by a solitary bomber. At least nine relatively insignificant raids were carried out during the autumn of 1940, with the first medium scale raid affecting a wide area, occurring on 28th August. Then on 1st October, a medium to heavy raid was executed.

The Luftwaffe mounted consecutive major attacks on the nights of 22nd/23rd and 23rd/24th December 1940 (the 'Christmas Blitz'). These left large areas of Manchester, Salford and Stretford devastated. NB: a major attack was a Luftwaffe designation for a raid delivering >100 tonnes of HE (in addition to incendiaries) to a target area.

In total these two attacks involved 441 German bombers dropping 272 tonnes of HE on the first night and 195 tonnes of HE on the second night. Seven conflagrations and 600 smaller fires were reported, the result of tens of thousands of small incendiary bombs (IBs). The Christmas Blitz caused the total destruction of >4,000 houses as well as serious damage to a further 12,000. 805 HE bombs were reported across Manchester, Salford, Stretford, and Manchester Docks, including 134 UXBs.

During 1941, two additional major* raids was launched on the 9th January and 1st June. Although each involved half as many aircraft as 22nd December 1940 raid, they still delivered a further 208 tonnes of HE bombs and numerous IBs onto the city and surrounding area. Three medium scale raids were also mounted in 1941, during the spring.

*The fourth and final major raid actually only delivered 97 tonnes of HE, however, is close enough to 100 tonnes to be considered 'major'.

### 5.1.2 Site Specific

In addition to Salford Docks and the heavy industry located in Trafford Park, Manchester city centre was part of the Luftwaffe's primary aiming point for raids on the wider conurbation. However, as the Site was located on the periphery of the historic city centre, there were not a multitude of identified targets within the immediate vicinity. Original Luftwaffe target maps of Manchester highlight Crossley Gas and Oil Works, approximately 600m north-east, as the closest primary target. Additionally, the industry immediately east of the Site may also have provided a target of opportunity to Luftwaffe bombers.

### 5.1.3 Bombing Decoy Sites

In mid-1940 bombing decoys were introduced. The decoys used either;

- A system of lighting to simulate an urban area or a military airfield's runway
- Deliberately started fires to simulate a previously bombed target
- Dummy buildings and vehicles to simulate a military facility

792 static decoy sites were built at 593 locations in Britain. They were estimated to have drawn at least 5% of the total weight of bombs away from their intended targets. No decoys were operational within a significant radius of the Site during WWII. The closest was approximately 5.3km to the south-east.

## 5.2 WWII Bombing Records

### 5.2.1 Introduction

The bomb census recorded the location and type of bomb strikes to help with intelligence gathering and planning. It was compiled using information recorded by ARP wardens. These records were gathered by the Ministry of Home Security to calculate bombing density within administrative areas.

The bomb census was unreliable in the early stages of the war, though by 1941 procedures had been standardised. The quality of the census records also depended on where in the UK the records were produced. Some records are held at the National Archives and some are held at local borough archives.

Relevant records held at the National Archives and Manchester Library were obtained for this risk assessment.

### 5.2.2 Bombing Density Statistics

The table below records the Ministry of Home Security's bombing density calculation for the County Borough of Manchester. It gives a breakdown of the types of large German bombs reported and is understood to not include UXBs.

| Admin Area | Manchester |
|---|---|
| Area Acreage | 27,255 |
| High Explosive Bombs (all types/weights) | 712 |
| High Explosive Parachute Mines | 18 |
| Flam (Oil) Bombs | 7 |
| 40kg Phosphorus Incendiary Bombs (IBs) | 0 |
| 40kg 'Fire Pot' IBs | 0 |
| V1 Flying Bomb | 1 |
| V2 Long Range Rocket | 0 |
| Total (excluding V-Weapons and 1kg / 2kg IBs) | 737 |
| **Bombs Per 1,000 Acres** | **27.1** |

This overall bombing density figure is not high, however, this is because the vast majority of the county borough was located far from the central bombing target area. The Luftwaffe's aiming points were positioned at the boundaries of Manchester County Borough, Salford County Borough and Stretford Municipal Borough. Consequently, the weight of the Luftwaffe raids was divided between the bombing figures for these three areas, unlike in most other Blitzed cities.

NB: 1kg / 2kg incendiary bombs (IB) and 2kg anti-personnel (AP) bombs were often too numerous to record accurately and therefore are usually not included. Additional information (Cooper. G, 2018) states that during the first major air raid alone (22nd December 1940) some 37,000 small IBs were dropped on Manchester.

### 5.2.3 Manchester Bomb Plot and Damage Map: 140-1941

BSI has reviewed an original bomb plot and damage map for the wider study area. This map was produced by Manchester City Council' Architect's Department (Building Surveyor's Division) during the war and was updated throughout the conflict to reflect all raids on the city.

No original legend / key accompanies this map. However, a contemporary description does confirm some symbols. No symbol for UXBs was identified and any IB strike symbol with a number written within it represents the number of individual IBs falling at that location. Three categories of damage are illustrated on this map: solid red, hatched red and red outline. These are likely to represent 'total destruction or severe damage', 'moderate damage' and 'minor blast damage' respectively.

A small section of the map covering the study area is presented at **FIGURE 6** and described below.

- No bomb strikes are recorded on or adjacent to the Site. The nearest incendiary bomb strike is located approximately 160m south-west. No HE bombs were recorded in the wider Site area.
- Fifteen incendiary bombs are plotted within a 400m radius of the Site.
- The wider Site area was bombed on at least two occasions.
- A demolished building is recorded approximately 450m north-east. NB: As the Site is located across multiple mapping sheets, some of the wider Site area is not covered. It is conceivable that further bombing incidents, unrecorded, occurred within these undocumented areas. However, as these areas are not in the immediate vicinity of the Site, this is not considered to affect the validity of the findings of this report.

### 5.2.4 Manchester Civilian Fatalities Map

A contemporary digital map of Greater Manchester recording the locations of every Christmas Blitz (22nd-24th December 1940) bombing incident that resulted in at least one fatality was reviewed. This map (recently published by the Manchester Evening News) was compiled using data from the Commonwealth War Graves Commission. However, it only covers the two heaviest air raids on the city.

Although a potentially significant indirect source of bombing incident locations, many bombs did not cause a fatality and therefore this map should not be viewed as a complete record of bombing incident locations.

No fatalities were recorded at or adjacent to the Site. The nearest plotted incident is described as '16 Royal Street, 3 fatalities' (approximately 590m north-west of the Site). NB: this exact location does not correspond to a bomb symbol or any damage on the consolidated bomb plot / damage map.

### 5.2.5 Abandoned Bomb Register

Due to the overstretched bomb disposal units during WW2, many bombs were intentionally left undisturbed. UXBs were triaged based on where they were and how big they were. If they didn't pose a significant risk, they were 'abandoned'. The locations of these bombs were recorded on the abandoned bomb register.

The abandoned bomb register is a public record document held at the Parliamentary Archives of the House of Commons, from which BSI has obtained a copy. The register should not be relied on for completeness or accuracy. The closest abandoned bomb is recorded approximately 5.8km west of the Site.

### 5.2.6 Secondary Source / Anecdotal Evidence

A search of online resources, as well as a review of local history publications was carried out with the intention of locating any eyewitness accounts of local bombing incidents. While reference to the bombing of industrial facilities within Gorton was no found, no reference to the Site was present in the secondary sources consulted for this report.

## 5.3 Likelihood of UXB Contamination

Where detailed bombing records exist, it is possible to predict whether any UXBs could be found on a site. This likelihood is discussed in the following table:

| **Density of Bombing** | |
|---|---|
| Number of Air Raids in the Vicinity: | A comparison of the bombing incident records confirms that at least two air raids affected the study area. NB: this number is almost certainly higher, as the bomb mapping only records raids from 1940-1941. |
| Intensity of these Air Raids: | All bombs dropped locally were likely part of large-scale indiscriminate carpet-bombing raids, all of which were carried out at night. |
| **Bomb Strike Positions** | |
| Closest Bomb Strikes | HE bombs: None in the wider Site area.<br>1kg / 2kg IBs: 160m west. |
| Alignment of recorded Bomb Strikes: | One possible IB stick to the west of the Site has been identified. These bombs fell on the 22/12/40. This potential bomb stick doesn't straddle the Site, however, small IBs were dispersed from containers at a predetermined height, with the sub-munitions then spreading out over a wide area. As such, the locations of individual IB strikes at ground level does not give an indication of the aircraft's flightpath. This is in stark contrast to HE bombloads, which usually form linear bomb-sticks. |
| **Bomb Failure Rate** | |
| Evidence to suggest that the generally accepted failure rate of 10% differs in the vicinity of the site: | Records of exploded and unexploded HE bombs dropped on Manchester, Salford and Stretford during the Christmas Blitz give a failure rate of 16.6% (Smith. P, J, C, 2003). This is higher than the national average. |
| UXBs recorded in close proximity to the site: | None recorded in the wider Site area. |

## 5.4 Likelihood of Subsequent UXB Detection

A range of circumstances determine whether a UXB strike location would have been identified, during and after the war. This is discussed in the following table.

| **Historic Access** |
|---|
| A UXB falling on a site which was frequently accessed would have had a better chance of being found. ARP Wardens actively searched for UXBs in heavily bombed residential areas. The importance of a site or nearby buildings and infrastructure was also a factor. Many industrial facilities had fire watchers tasked with extinguishing incendiary bombs and reporting UXBs. |
| The structures and roadways on Site were likely frequently accessed throughout WWII by residents/employees. This anticipated frequent access reduces the likelihood of local air raids occurring unobserved. Any UXBs dropped on Site would have been witnessed and subsequently investigated. This likely frequent degree of access is considered to mitigate the risk posed by the insignificant nature of the Site.<br>It is conceivable that the area of open ground in the east with no apparent use may have been less frequently accessed than the houses and roadways. However, it is thought that this area would have been subject to at least a degree of access, owing to its proximity to the industrial/commercial structures. |

| Bomb Damage |
|---|
| As the bombing campaign continued, damaged areas became vulnerable to unreported UXBs. Bombsite wreckage or soil disturbance at a bomb crater could obscure evidence of a subsequent UXB strike. |
| No evidence has been found to suggest that the structures on Site sustained bomb damage. Circa 1947 aerial photography and post-WWII OS mapping indicate that the vast majority of structures on Site remained externally intact. While one small structure in the east was cleared post-WWII, no evidence has been found to suggest that this was a result of bombing. Furthermore, no evidence of HE bomb cratering within the hardstanding on Site. |

| Ground Cover Type |
|---|
| A UXB which falls on open field could easily go unnoticed, whereas a UXB dropped on a hard-surfaced car park would have been easily observed. |
| Any UXB strike to the structures on Site would have caused incontrovertible evidence of its incidence as it passed the structures and into the ground beneath. The same can be said for the roadways on Site, where (assuming no cratering) a HE UXB entry hole would have been persistent and easily recognisable. |

## 5.5 Bombing During WWI

During WWI, an estimated 9,000 German bombs were dropped on London, Eastern England and South-Eastern England during some 51 Zeppelin airship raids and 52 fixed-wing aircraft raids. London suffered the worst of the bombing with an estimated 250 tonnes of HE and incendiary bombs recorded across the Capital, over half of which fell on the City of London district.

The WWI bombing campaign waged by Germany was on a far smaller scale than the WWII campaign, in terms of the number of raids, the weight of ordnance dropped during each attack and the size of the bombs used. When coupled with the fact that most WWI bombed locations have since been redeveloped, German WWI UXB finds are extremely rare. Furthermore, most air raids took place during daylight hours and as it was the first time Britain had experienced strategic aerial bombardment, the raids often attracted public interest and even spectators, increasing the chances of any UXBs being reported. However, no raids affected Gorton during WWI, and the risk from associated ordnance can be discounted.

# 6 WWII GERMAN BOMBS

## 6.1 Bombs Dropped on the UK

Nazi Germany used different types of ordnance against the UK for different effects. Some types were designed to cause fires, others for their destructive blast effect and other for their penetration capability. Each type of ordnance was fitted with at least one fuze. For some bombs multiple fuzes were used. Many different types of fuzes were available for use – each with its own set of associated hazards.

Data sheets on those bombs most likely to be encountered today are included at **APPENDIX 2**.

- **HE bombs – moderate NEQ (net explosive quantity):** the most common types of HE bombs dropped were the SC (general purpose - GP) and SD (semi-armour piercing - SAP) series of bombs. The NEQ is between 30-50%. SAP bombs are engineered to attack light fortifications, whereas GP bombs are used in a mixed destructive blast and anti-personnel fragmentation role. 70% of bombs dropped on the UK were the 50kg type.
- **HE bombs – high NEQ:** blast bombs and parachute mines have bodies made of thin steel, allowing for larger HE charges. These were designed to detonate above ground, maximising the blast effect. Parachute mines were weapons slowed by parachutes and designed to detonate without penetrating the ground. Although, in some marshland areas, partially buried parachute mines have been observed. Consequently, it is highly unlikely that any unexploded blast bombs remain buried in the UK today.

- **HE bombs – low NEQ:** The PC series were armour piercing bombs used against heavy fortifications and reinforced bunkers. They were not commonly used over the UK.
- **Small incendiary bombs:** The 1kg and 2kg incendiaries were the most dropped bomb. Up to 620 x 1kg incendiaries could be packed into the largest container unit, which opened at a pre-determined height scattering its payload over a wide area. These small bombs could fully penetrate soft ground due to their small diameter. Variants of the 1kg and 2kg incendiary bombs contained a small HE charge designed for an anti-personnel role, and to increase its incendiary effect.
- **Large incendiary bombs - Thick skinned:** The C50 has a thick body and contained a mixture of incendiary liquids and white phosphorus. Another version of the C50 had a white phosphorus fill. The C50 'firepot' contained thermite incendiary containers (aka firepots) and a small HE charge.
- **Large incendiary bombs - Thin skinned:** The Flam 250 and Flam 500 models had thin steel bodies designed to break up on impact, spreading their oil-incendiary mixture, which was ignited by a small HE charge. Consequently, it is highly unlikely that any unexploded Flam bombs remain buried in the UK today. Their unreliability meant withdrawal from frontline use by January 1941.
- **Submunitions:** The SD2 'butterfly' bomb was a 2kg submunition dropped on several British cities and towns. It contained a 225gram HE charge. SD2s had no ground penetration ability so the vast majority were recovered at the time. However, SD2s are still found across Britain today.
- **V1 flying bombs and V2 rockets:** In the final year of WWII Germany began using pilotless weapons against England. Both V Weapons had 1,000kg HE warheads. Due to their light-body construction, they had no penetration ability and any impact left a noticeable debris field. As such, there is negligible risk from unexploded V weapons today.

## 6.2 Bomb Failures

Records from September 1940 to July 1941 show that an average of 84 UXBs were dropped on civilian targets each day. Around 8% of these were time delay bombs – designed to strike the ground and start a predetermined countdown which could last days.

There is a generally accepted 10% failure rate for WWII German HE bombs. This is estimated from records gathered by bomb disposal units. These statistics do not account for UXBs that went by unnoticed.

Failures can happen for different reasons, including:

- Equipment or human error in arming the bombs before release,
- Failure of a mechanism within the fuze (out of tolerance),
- Jettisoning payloads if the bomber was under attack or crashing, or
- Partially functioned bombs (e.g. cracks in the cast TNT)

## 6.3 Bomb Ground Penetration

### 6.3.1 Introduction

Using data gathered during WWII by the Ministry of Home Security, estimations can be made about how deep a bomb is likely to penetrate the ground. Over one thousand incidents were reported by the bomb disposal units to support this research. Further tests were carried out, dropping bombs of different sizes into chalk and measuring the depths they reached. This research is held at the National Archives. The estimates are:

| Bomb weight (kg) | Ground Type (m) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Sand | | Gravel | | Chalk | | Clay | |
| | Average | Max. | Average | Max. | Average | Max. | Average | Max. |
| 50 | 2.8 | 7.8 | 2.8 | 7.8 | 3.5 | 7.7 | 4.0 | 9.1 |
| 250 | 4.8 | 13.7 | 4.8 | 13.7 | 6.0 | 13.1 | 6.8 | 15.8 |
| 500 | 6.0 | 17.3 | 6.0 | 17.3 | 7.6 | 16.4 | 8.7 | 19.8 |
| 1,000 | 7.6 | 21.9 | 7.6 | 21.9 | 9.6 | 20.7 | 10.9 | 24.9 |

Different layers of geology affect penetration depths. For example, 1m of made ground, then 1m of gravel before reaching clay – as is many areas of London – is not easily calculated from the data above.

When calculating how deep a bomb could have reached, we must make three assumptions:

- **Impact velocity:** German bombing raids were carried out at altitudes in excess of 5,000m. The velocity of impact is roughly 313ms$^{-1}$ (not accounting for resistance). It is the same velocity regardless of mass.
- **Impact angle:** strike angles of 10 to 15 degrees to the vertical. It must be assumed that the bomb was stable at the moment of ground penetration.
- **Bomb design:** Some larger German bombs were occasionally fitted with 'kopfrings' - a metal ring, triangular in cross section, fitted around the nose of the bomb to help prevent penetration. It must be assumed that no 'kopfrings' were fitted.

### 6.3.2 The J-Curve Effect

During WWII BDUs reported that most buried UXBs were found horizontal or upturned. This observation confirmed the 'J-curve effect'. As an HE bomb penetrates the ground, slightly offset from the vertical, its passage underground creates a 'J' shape.

This is relevant because the J-curve effect results in a horizontal offset between the buried UXB and its point of entry. This is distance is estimated to be one third of the theoretical penetration depth. A low altitude attack, meaning a low impact angle, could produce an even greater offset, of up to 15m.

### 6.3.3 Site Specific Geology

| | | |
|---|---|---|
| **BGS Mapping** | **Superficial Deposits:**<br>Till, Devensian – Diamicton. | **Bedrock Deposits:**<br>Halesowen Formation - Mudstone, Siltstone And Sandstone. |
| **SI Data** | Recent SI data was provided by the Client. However, this data was not sufficient to calculate a maximum bomb penetration depth from, and local BGS borehole logs were sought. The closest BGS SI through the same mapped geology as the Site is located approximately 160m south of the Site (BGS ID: 526980). This SI (September 1969) encountered the following ground conditions:<br>- 1.2m of fill material.<br>- 3m of very stuff brown silty and sandy clay.<br>- 5.75m stiff brown sandy and silty clay.<br>- 1.15m of firm weathered grey shale. | |

### 6.3.4 Site Specific Maximum Bomb Penetration Depth

During WWII the Luftwaffe dropped many different types of HE bomb. The SC (general purpose) series was by far the most numerous and of this series, the SC 500 model (weighing 500kg) was the largest of the most commonly deployed and therefore this will be used as the benchmark weapon for the Site-specific bomb penetration depth calculations.

To calculate an approximate maximum bomb penetration depth, BSI would usually take the average of the averages of the figures for the predominant Site-specific geology present on Site in the table above. Unfortunately, it has not been possible to calculate an accurate maximum bomb penetration depth below WWII ground level for this particular Site due to the presence of the mudstone, siltstone and sandstone.

However, any UXB striking the structures on Site will have first passed through multiple stories. This will have caused the bomb to lose kinetic energy prior to ground penetration. This factor indicates that sections of the Site will have had a maximum bomb penetration depth significantly shallower than those comprising hardstanding. However, the combination of these factors makes calculating an accurate depth impossible.

NB: theoretically penetration depths could be greater if the UXB was larger, however, War Office statistics confirm that between October 1940 and May 1941 the majority of HE UXBs (>90%) were either 50kg or 250kg, with the 500kg bombs making up most of the remaining 10%.

# 7 UXO RISK - BRITISH/ALLIED ACTIVITY

## 7.1 Introduction

The table below lists potential sources of UXO (excluding enemy action). Those which are potentially relevant to the Site are discussed in the subsequent section(s).

| Potential UXO Source | Potentially Significant |
|---|---|
| Army or RAF training areas / ranges | ✗ |
| Military bases and other installations | ✗ |
| Munitions and explosives factories | ✗ |
| Military storage depots | ✗ |
| Defensive fortifications | ✗ |
| Wartime site requisitions | ✗ |
| WWII defensive mining (landmines) | ✗ |
| WWII Home Guard activity | ✗ |
| Wartime anti-aircraft fire | ✓ |

## 7.2 Potential Sources of UXO

### 7.2.1 Introduction

Research has not located any evidence of significant British or Allied army, RAF or Royal Navy activity specifically on Site and none is likely to have occurred historically. The only likely potential source of British UXO contamination is therefore WWII AA artillery fire.

### 7.2.2 Munitions and Explosive Factories

During WWI, many businesses were requisitioned to assist in the war effort. Gorton Brook Chemical Works, seen to the east of the Site in pre-WWII OS mapping, was one such company. The plant was initially tasked with manufacturing lyddite, or picric acid, the main high explosive filling in British shells during WWI. However, a number of factors, including the ill-adapted nature of the structure housing the production, meant that after a short period of time the plant was charged with manufacturing TNT instead.

It does not appear that the shells themselves were filled at Gorton Brook Chemical Works; rather, it is thought likely that the chemicals manufactured here would have been transported to a separate factory where the shells would have been filled with the charge. Furthermore, the Chemical Works was situated approximately 150m south-west of the Site and was also afforded the Union Iron Works as a buffer.

As the majority of the Site comprised residential structures and roadways, it is considered highly unlikely that any associated ordnance would have contaminated this land. However, a small area of open ground with no apparent use in the east may have been vulnerable to the unauthorised disposal or superfluous or malfunctioning ordnance from the factory. It must be noted that this is not considered to pose a significant risk.

### 7.2.3 WWII Anti-Aircraft Fire

Anti-Aircraft (AA) Command was a British Army command established in 1939 to defend the UK during the anticipated German bombing campaign. It controlled the Territorial Army AA artillery and searchlight units. From 1940 to 1945 BDUs dealt with 7,000 unexploded AA shells in Britain. There were three main types of AA battery used for home defence (see below). Data sheets on these AA defences are included at **APPENDIX 3**.

- **Heavy Anti-Aircraft (HAA):** large calibre guns (3.7” and 4.5”) for engaging high altitude bomber formations. Hundreds of permanent batteries were constructed in and around major cities and military bases during the 1930s. Some 2,000 of these guns were available during the Blitz. Each gun could fire between 10 and 20 rounds per minute and consequently HAA batteries could expend large quantities of shells during each engagement.

  British time fuses were poorly manufactured during WWII and this led to high failure rate for HAA shells, up to 30%. Unexploded HAA shells had the potential to land up to 27km from their battery, although more typically landed within a 15km radius.

- **Light Anti-Aircraft (LAA):** smaller calibre guns for engaging dive bombers and low altitude intruders. As such they were mostly used to defend specific industrial and military targets which were subject to precision bomber attack. LAA guns were either .303” calibre machine guns or 20mm and 40mm calibre cannon. The latter were fitted with simply impact fuses and small incendiary or HE bursting charges.

  The 40mm Bofors gun could fire 120 x HE shells / minute to a ceiling of 1,800m. Each shell was designed to self-destruct if it didn’t strike an aircraft, however, inevitably some failed and fell back to earth.

- **Z (Rocket) Batteries**: a Z-Battery comprised a grid formation of 64 rocket projectors which fired 2” and later 3” Unrotated Projectile (UP) rockets to a maximum altitude of 5,800m; a ground range of some 9,000m. They were deployed in cities all around the UK from 1941 and proved to be an effective addition to the existing AA guns.

  The rockets measured 0.9m (2”) and 1.8m (3”) in length with four stabilising fins at the base and were fitted with 3.5kg or 8.2kg HE warheads. The larger warhead had an effective airborne blast radius of up to 20m. Some variants deployed a form of aerial mine described as a “small yellow bomb” which was designed to detach from the rocket at height and descend on a parachute with the objective of becoming snagged on target aircraft and then detonating.

Unlike bombs which were designed to strike the ground, AA projectiles and rockets were designed to function in the air. Due to their shape, and centre of gravity they would often not strike the ground nose first. This coupled with the lower mass of AA UXO resulted in shallower ground penetration depths, compared to UXBs. Although, in very soft conditions, unexploded AA projectiles have been found deeper than 1.5m bgl.

Numerous (<30) permanent HAA batteries were active within range of the Site during WWII. LAA guns likely defended Vulnerable Points within the borough. Luftwaffe activity was frequent and intense over the wider area and therefore these guns would have expended a vast quantity of ammunition. Consequently, there is an elevated likelihood of unexploded AA shells striking the Site. However, any such UXO is unlikely to have penetrated the ground on Site unseen.

# 8 UXO RISK MITIGATING CIRCUMSTANCES

## 8.1 Introduction

Works on a UXO contaminated site could result in the partial or complete removal of UXO risk. Construction or earthworks may have uncovered any UXO contamination, which would then have been reported and removed by the authorities. A site may have been subject to an explosive ordnance clearance (EOC) task conducted by the armed forces. EOC tasks involve surveying, subsequent target investigation and removal of UXO. Although the effectiveness of historic EOC tasks will have often been unsatisfactory.

## 8.2 Explosive Ordnance Clearance Tasks

The division of EOD tasks has been complex throughout British military history. It used to be the case that anything under the water level would be dealt with by navy units, and anything on land would be dealt with by army units. In recent years RAF EOD capability has been discontinued, and now only the Royal Navy and the British Army have EOD units. In the army, the Royal Logistics Corps and Royal Engineer EOD units have been amalgamated to form 29 EOD & Search Group. Often taskings are assigned to either the naval or army elements based on where in the country the threat is and the nature of the threat.

BSI has access to a database of historic EOC tasks. This database is only complete up until the early 2000s and therefore does not include recent EOC tasks. No such database for the RAF and Royal Navy EOD units is easily accessible. A search of this database has not resulted in any Army EOC tasks in the vicinity of the Site.

UXO encounters on civilian land are often reported in the media and therefore a web search of local media outlets was also carried out. No recent incidents within close proximity to the Site were identified.

## 8.3 Ground Works

It is conceivable that some of the post-conflict ground works required deep excavations; contemporary, albeit poor quality aerial photography, appears to indicate that the structure built in the southern/central sections of the Site post-WWII was high rise. It is possible that structures built further east, since cleared, would also have required deep excavations. The grubbing out of foundations of pre-WWII structures would have disturbed soil down to the maximum depth of these foundations, the majority of which are thought to be shallow.

## 8.4 Deductions

The risk associated with any deep buried German UXBs will likely have been mitigated in the locations of possible deep excavations in the southern/central sections of the Site. The risk associated within any very shallow/shallow buried UXO will have been largely mitigated by the extensive groundworks that have occurred on Site with the clearing and subsequent grubbing out of foundations of the post-WWII structures

# 9 CONCLUSION

## 9.1 Accuracy of Historical Records

Occasionally, the accuracy of some historical records can prove to be poor when compared with other sources of information. One significant consequence of this can be the possibility of unrecorded German bomb strikes in the study area.

The bomb plot / damage map shows several areas of damage with no corresponding bomb strike. It is likely therefore that bomb strikes in the vicinity are missing. However, this is not considered significant with regards to the UXO risk assessment, as the Site does not appear to have sustained any bomb damage.

## 9.2 The Risk of UXO Contamination on Site

### 9.2.1 Key Findings - German UXO Risk

- Greater Manchester was the 11th most heavily bombed British conurbation during WWII. Like today, the Site occupied a location on the periphery of the city centre during the Blitz, although confirmed Luftwaffe bombing targets were situated in the vicinity. However, it does not appear to have experienced a high bombing density, as only two raids are recorded to have affected the wider Site area.
- A bomb plot and damage map covering all air raids on the city was analysed, as was a map denoting civilian casualties as a result of bombing incidents. These confirm that the study area was affected by at least two air raids, resulting in 14 incendiary bombs within a 400m radius of the Site. No HE bombs were recorded in this radius. This map does not record sections of the wider Site area (which occupied part of the 300m radius to the south/south-east of the Site) and therefore multiple additional bombs may have occurred within the vicinity. However, unrecorded bombs in these areas would not pose a risk to the Site.

- As all bomb strikes in the wider Site area were incendiary bombs, it has not proved possible to identify individual bombload alignments in relation to the Site. While these bombs may not have been significantly affected by the wind and were dropped by a plane whose flightpath generally aligned with the Site, this cannot be ascertained for certain.
- Records of exploded and unexploded HE bombs dropped during the Manchester Blitz give a failure rate of 16.6%; a significantly higher figure than the widely accepted 10% average for Britain as a whole. However, as the Site does not appear to have been subject to significant damage, this factor is not thought to have an impact on this risk assessment.
- At the commencement of the Blitz, the Site was almost entirely occupied by terraced, residential structures in the west, with a small cluster of industrial/commercial structures in the east. Multiple roadways intersected the Site. A comparison of the historical records confirms that the vast majority of these structures survived the war intact with no significant damage sustained. Any UXB strike to these structures or the roadways would have caused incontrovertible evidence of its incidence.
- Furthermore, this apparent lack of bomb damage increases the likelihood that these structures were accessed on a frequent basis throughout WWII. This increases the likelihood that evidence of a UXB, within undamaged structures, would have been observed and reported at the time.

### 9.2.2 Key Findings - British UXO Risk

- Numerous (<30) permanent HAA batteries were active within range of the Site during WWII. Luftwaffe activity was frequent and intense over the wider area and therefore these guns would have expended a large quantity of ammunition. Consequently, it is quite possible that an unexploded AA shell struck the Site.
- A WWI-era chemical works was located approximately 150m north-east of the Site. This plant manufactured chemicals and TNT during WWI. However, as the majority of the Site comprised terraced structures, there is no associated risk of UXO contamination across most of the Site. There is a slightly elevated risk of UXO contamination in an area of seemingly insignificant ground in the east, although this risk is not considered significant enough to warrant proactive risk mitigation measures.

## 9.3 Site-Specific UXO Hazards

Different types of UXO pose differing types of hazard, depending on their structural design, Net Explosive Quantity (NEQ), fill type and likely contamination depth. The table below lists the main types of UXO most often encountered on urban UK sites and their relative hazard levels.

| UXO Type | NEQ (NEQ Range) | Likely Burial Depth | Hazard Posed |
|---|---|---|---|
| WWII German General Purpose HE Bombs | 25kg - 220kg (most commonly deployed bomb weights) | Likely deep burial (>3m) | **HIGH RISK** |
| WWII British Heavy Anti-Aircraft Shells | 1.1kg - 1.7kg | Shallow burial (<1.5m) | **MODERATE-HIGH RISK** |
| WWII British Land Service Ammunition | <2kg | Shallow burial (<1.5m) | |
| WWII German 2kg Incendiary / HE Bombs | 680g incendiary hazard + ~500g explosive hazard | Shallow burial (<1.5m) | |
| WWII German 1kg IBs | 680g (incendiary, not explosive hazard) | Shallow burial (<1.5m) | **MODERATE RISK** |
| WWII British Light Anti-Aircraft Shells | 4g - 70g | Very shallow burial (<1m) | **LOW-MODERATE RISK** |

## 9.4 The Likelihood of UXO Encounter

### 9.4.1 Introduction

This report assesses the risk of UXO in relation to the proposed works, not simply the risk that UXO remains buried on site. The likelihood of UXO encounter during intrusive ground works will vary depending on the type of UXO and the type of construction methods employed during the project. With increased soil disturbance i.e. more excavations, the likelihood of encountering UXO increases.

Within an area of elevated UXO contamination likelihood, the sub-surface volume of potential UXO contamination will comprise the natural soil / geology in between WWII ground level and the maximum bomb penetration depth. Therefore, any intrusions into this layer will be at risk of UXO encounter.

Any post-WWII fill material deposited on a site is unlikely to be contaminated with UXO and therefore the risk of encountering UXO on such a site could vary with depth.

In the wake of the initial nine-month Blitz, many cities and towns were left with vast quantities of bomb site rubble that required removal and relocation. This material was put to use for in a variety of ways, for example >750,000 tons of London's rubble was used to build runways for new RAF and USAAF airfields and much of Liverpool's rubble was used to create and maintain sea / flood defences throughout Merseyside.

It is quite possible that unexploded British AA projectiles and German 1kg incendiaries were overlooked during removal, resulting in UXO contaminated fill material ending up on otherwise low UXO risk sites, possibly many miles from any high bombing density areas.

### 9.4.2 German UXBs

Although most German UXBs came to rest several metres below WWII ground level, these weapons can be found at any level between just below WWII ground level and the maximum bomb penetration depth. There are a number of reasons why these heavy bombs might be found at surprisingly shallow depths.

- **Tip and run:** When enemy aircraft had to take evasive action to escape RAF fighter intercepts or AA defences, they often dropped their bomb loads from a reduced height, potentially resulting in extreme J-curve effect.
- **Deflection:** the shape of German bomb nose sections meant they were susceptible to deflection when striking surface or shallow sub-surface obstacles, occasionally resulting in shallow burial or even UXBs skidding across hardstanding.
- **Aircraft Crash Site:** if an aircraft was unable to dump its bomb load before impacting the ground, due to mechanical fault, any externally fitted bombs could have become buried on impact.

German 1kg / 2kg incendiaries were cylindrical and approximately 50mm in diameter. They had tail sections, and so landed nose first. Within soft ground this could result in full penetration of the bomb below the surface. Such UXBs are usually found close to the surface.

### 9.4.3 British / Allied UXO

The nature of British/Allied military activity involving LSA and SAA and the smaller size of these munitions (in relation to German HE bombs) indicates that any resulting UXO contamination on a site will be limited to shallow depths, usually within 1.5m of the surface, notwithstanding added material to raise the ground level.

Domestic military LSA and SAA contamination will either be the result of expending blinds (dud ammunition) which bury into the ground on impact or munitions purposefully buried, for a number of reasons. Either way, these types of UXO are all found at shallow depth.

### 9.4.4 Deductions

Significant ground works have already occurred on Site with the construction of structures, some of which required deep foundations; these structures and foundations at shallow depths have now been cleared. NB: Some piles may have been left in-situ. This greatly reduces the risk of a UXO encounter at shallow depths. As only minimal ground works have occurred at deep depths, the risk is thought to largely remain unmitigated at these depths. However, it must be noted that this is not considered to be a significant risk.

## 10 OVERALL RISK RATING

Ratings for the likelihood of UXO contaminating the Site, remaining within the Site up to the present day and being encountered during the proposed works, inform the overall risk rating. The UXO risk to the proposed works varies. **Low** and **Low-Moderate** risk zones have been identified. These are illustrated on a Risk Map displayed at **FIGURE 8**.

| Risk Table: Low Risk | | | | |
|---|---|---|---|---|
| UXO TYPE (ASSOCIATED HAZARD) | LIKELIHOOD OF UXO CONTAMINATION | LIKELIHOOD OF UXO REMAINING | LIKELIHOOD OF ENCOUNTER | OVERALL RISK RATING |
| **WWII German 'Iron' Bombs** | Low-Moderate | High | Low | **Low** |
| **WWII British Heavy Anti-Aircraft Shells** | Moderate | High | Low | |
| **WWII British Land Service Ammunition** | Low | n/a | | |
| **WWII German 2kg Incendiary / HE Bombs** | Low-Moderate | Moderate | Low | |
| **WWII German 1kg Incendiary Bombs** | Low-Moderate | Moderate | Low | |
| **WWII British Light Anti-Aircraft Shells** | Low | n/a | | |

| Risk Table: Low-Moderate Risk | | | | |
|---|---|---|---|---|
| UXO TYPE (ASSOCIATED HAZARD) | LIKELIHOOD OF UXO CONTAMINATION | LIKELIHOOD OF UXO REMAINING | LIKELIHOOD OF ENCOUNTER | OVERALL RISK RATING |
| **WWII German 'Iron' Bombs** | Low-Moderate | High | Low | **Low** |
| **WWII British Heavy Anti-Aircraft Shells** | Moderate | High | Low | |
| **WWII British Land Service Ammunition** | Low-Moderate | Low-Moderate | Low-Moderate | **Low-Moderate** |
| **WWII German 2kg Incendiary / HE Bombs** | Low-Moderate | Moderate | Low | **Low** |
| **WWII German 1kg Incendiary Bombs** | Low-Moderate | Moderate | Low | |
| **WWII British Light Anti-Aircraft Shells** | Low | n/a | | |

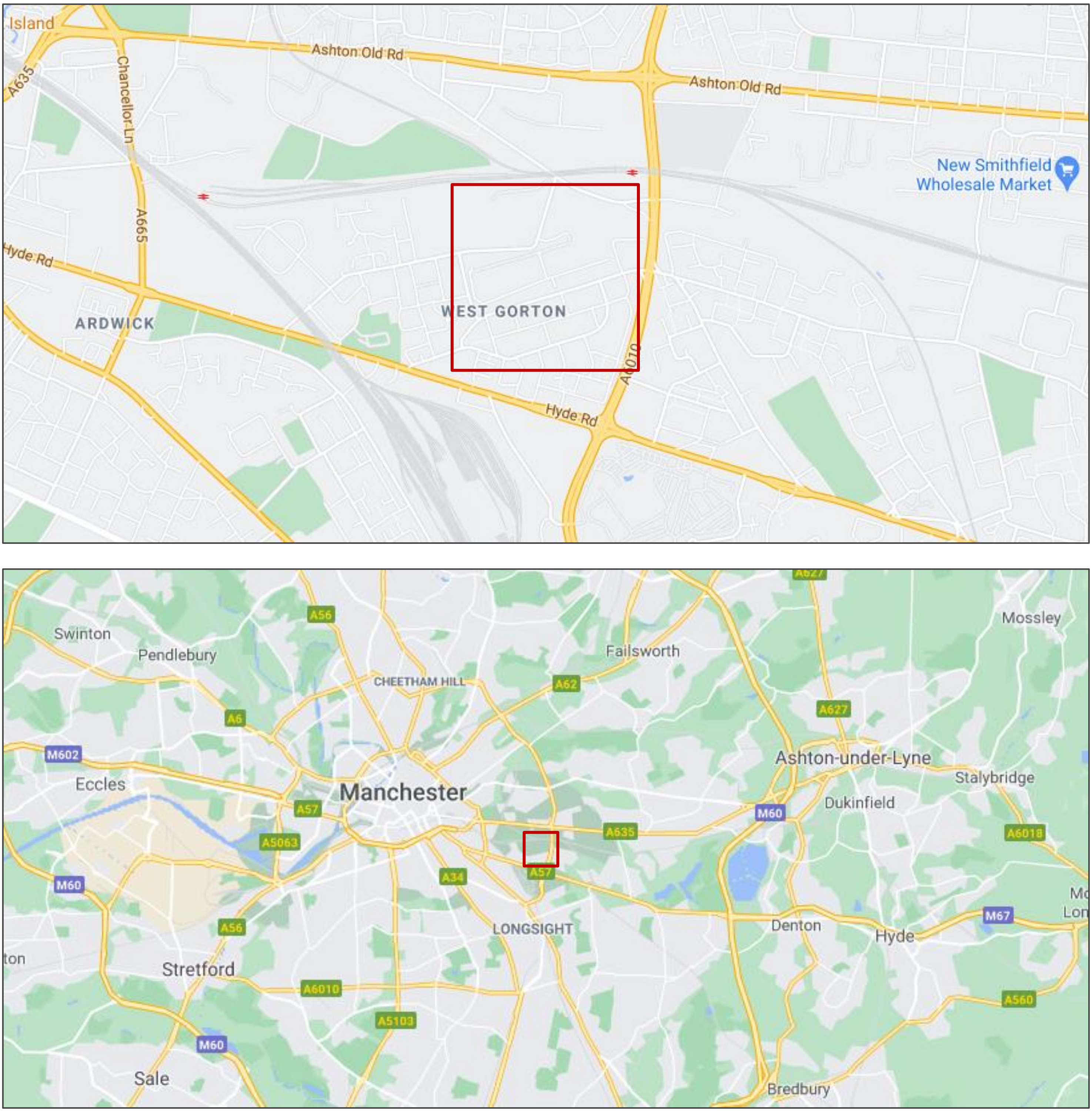
## 11 RISK MITIGATION RECOMMENDATIONS

BSI has identified a slightly elevated UXO risk to some of the proposed works. The measures detailed below are recommended to mitigate the risk to ALARP level.

| Risk Mitigation Measure | Recommendation |
|---|---|
| **UXO Safety Awareness Briefings**: To all personnel conducting intrusive works on Site. An essential part of the Health & Safety Plan for a site. Conforms to the requirements of CDM2015. | Prior to all intrusive works commencing within both risk zones. |

# Figures: 1 - 8

**Title:** Site Location Maps **FIGURE: 1**


Island
A635
Chancellor Ln
Ashton Old Rd
Ashton Old Rd
A665
Hyde Rd
ARDWICK
WEST GORTON
A6010
Hyde Rd
New Smithfield Wholesale Market
Swinton
Pendlebury
A56
CHEETHAM HILL
A62
Failsworth
Mossley
A627
A6
M602
Eccles
Manchester
Ashton-under-Lyne
Stalybridge
Dukinfield
M60
A57
A5063
A635
A6018
M60
A34
A57
LONGSIGHT
Denton
Hyde
M67
A56
ton
Stretford
A6010
A5103
A560
M60
Sale
Bredbury

N

| | |
|---|---|
| Project | **Space Studios, Gorton** |
| Client: | **IGE Consulting Ltd.** |
| Report Ref: | **DRA-21-1283** |
| General Site Location | Info Source: Google (open-source) |

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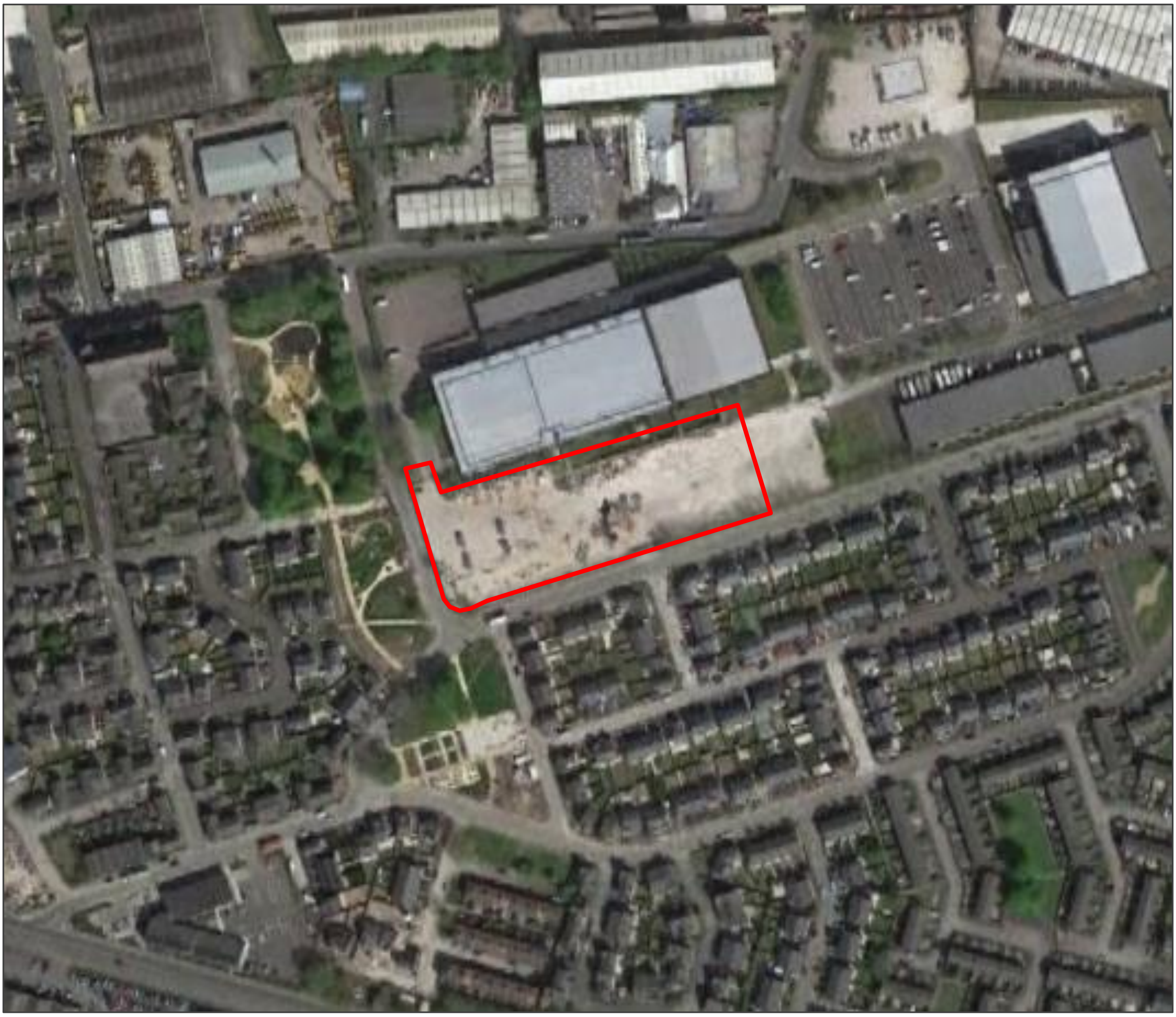
enquire@brimstoneuxo.com

**Title:** Recent Aerial Photograph

**FIGURE: 2**



N

Project: **Space Studios, Gorton**

Client: **IGE Consulting Ltd.**

Report Ref: **DRA-21-1283**

— Approx. Site Boundary

Info Source: Google (open-source)

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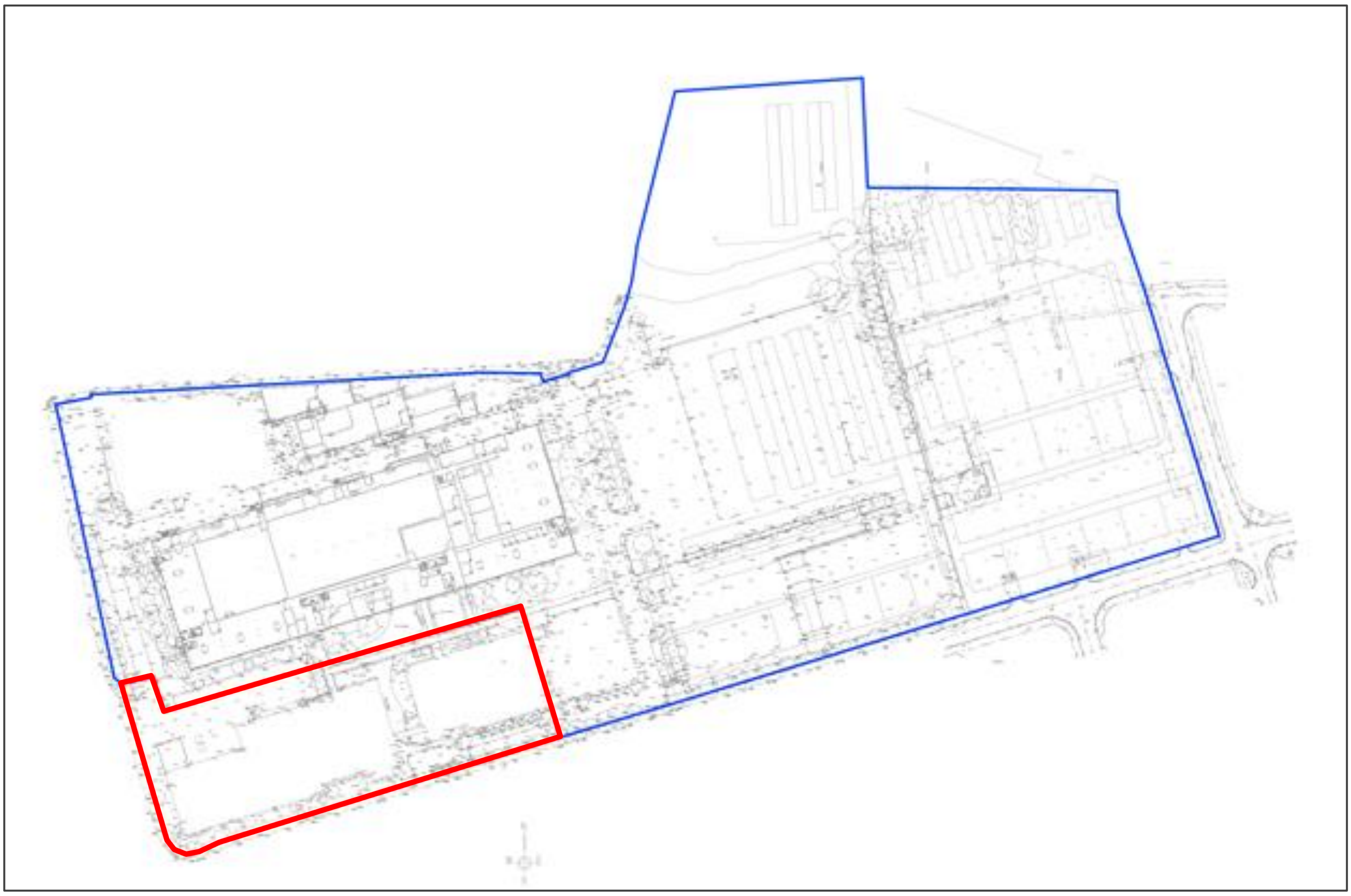
**Title:** Current Site Plan

**FIGURE: 3**



N

| | |
|---|---|
| Project | **Space Studios, Gorton** |
| Client: | **IGE Consulting Ltd.** |
| Report Ref: | **DRA-21-1283** |
| 🟥 Approx. Site Boundary | Info Source: Mountwood Homes |

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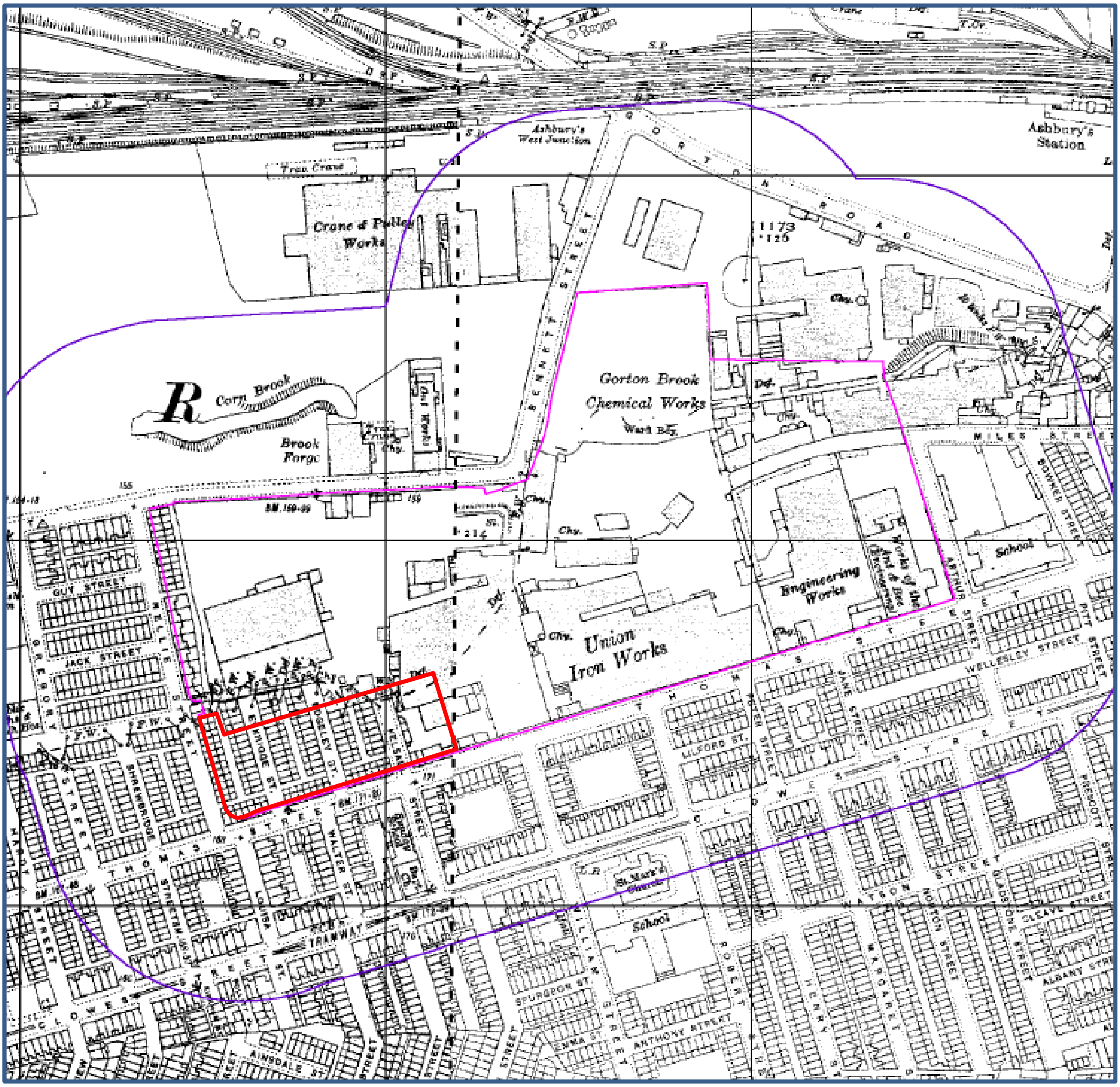
**Title:** Historical OS Mapping – 1922

**FIGURE: 4.1**


Crane & Pulley Works
Trav. Crane
Ashbury's West Junction
Ashbury's Station
Gorton Road
Bennett Street
Corn Brook
Brook Forge
Gorton Brook Chemical Works
Works
Chy.
Union Iron Works
Engineering Works
Miles Street
School
Guy Street
Jack Street
Nellie Street
Gregory Street
Thomas Street
Wellesley Street
Milford St.
Jane Street
Walter St.
Louisa Street
Tramway
St. Mark's Church
School
William Street
Spurgeon St.
Emma St.
Anthony Street
Robert Street
Henry Street
Margaret Street
Norfolk Street
Albany Street
Cleave Street
Ainsdale St.

N

| | |
|---|---|
| Project | **Space Studios, Gorton** |
| Client: | **IGE Consulting Ltd.** |
| Report Ref: | **DRA-21-1283** |
| Approx. Site Boundary | Info Source: ProMaps |

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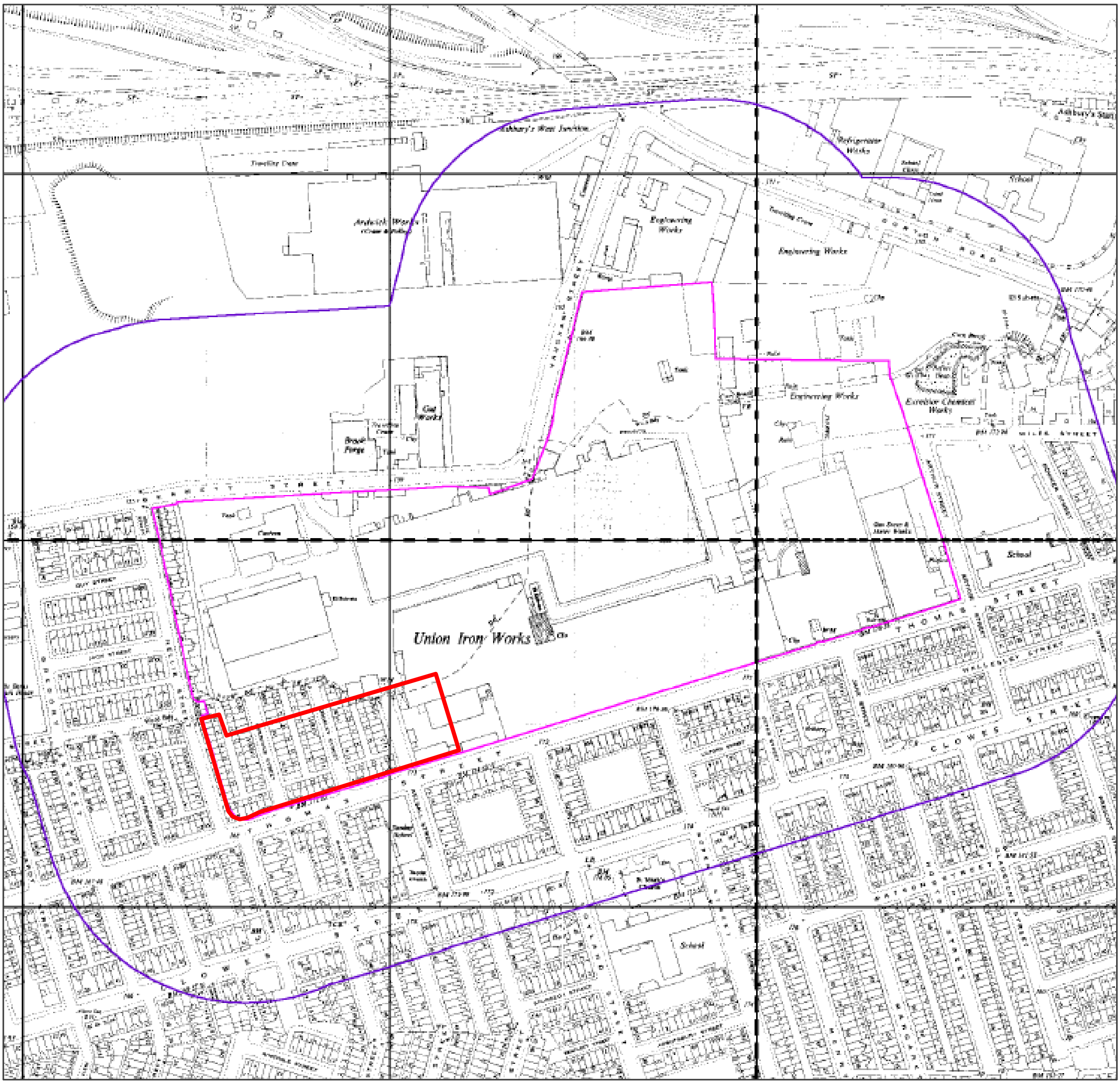
**Title:** Historical OS Mapping – 1948-1950

**FIGURE: 4.2**



Union Iron Works
Engineering Works
Excelsior Chemical Works
School
Ashbury's West Junction
Refrigerator Works
Gas Works
Ardwick Works

N

| | |
|---|---|
| Project | **Space Studios, Gorton** |
| Client: | **IGE Consulting Ltd.** |
| Report Ref: | **DRA-21-1283** |

🟥 Approx. Site Boundary

Info Source: ProMaps

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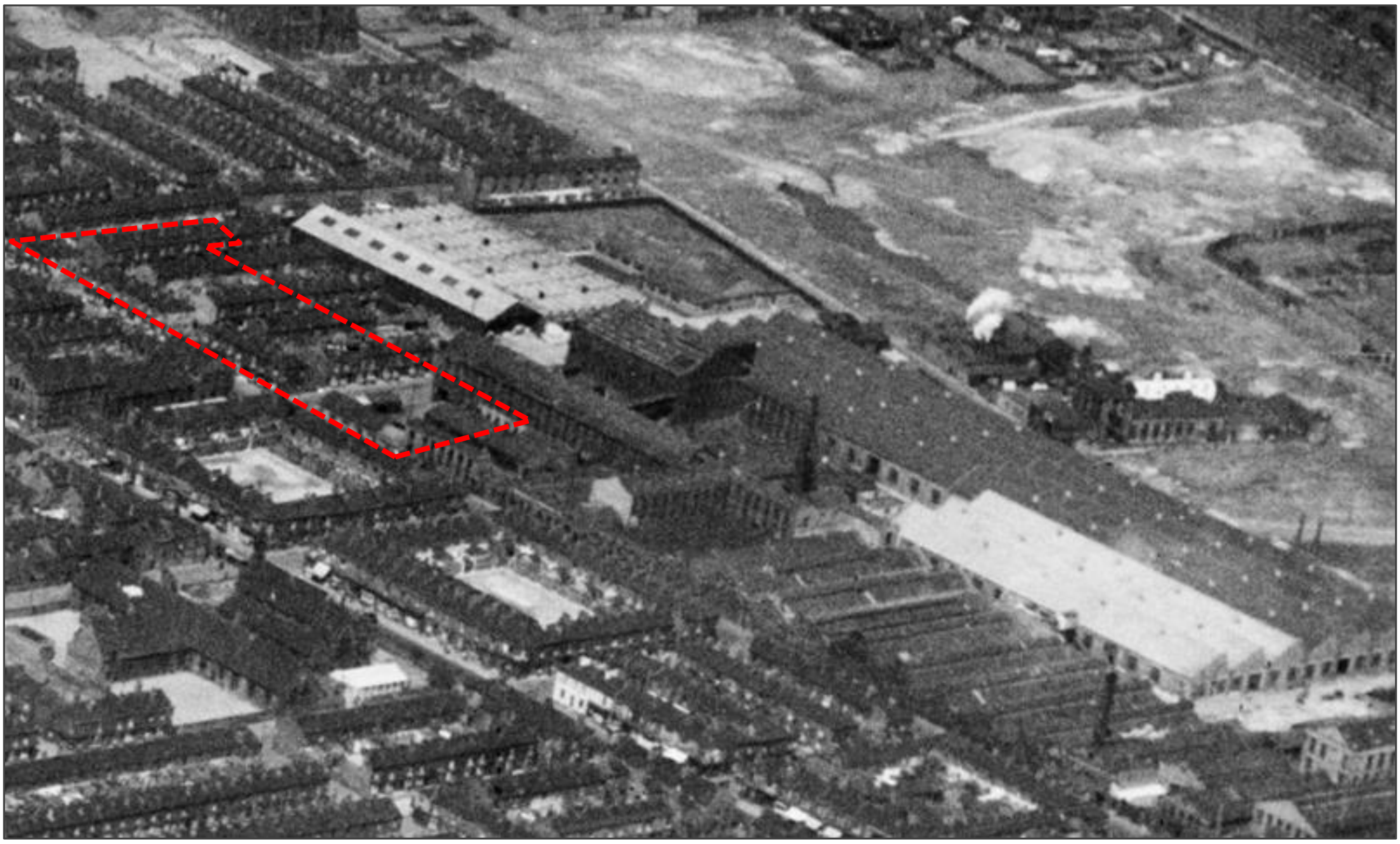
Title: Post-WWII Oblique Photography

FIGURE: 5



N

Project: **Space Studios, Gorton**

Client: **IGE Consulting Ltd.**

Report Ref: **DRA-21-1283**

----- Partial/Site Boundary

Info Source: Britain from Above

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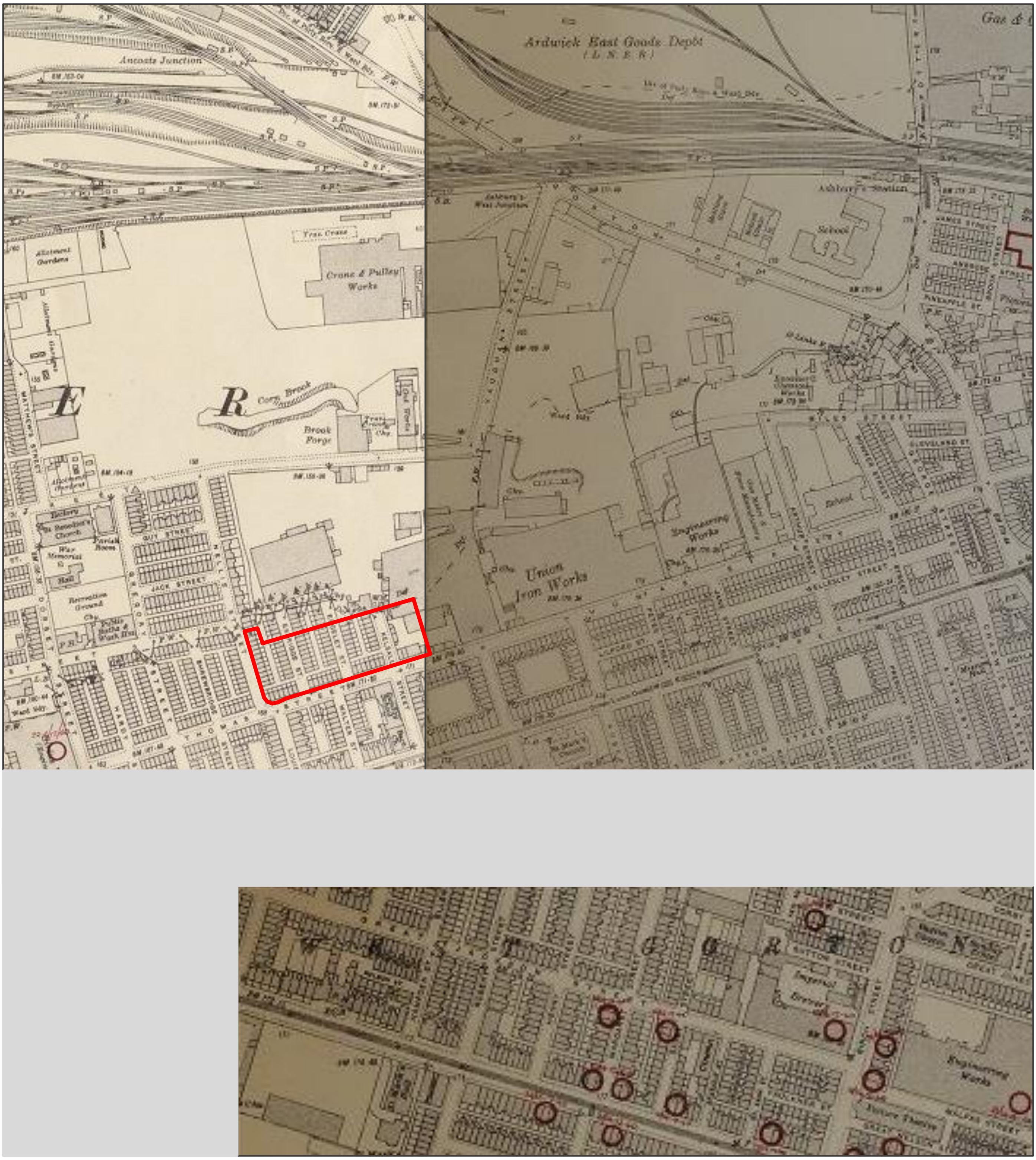
Title: **Manchester Bomb Map** **FIGURE: 6**


Ancoats Junction
Crane & Pulley Works
Brook Forge
Ardwick East Goods Depôt
(L. N. E. R.)
Ashbury's Station
School
Union Iron Works
Engineering Works

☐ Demolished buildings. This does not apply to the red Site boundary.

○ Incendiary bomb

NB: Due to the Site and the surrounding areas being spread across different mapping sheets, some of the surrounding areas are not present.

N

Project: **Space Studios, Gorton**

Client: **IGE Consulting Ltd.**

Report Ref: **DRA-21-1283**

— Approx. Site Boundary

Info Source: Manchester Library

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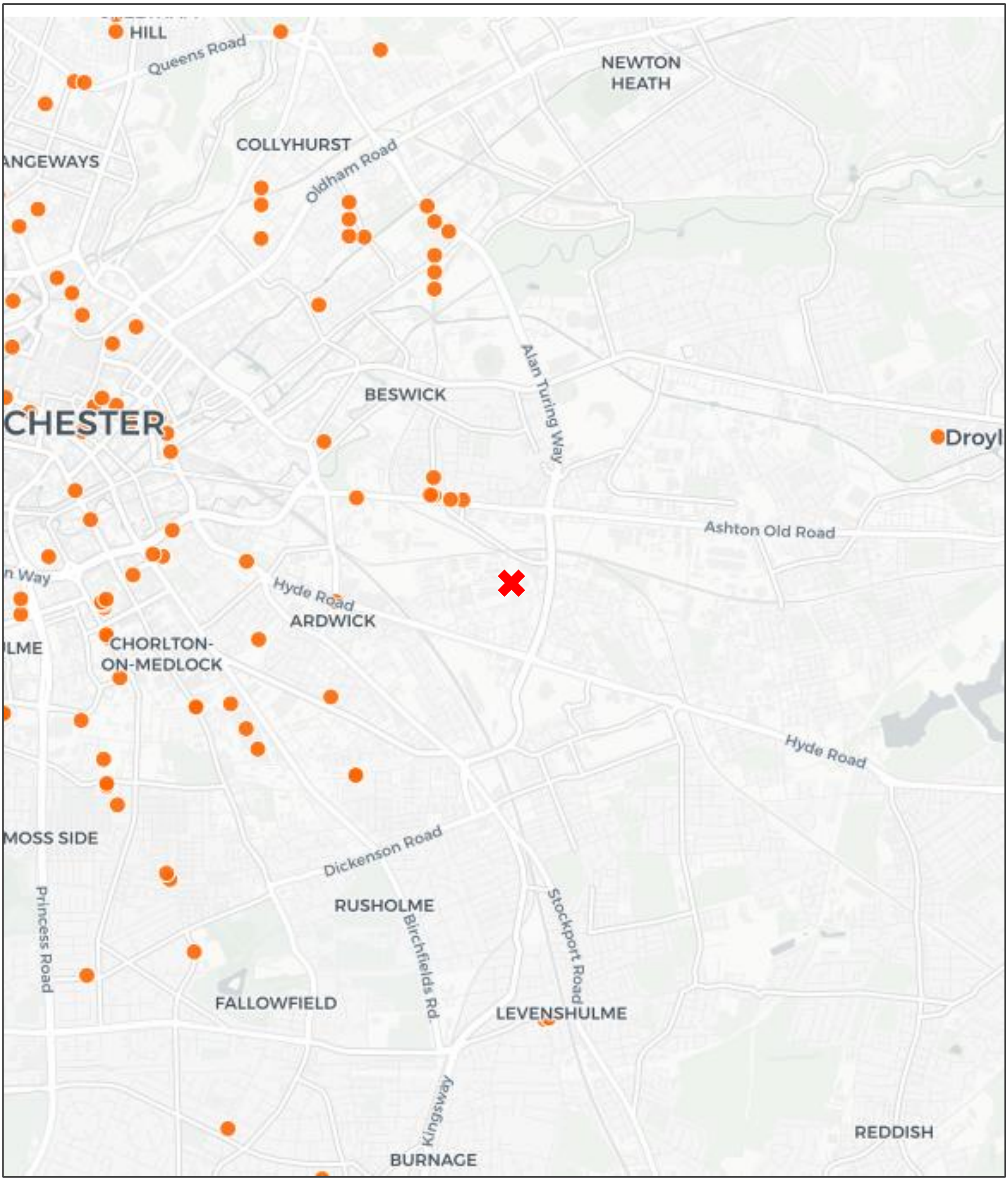
| Title: | Manchester Civilian Fatalities Map – 22nd – 24th December 1940 | FIGURE: 7 |
|---|---|---|


HILL
Queens Road
NEWTON HEATH
COLLYHURST
Oldham Road
ANGEWAYS
BESWICK
Alan Turing Way
CHESTER
Droyl
Ashton Old Road
n Way
Hyde Road
ARDWICK
LME
CHORLTON-ON-MEDLOCK
Hyde Road
MOSS SIDE
Dickenson Road
RUSHOLME
Princess Road
Birchfields Rd.
Stockport Road
FALLOWFIELD
LEVENSHULME
Kingsway
REDDISH
BURNAGE

● Casualty caused by a bomb strike

N

| | |
|---|---|
| Project | Space Studios, Gorton |
| Client: | IGE Consulting Ltd. |
| Report Ref: | DRA-21-1283 |

✖ General Site Location

Info Source: Manchester Evening News

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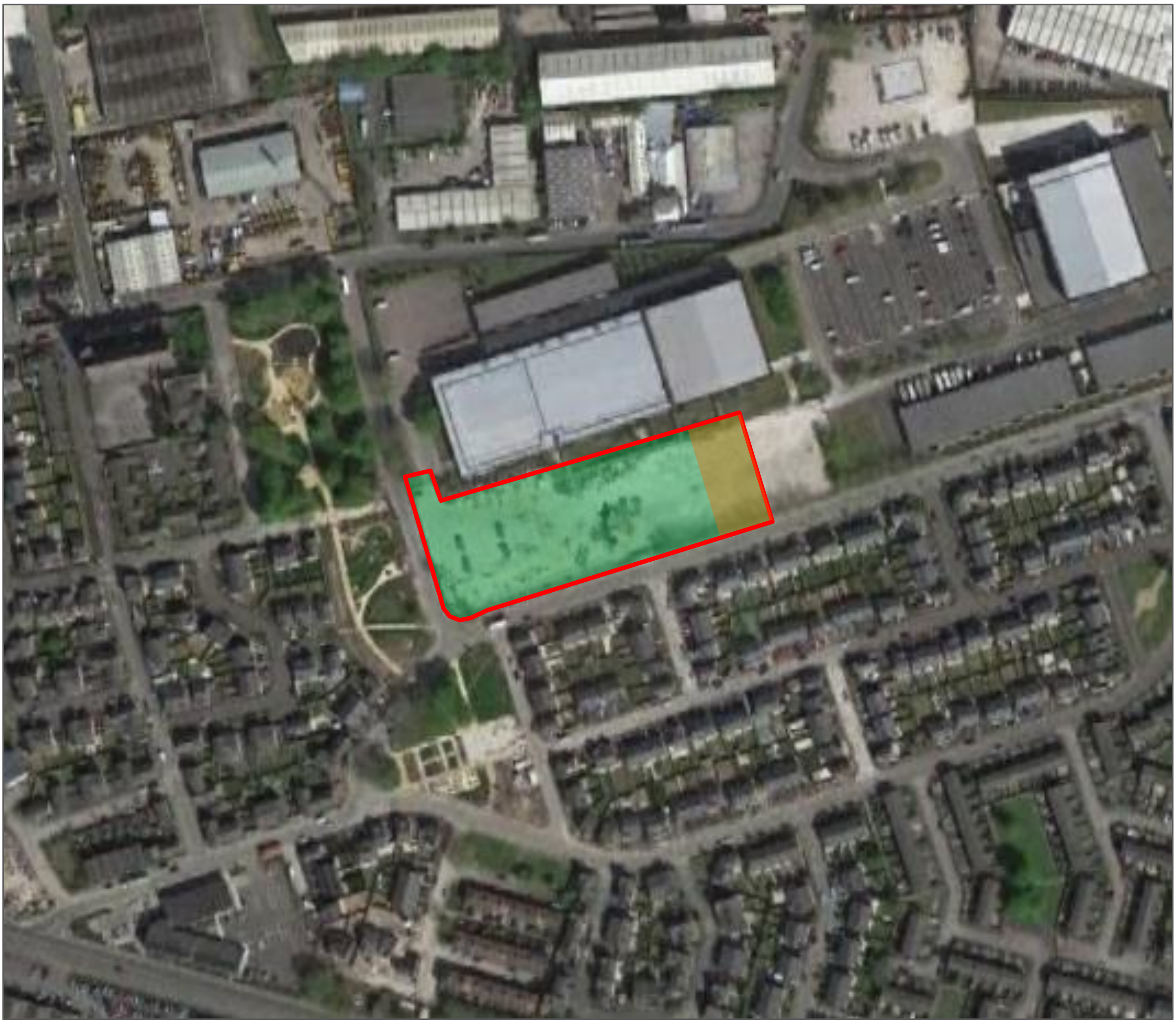
Title: **Risk Map** FIGURE: 8



**LOW UXO RISK:** Low likelihood of German HE UXBs/IBs remaining here.

**LOW-MODERATE UXO RISK:** Slightly elevated likelihood of British LSA related ordnance remaining here.

N

| | |
|---|---|
| Project | Space Studios, Gorton |
| Client: | IGE Consulting Ltd. |
| Report Ref: | DRA-21-1283 |
| — Approx. Site Boundary | Info Source: Google (open-source) |

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# Appendices: 1 - 5

## Recent German UXB Finds in the UK + Historical Analysis

- ***23rd May 2019*** - An SC250 (standard 250kg HE bomb) was found during shallow excavations at a building site in Kingston upon Thames, London. *Historical Analysis: The UXB landed in a small residential back garden belonging to an undamaged terraced house. It came to rest approximately 3 to 4m bgl.*
- ***15th May 2017 -*** An SC250 (standard 250kg HE bomb) was found during shallow excavations at a building site in Aston, Birmingham. *Historical Analysis: The UXB landed in a small back garden belonging to a terraced house, part of a row. It J-Curved under a neighbouring garden and came to rest at just 1.4m bgl. NB: These houses had not sustained bomb damage.*
- ***2nd March 2017 -*** A 250kg HE bomb was found during deep excavations at a building site in Brondesbury Park, London. *Historical Analysis: UXB landed in a large residential back garden. A single storey building was built on top of the UXB post-WWII.*
- ***19th January 2017 -*** An SD50 (semi-armour piercing 50kg HE bomb) was dredged from the Thames during barge dredging works near Westminster Bridge, London.
- ***12th May 2016 -*** A 500kg HE bomb was found buried just 1m below the playground of the former Royal High Junior School in Bath. *Historical Analysis: The UXB landed in a plot of neglected, unmaintained vegetation in between the school gym and main school building.*
- ***23rd September 2015 -*** A 1,000kg HE bomb was encountered by a mechanical excavator on a building site in Paradise Street, Coventry. *Historical Analysis: the UXB landed in a large residential back garden occupied by dense vegetation. A two storey building was built on top of the UXB post-WWII.*
- ***10th August 2015 -*** A 250kg HE bomb was found immediately beneath a basement floor during refurbishment works in Temple Street, Bethnal Green (London). *Historical Analysis: The UXB struck a house that had been damaged beyond repair during a previous air raid. The existing house was then built on top of UXB post-WWII.*
- ***21st May 2015 -*** An SC50 (general purpose 50kg HE bomb) was found during deep excavations at a construction site in Wembley, London. *Historical Analysis: UXB landed in a large residential back garden.*
- ***23rd March 2015 -*** A 250kg HE bomb was found during deep excavations at a building site in Grange Walk, Bermondsey (London). *Historical Analysis: inconclusive - reported UXB position is likely inaccurate.*

**NB:** Domestic UXO finds in the UK are too numerous to list. Between 2006 and 2009, over 15,000 items of British / Allied UXO (excluding small arms ammunition) were found on UK construction sites (CIRIA).

## Initiation of WWII Allied Bombs

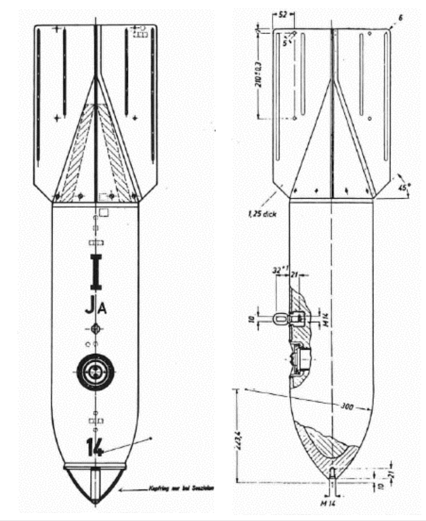
- ***6th January 2014 -*** Mechanical excavator stuck a WWII bomb in Euskirchen (Germany) causing it to explode, killing the operator and injuring 13 more, two critically. The explosion was so large it damaged buildings 400m away.
- ***1st March 2013 -*** During piling at a construction site in Ludwigshafen (Germany) a small buried WWII bomb exploded, injuring one worker.
- ***2nd June 2010 -*** A British 500kg bomb detonated whilst being defused, killing three EOD engineers in Goettingen, Germany. The bomb was found as builders dug the foundations for a new sports hall. Several houses had their fronts blown off by the blast.
- ***19th September 2008 -*** Seventeen people were injured and buildings were damaged when an excavator apparently drove over and set off a 250kg American bomb at a construction site in Hattingen, Germany.
- ***23rd October 2006 -*** A construction worker breaking up tarmac at the side of a highway near the south-western German town of Aschaffenburg was killed when his machine struck and detonated a WWII bomb. In addition, the blast injured several motorists who were driving past.
- ***2006 -*** A piling rig and dump truck were destroyed when a piling rig struck an Allied bomb on a construction site in Austria.
- ***2003 -*** In the Austrian city of Salzburg, two people were killed while attempting to defuse a 250kg Allied bomb.
- ***1994 -*** At a central Berlin construction site a piling rig struck a large WWII Allied bomb. 3 were killed and 14 more were injured. Dozens of cars in a 250m radius were wrecked, the top 10 floors of neighbouring office building collapsed and human remains were found 100m away.
- ***1990*** - In Wetzlar (Germany) two EOD engineers were blown up as they removed the detonator of an allied WWII UXB.

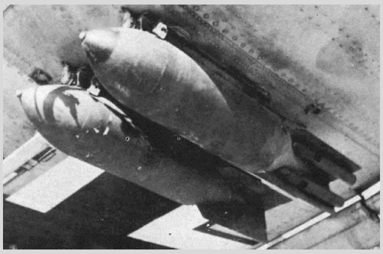
| Info Source: | *Various* |

**Title:** German WWII Air-Delivered Munitions - Most Commonly Deployed High Explosive **APPENDIX: 2.1**

## SC 50

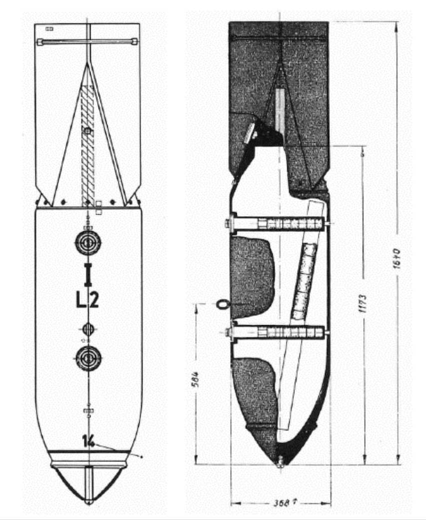
| | |
|---|---|
| **Bomb Weight:** | 40-54kg (110-119lb) |
| **Explosive Weight:** | 25kg (55lb) |
| **Filling:** | TNT, Amatol or Trialen |
| **Charge/Weight Ratio:** | 46% |
| **Fuse Type:** | Electrical impact fuse or mechanical delayed action fuse |
| **Body Dimensions:** | 1,100mm length x 200mm diameter |
| **Appearance:** | Bomb body and tail painted grey/green with a yellow stripe on the tail unit. Steel construction. |
| **Variants:** | 8 x variants. Additional fittings: Kopfring nose for limited penetration and Stabbo nose for dive-bombing. |





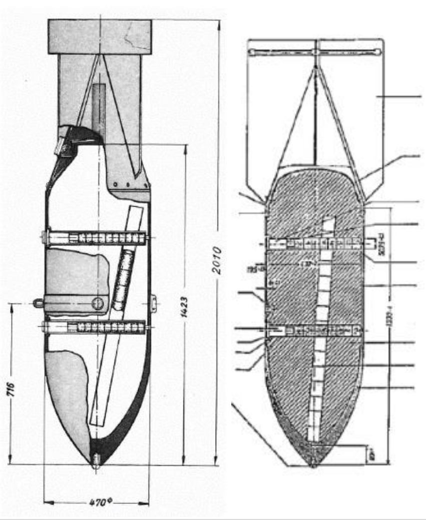
## SC 250

| | |
|---|---|
| **Bomb Weight:** | 245-256kg (540-564lb) |
| **Explosive Weight:** | 125-130kg (276-287lb) |
| **Filling:** | TNT, Amatol and Trialen mix |
| **Charge/Weight Ratio:** | 44% |
| **Fuse Type:** | 1 or 2 electrical impact fuse(s) or mechanical delayed action fuse(s) |
| **Body Dimensions:** | 1,173mm length x 368mm diameter |
| **Appearance:** | Bomb body and tail painted grey/green with a yellow stripe on the tail unit. Steel construction. |
| **Variants:** | 8 x variants. Kopfring nose for limited penetration. Stabbo nose for dive-bombing. |



## SC 500

| | |
|---|---|
| **Bomb Weight:** | 480-520kg (1,058-1,146lb) |
| **Explosive Weight:** | 220kg (485lb) |
| **Filling:** | TNT, Amatol and Trialen mix |
| **Charge/Weight Ratio:** | 44% |
| **Fuse Type:** | 2 electrical impact fuses or mechanical delayed action fuses |
| **Body Dimensions:** | 1,423mm length x 470mm diameter |
| **Appearance:** | Bomb body and tail painted grey/green or buff with a yellow stripe on the tail unit. Steel construction. |
| **Variants:** | 3 x variants. Kopfring nose for limited penetration. |



| | |
|---|---|
| Project | **Space Studios, Gorton** |
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| Report Ref: | **DRA-21-1283** |
| Info Source: | *W, Ramsey.1988 / various news sources* |

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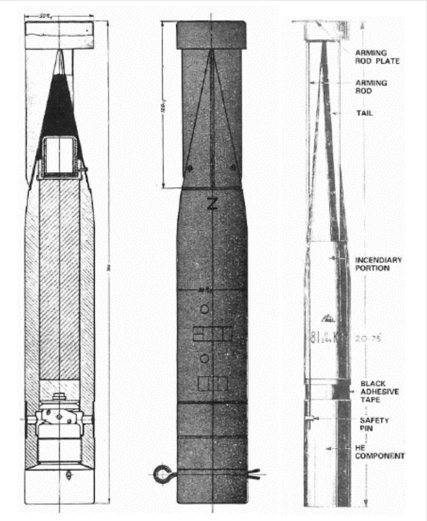
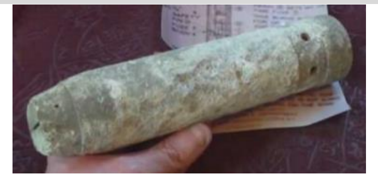
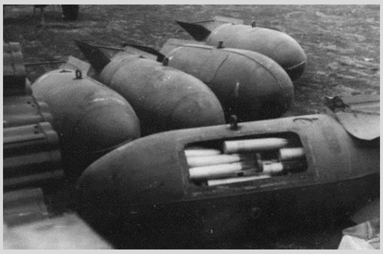
**Title:** German WWII Air-Delivered Munitions - Most Commonly Deployed Incendiary | **APPENDIX: 2.2**

## B-1E Sub-Munition

| | |
|---|---|
| **Bomb Weight:** | 1-1.3kg (2.2-2.87lb) |
| **Incendiary Weight:** | 680g (1.4lb) |
| **Filling:** | Thermite |
| **Fuse Type:** | Simple impact fuse |
| **Body Dimensions:** | 247mm length x 50mm diameter |
| **Appearance:** | Grey body and dark green painted tail unit. Magnesium alloy case. |
| **Operation:** | Small percussion charge ignites Thermite (>1,000°C burn). |
| **Variants:** | Most common variant: B 2EZ (2kg) included a small HE charge |
| **Remarks:** | Drop containers varied in size. The smallest cluster bomb held 36 x B-1Es and the largest 620 x B-1Es. |

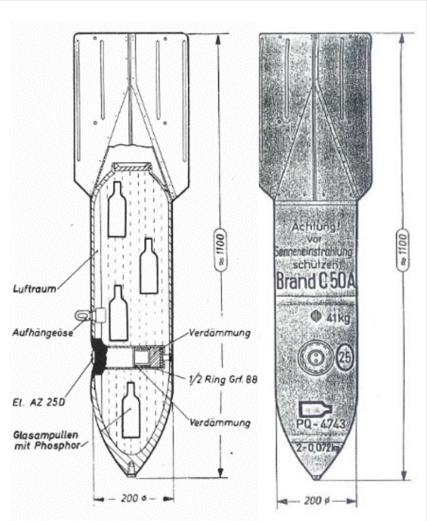

ARMING ROD PLATE
ARMING ROD
TAIL
INCENDIARY PORTION
20-75
BLACK ADHESIVE TAPE
SAFETY PIN
HE COMPONENT

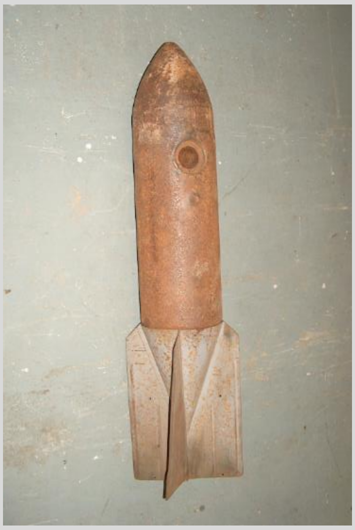




## Brand C50

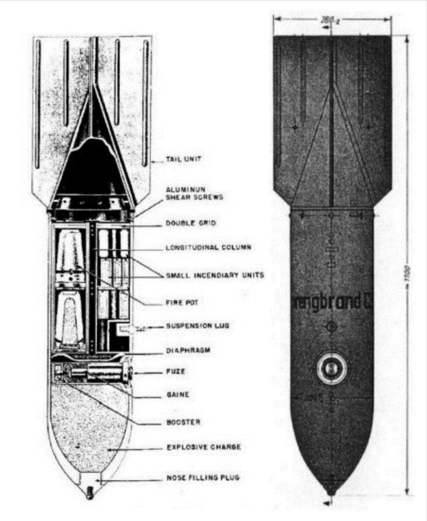
| | |
|---|---|
| **Bomb Weight:** | 41kg (90.4lb) |
| **Incendiary Weight:** | 13kg (30lb) |
| **Filling:** | Main fill (86% Benzine, 10% Rubber) plus 4% Phosphorus in glass bottles |
| **Fuse Type:** | 1 x electrical impact fuse |
| **Bomb Dimensions:** | 762mm length x 203mm diameter |
| **Appearance:** | bomb body and tail painted grey or green with the rear of the bomb painted red and a red band around the centre of the body. |
| **Variants:** | C 50 B: 77% White Phos fill<br>C 250 A: 87.7% Petroleum, 11.7% Polystyrene, 0.5% White Phos (185kg version) |

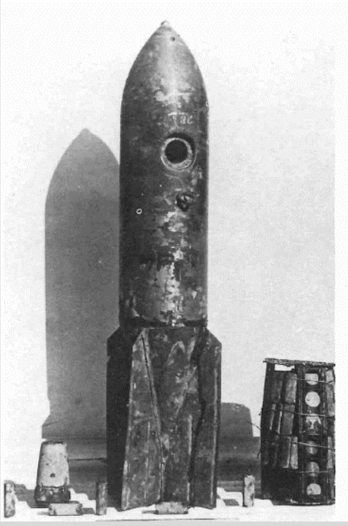

Luftraum
Aufhängeöse
Et. AZ 25D
Glasampullen mit Phosphor
Verdämmung
1/2 Ring Grf. 88
Verdämmung
≈ 1100
200 ⌀
Achtung! vor Sonneneinstrahlung schützen!
Brand C 50 A
41kg
25
PQ-4743
2-0,072kg
≈ 1100
200 ⌀



## Spreng-Brand C50 - *Fire Pot*

| | |
|---|---|
| **Bomb Weight:** | 34kg (75lb) |
| **Explosive Weight:** | 9kg (20lb) |
| **Filling:** | TNT burster charge, 6 x Thermite containers (fire pots) and 67 x small triangular incendiary elements. |
| **Fuse Type:** | 1 x electrical impact fuses or aerial burst fuse |
| **Bomb Dimensions:** | 711mm length x 203mm diameter |
| **Appearance:** | Bomb body and tail painted grey/green or pale blue with red base plug and red or green incendiary markings. Steel construction. |
| **Operation:** | A charge blows off the base plate, firing a plume of incendiary mixture 100 yds. Approx 1 second later the HE charge detonates. |


TAIL UNIT
ALUMINUN SHEAR SCREWS
DOUBLE GRID
LONGITUDINAL COLUMN
SMALL INCENDIARY UNITS
FIRE POT
SUSPENSION LUG
DIAPHRAGM
FUZE
GAINE
BOOSTER
EXPLOSIVE CHARGE
NOSE FILLING PLUG
280
1700
rengbrand C



| | |
|---|---|
| Project | **Space Studios, Gorton** |
| Client: | **IGE Consulting Ltd.** |
| Report Ref: | **DRA-21-1283** |
| Info Source: | *W, Ramsey.1988 / various news sources* |

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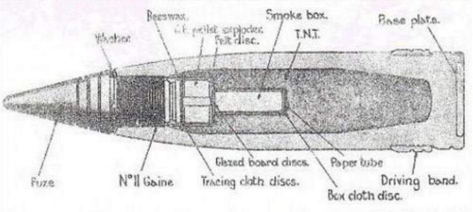
**Title:** British WWII Anti-Aircraft Munitions - Most Commonly Deployed **APPENDIX: 3**

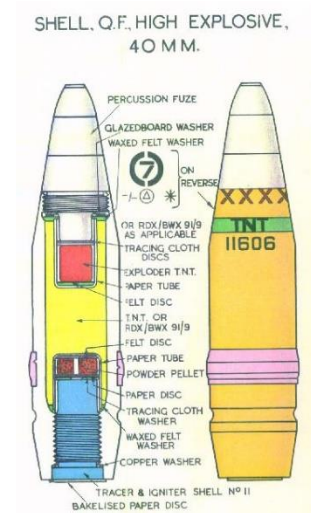
## HAA Battery - 3.7” QF Shell

| | |
|---|---|
| **Shell Weight:** | 12.7kg |
| **Shell Dimensions:** | 94mm x 438mm |
| **Fill Weight:** | 1.1kg |
| **Fill Type:** | TNT |
| **Fuse Type:** | Mechanical Time Delay fuse |
| **Appearance:** | Grey body, copper driving bands, brass neck |
| **Rate of Fire:** | 10 - 20 rpm |
| **Ceiling:** | 9,000 - 18,000m |
| **Variants:** | HE or shrapnel shells.<br>Note, the 4.5” gun was also used in an HAA role throughout the UK. |

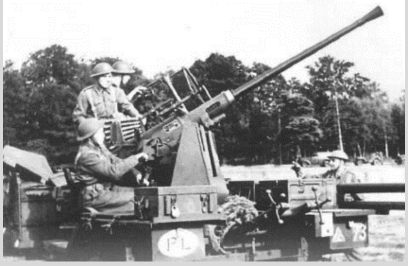

Beeswax.
Washer
C.E. pellet exploder.
Felt disc.
Smoke box.
T.N.T.
Base plate.
Fuze
N°II Gaine
Glazed board discs.
Tracing cloth discs.
Paper tube
Box cloth disc.
Driving band.

## LAA Battery - 40mm Bofors Shell

| | |
|---|---|
| **Shell Weight:** | 0.84kg |
| **Shell Dimensions:** | 40mm x 180mm |
| **Fill Weight:** | 70g |
| **Fill Type:** | TNT |
| **Fuse Type:** | Impact fuse |
| **Appearance:** | Grey body, copper driving bands, brass neck |
| **Rate of Fire:** | 120 rpm |
| **Ceiling:** | 7,000m |
| **Variants:** | HE or AP shells. Both with rear tracer compartment |

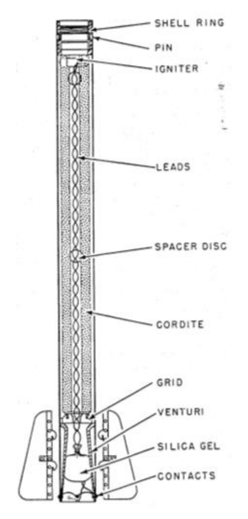

SHELL. Q.F., HIGH EXPLOSIVE,
40 MM.
PERCUSSION FUZE
GLAZEDBOARD WASHER
WAXED FELT WASHER
7
ON REVERSE
XXXX
TNT
11606
OR RDX/BWX 91/9 AS APPLICABLE
TRACING CLOTH DISCS
EXPLODER T.N.T.
PAPER TUBE
FELT DISC
T.N.T. OR RDX/BWX 91/9
FELT DISC
PAPER TUBE
POWDER PELLET
PAPER DISC
TRACING CLOTH WASHER
WAXED FELT WASHER
COPPER WASHER
TRACER & IGNITER SHELL Nº II
BAKELISED PAPER DISC

BATCH B 9705



## Z Battery - 3” U.P Rocket

| | |
|---|---|
| **Rocket Weight:** | 24.5kg |
| **Warhead Weight:** | 1.94kg |
| **Filling:** | TNT warhead. Black Powder solid fuel rocket motor. |
| **Fuse Type:** | Mechanical Time Delay fuse |
| **Rocket Dimensions:** | 1,930mm x 76mm |
| **Ceiling:** | 6,770m |
| **Operation:** | Fired from single, tandem and (later) 36 x rail launchers (Z Batteries). Limited use throughout the UK. |


SHELL RING
PIN
IGNITER
LEADS
SPACER DISC
CORDITE
GRID
VENTURI
SILICA GEL
CONTACTS

| | |
|---|---|
| Project | **Space Studios, Gorton** |
| Client: | **IGE Consulting Ltd.** |
| Report Ref: | **DRA-21-1283** |
| Info Source: | *W, Ramsey.1988 / various news sources* |

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Title: **Glossary** **APPENDIX: 4**

| | |
|---|---|
| AA | Anti-Aircraft (defences) |
| AFS | Auxiliary Fire Service |
| AP | Anti-Personnel |
| ARP | Air Raid Precautions |
| ASW | Anti-Submarine Warfare |
| BDU | Bomb Disposal Unit (historic term for EOD) |
| Bgl | Below Ground Level |
| EOC | Explosive Ordnance Clearance |
| EOD | Explosive Ordnance Disposal |
| FP | Fire Pot (German bomb) |
| GI | Ground Investigation |
| HAA | Heavy Anti-Air (gun battery) |
| Ha | Hectare (10,000m2) |
| HE | High Explosive |
| IB | Incendiary Bomb |
| Kg | Kilogram |
| LAA | Light Anti Air (gun battery) |
| LCC | London County Council |
| LRRB | Long Range Rocket Bomb (V2) |
| LSA | Land Service Ammunition |
| Luftwaffe | German Air Force |
| OB | Oil Bomb (German bomb) |
| PM | Parachute Mine (German bomb) |
| RAF | Royal Air Force |
| RFC | Royal Flying Corps |
| RN | Royal Navy (British) |
| RNAS | Royal Naval Air Service |
| ROF | Royal Ordnance Factory |
| SAA | Small Arms Ammunition |
| SD2 | 2kg AP bomb (German bomb) |
| SI | Site Investigation |
| U/C | Unclassified (German) bomb |
| UP | Unrotating Projectile (British 3” AA rocket) |
| USAAF | United States Army Air Force |
| UX | Unexploded |
| UXB | Unexploded Bomb |
| UXO | Unexploded Ordnance |
| V1 | German Flying (pilotless) bomb - “Doodlebug” |
| V2 | German LRRB - “Big Ben” |
| WAAF | Women’s Auxiliary Air Force |
| WWI | World War One |
| WWII | World War Two |

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